ISSN 0970-1915

Indian Journal of Clinical Biochemistry

Association of Clinical Biochemists of India

Abstract of the 47th National Conference of Association of Clinical Biochemists of India (ACBICON 2021)

Submit manuscripts at:
www.editorialmanager.com/ijcb

Springer

Indian Journal of Clinical Biochemistry

Official Journal of the Association of Clinical Biochemists of India

Aims and Scope

The primary mission of the journal is to promote improvement in the health and well being of community through the development and practice of clinical biochemistry and dissemination of knowledge and recent advances in this discipline among professionals, diagnostics industry, government and non-government organizations. Indian Journal of Clinical Biochemistry (IJCB) publishes peer reviewed articles that contribute to the existing knowledge in all fields of Clinical biochemistry, either experimental or theoretical, particularly deal with the applications of biochemistry, molecular biology, genetics, biotechnology, and immunology to the diagnosis, treatment, monitoring and prevention of human diseases. The articles published also include those covering the analytical and molecular diagnostic techniques, instrumentation, data processing, quality assurance and accreditation aspects of the clinical investigations in which chemistry has played a major role, or laboratory animal studies with biochemical and clinical relevance.

Copyright Information

For Authors

As soon as an article is accepted for publication, authors will be requested to assign copyright of the article (or to grant exclusive publication and dissemination rights) to the publisher (respective the owner if other than Springer Nature). This will ensure the widest possible protection and dissemination of information under copyright laws.

More information about copyright regulations for this journal is available at www.springer.com/12291

For Readers

While the advice and information in this journal is believed to be true and accurate at the date of its publication, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may have been made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, on video disks, etc., without first obtaining written permission from the publisher (respective the copyright owner if other than Springer Nature). The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

Springer Nature has partnered with Copyright Clearance Center's RightsLink service to offer a variety of options for reusing Springer Nature content. For permission to reuse our content please locate the material that you wish to use on link.springer.com or on springerimages.com and click on the permissions link or go to copyright.com and enter the title of the publication that you wish to use. For assistance in placing a permission request, Copyright Clearance Center can be contacted directly via phone: +1-855-239-3415, fax: +1-978-646-8600 or e-mail: info@copyright.com.

Journal Website

www.springer.com/12291
For the actual version of record please always check the online version of the publication.

Subscription Information

Indian Journal of Clinical Biochemistry is quarterly (January, April, July and October) publication of Association of Clinical Biochemists of India (ACBI). Subscriptions, address changes and claims should be sent to Springer Nature Customer Service Center: customerservice@springernature.com, Springer Nature Customer Service Center GmbH, Haberstraße 7, 69126 Heidelberg, Germany or Springer Nature Journal Fulfillment, Harborside Plaza II, 200 Hudson Street, Jersey City, NJ 07302, USA

ISSN: 0970-1915 print
ISSN: 0974-0422 electronic

Subscription Price

Subscription Rates: For India Rs. 6800 + 150 (Postage) and US$ 305 (International).

All correspondence regarding subscriptions within India should be addressed to: indianjournals.service@springer.com

Subscribers outside India may contact the Customer Care at the following e-mail addresses: customerservice@springer.com

Advertisements

E-mail contact: advertising@springer.com or manish.patil@springer.com

Disclaimer

Springer Nature publishes advertisements in this journal in reliance upon the responsibility of the advertiser to comply with all legal requirements relating to the marketing and sale of products or services advertised. Springer Nature and the editors are not responsible for claims made in the advertisements published in the journal. The appearance of advertisements in Springer Nature publications does not constitute endorsement, implied or intended, of the product advertised or the claims made for it by the advertiser.

Office of Publication

Springer (India) Private Ltd.,
7th Floor, Vijaya Building,
17, Barakhamba Road,
New Delhi 110 001, India

Publisher

Association of Clinical Biochemists of India (ACBI), Biochem Lab, East Boring Canal Road, Patna-800001 (India), E-mail: kpsacbi@yahoo.co.in, Phone & Fax: +91- 612-2531212, Website: www.acbindia.org

Distributor

Springer (India) Private Limited, 7th Floor, Vijaya Building, 17, Barakhamba Road, New Delhi 110 001 (India), E-mail: naren.aggarwal@springer.com, Indianjournals.service@springer.com, Direct: +91-11-4575 5815, Board: +91-11-4575 5888 (Extn, 815), Fax: +91-11-4575 5889, Mobile: +91-9910449496, Website: www.springer.com

Submission of Manuscripts

Please log directly onto the site https://www.editorialmanager.com/ijcb and upload your manuscript following the on-screen instructions.

Ownership/Distribution Rights

Springer (India) Private Limited (www.springer.com) has exclusive rights and license to electronically publish and distribute the Springer Link Edition of the journal, and distribute the Print Edition of the journal worldwide.

Ind J Clin Biochem (2021) (Suppl 1)
https://doi.org/10.1007/s12291-021-01019-3

ISSN 0970-1915

IJCB

Volume 36 · Supplement 1 · December 2021

Indian Journal of
Clinical
Biochemistry

12291

Official Journal of the Association of Clinical Biochemists of India

Contents

Awadhesh Saran Memorial Oration Award

Hepatitis C Virus: Life in the liver

Saumitra Das

National Institute of Biomedical Genomics, Kalyani
Department of Microbiology and Cell Biology, Indian Institute of Science, Bangalore

Liver is the home for hepatitis viruses, where they multiply and cause tissue damage. What controls their life within the liver is our primary research interest. The major cause of viral hepatitis is the infection by several subtypes of hepatotrophic viruses–viz. Hepatitis A, B, C, D and E viruses. Our laboratory primarily focuses on the hepatitis C virus (HCV) infection, which causes liver cirrhosis and often leads to hepatocellular carcinoma. HCV is a single-stranded RNA virus which upon infection releases its positive stand RNA genome into the host cytoplasm. Following entry into the liver cells, translation of the viral RNA is the initial obligatory step for viral replication. The viral RNA translation is mediated by an 'internal ribosome entry site' (IRES) element present at the 5'-untranslated region of the RNA template. Ribosome binding to the HCV-IRES element is unique and fundamentally different from the cellular mRNA. It is influenced by several *trans*-acting host proteins and *cis*-acting elements on the HCV RNA. HCV manipulates the host machinery to replicate successfully. We have been deciphering the molecular mechanisms of HCV life cycle and pathogenesis that involves the viral as well as host factors (proteins and RNAs) in the liver. These key players are being exploited for rational designing of antiviral agents that can inhibit different steps of HCV infection. In parallel, we have developed a candidate vaccine against HCV, customized for Indian population. Our journey towards understanding the Biology of Hepatitis C virus in past two decades will be discussed.

Dr. T. N. Pattabiraman Oration Award

Proficiency Testing - Purpose and Perspective

Shyamali Pal

JMD Diagnostics Private Limited
P-336, C I T Road Scheme VIM, Kolkata-700054
M: 9874415344; email: shy23_pal@yahoo.co.in

Objective: The objective of proficiency testing (PT) is to assess the comparability of results of one independent laboratory with other laboratories based on common criteria. Such criteria ideally should consist of evaluation of a common sample based on similar characteristic features considering the allowable deviations due to variables as standard practice.

The PT performance can only be considered ideal when
I) Pre analytical, analytical, and post analytical procedures are all in accordance.
ii) The matrix should mimic regular procedure.
iii) The PT assessment plan would follow ISO13528:2015 giving advantage of evaluation to laboratories performing uncommon methods.

Methodology:
Sample preparation and packaging:
1. Collection of samples and to prepare master pool.
2. Confirmation of absence of Infective hepatitis markers& HIVI, HIVII, P24 antigen.
3. Generation of UID for every participant.
4. Preparation of sample pool for the participants.
5. Packing of samples in such a manner that temperature remains within 2-8C

Sample transport:
1. To record the temperature before sending the sample.
2. To dispatch in insulated box.

Release of result:
1. Assigned mean, Robust SD, uncertainty etc. are determined from consensus values.
2. Laboratory result is validated as per the guideline

Statistical Calculation:
As per ISO17043:2010 & ISO13528:2015

Results and discussion:
The concept of PT till date is based on analytical phase. Two major areas namely matrix & consideration of all phases has been explored less. The use of master pool

from human sample satisfies the criteria of matching of matrix. Ideally PT is distance monitoring, so pre analytical phase was monitored by creating determinants. The accumulated results showed distance and time stability of such pooled samples. As outsourcing is common practice in the present days so such sample stability result is of help to determine the validity of such outsourced results. The standard practice of PT is to assign the mean within peer group. The aim is to minimize CV%. But total allowable error (TEA) as per CLIA guideline is universally acceptable. Hence, instead of minimizing CV% comparison of results as per method specification seems to be a better approach. The approach does justice to the comparative study of a smaller number of participants.

Conclusion: The concept of PT needs amendment as per requirements of laboratory practice.

K.L. Gupta Memorial Oration

Recent advances in cancer diagnosis and precision medicine

Mammen Chandy

Director, Tata Medical Center, Kolkata.

The discovery of the Philadelphia Chromosome in Chronic Myeloid Leukemia (CML) in 1960 and the subsequent understanding that this was a reciprocal translocation of the bcr gene on chromosome 9 to the abl gene on chromosome 22 resulting in constitutive upregulation of a tyrosine kinase with multiple downstream effects, with uncontrolled proliferation of myeloid cells, led to the introduction of imatinib, which by binding to the ATP groove of the new bcr-abl gene switches it off and allows the patient to live a normal life on a single pill a day. This has transformed the way we diagnose, monitor and treat CML. Diagnosis today is by fluorescent in situ hybridization (FISH) and monitoring is by real-time PCR (RT-PCR) of the bcr-abl transcript levels. Resistance to the therapy is studied by sequencing of the bcr-abl gene and based on the mutation, the next generation of tyrosine kinase is started. In 40% of patients with sustained molecular response a treatment free remission can be obtained (TFR). This is now the paradigm of precision medicine in the management of cancer. The drugs of the future will be based on the understanding of the molecular pathways that have been altered by the mutations in the cancer cell and switching off these pathways to control the malignancy. The introduction of next generation sequence-based testing allows us to target a whole set of mutations in a given patient with acute myeloid leukemia and tailor the therapy based on the mutational landscape.

Targeting the antigens which have been documented to be present on the tumour cell by immunohistochemistry or flowcytometry increases the precision of pathological diagnosis and has opened a whole new way of treating cancer by modulation of the immune system with check point blockade and an array of humanized monoclonal antibodies, plain, conjugated with toxins or T cell engagers (BITES).

Non-invasive methods to monitor disease control based on the mutation, by doing real time droplet-based PCR (DDPCR) in the circulating DNA in the patients' blood are being developed and therapy can be changed when a new mutation is detected.

The oncologist has to understand this new era of molecular medicine and use these tools wisely based on the socioeconomic status of the patient. Basic scientists need to further explore the metabolic pathways that have been switched on in the different mutations present in cancer cells and develop small molecules which target specific points in the downstream pathways which result in proliferation and failure of differentiation causing cancer

Mrs. & Dr G. P. Talwar Oration

Genomics of Immune-Response to Typhoid and Cholera Vaccines

Partha P. Majumder

National Science Chair, Govt. of India
&
Distinguished Professor, National Institute of Biomedical Genomics, Kalyani

To assess the role of genomic factors associated with immunological response to typhoid and cholera vaccines, we have conducted two large studies in India.

Typhoid: Significant associations of response with SNPs in 7 genes (*DEFB1, TLR1, IL1RL1, CTLA4, MAPK8, CD86*, *IL17D*) were discovered and cross-validated. These genes are involved in polysaccharide recognition, signal transduction, inhibition of T-cell

proliferation, pro-inflammatory signaling and eventual production of antimicrobial peptides.

Cholera: Significant associations of SNPs and haplotypes in three genes (*MARCO, TNFAIP3, CXCL12*) with response were discovered and validated. LPS, present in the vaccine, is a potent activator of innate immune responses and a ligand of MARCO. *CXCL12* is a neutrophil and lymphocyte chemoattractant that is upregulated in response to V. cholerae infection. LPS in the vaccine possibly provides signals that mimic those of the live bacterium. *TNFAIP3* promotes intestinal epithelial barrier integrity and provides tight junction protein regulation; possible requirements for adequate vaccine-response.

Seth G.S. Medical College & K.E.M. Hospital Oration

Clinical Chemistry & Immunoassay Test Results: Harmonisation and Standardization of Discordant Notes

Barnali Das

Consultant, Biochemistry & Immunology,
Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute, Mumbai, India
Executive Member, Scientific Division, International Federation of Clinical Chemistry& Laboratory Medicine (IFCC).
Chair, American Association of Clinical Chemistry (AACC) India Section.

Clinical Chemistry and Immunoassay tests form a very important set of tests in a laboratory; a tool that clinicians and patients alike depend on, to pin down the symptoms for treatment and relief.

However, it is this very set of tests that have come in question. First, what is the normal and acceptable range (upper & lower limits) of different Clinical Chemistry and Immunoassay biomarkers in a particular population has been debated in different scientific fora. This is because the level of markers can change in relation to other biochemicals, biomolecules and hormones, which themselves vary considerably with race, gender, age, different physiological conditions (like pregnancy, new-born) and other illnesses & interfering substances. The variation can be to an extent that each individual can seem to have their own set-point of these parameters.

A second problem which the diagnosticians have to grapple with is the variability of test-results in itself; even a broadly similar set of instruments and methods can provide variable results. It is then a real challenge to physicians, to decide whether the patient is suffering from a disease or not, since other factors can also cause changes in test levels.

Standardization and harmonization of clinical chemistry and immunoassay testingis therefore still a formidable challenge, due to the lack of proper reference intervals and sometimes due to standardized measurement procedures. Laboratory medicine community the world over has realized that, variability in test results in different platforms can create a lot of confusion to clinicians and the general population; harmonization of procedures is therefore the need of the hour. In this talk, I will provide few examples and technical solutions to address laboratory challenges and to take it forward from both Clinical Chemistry as well as Immunoassay platforms.

To begin with, harmonization and standardization of TSH and other thyroid function tests are still a formidable challenge, due to the lack of proper reference intervals and standardized measurement procedures. It has been documented that even a broadly similar set of instruments and methods can give up to 40% more or less values in TSH levels.

Based on a particular population's demographic variations, reference interval can be different for immunoassay like TSH. Therefore, we have verified the reference interval for the Indian population for TSH in our laboratory. We have screened 800 subjects, of which 630 healthy subjects were chosen in the study group for reference interval verification.

The reference interval (90% Confidence interval) for TSH by non-parametric procedure (bootstrap) was 0.48-4.52, and by parametric one (after transformation of the data) was 0.45-4.27 for the adult population, which is little different from the manufacturer's guidelines.

Similarly, we have conducted a study of 2797 female patients and 2805 male patients in a six month period and have observed that, women have a greater risk of being 14% under-diagnosed of acute coronary syndrome, if we donot use gender specific cut off (Male: 32.3 pg/ml and Female: 14.6pg/ml for the Indian population), with high sensitive troponin I assay near the 99th percentile of a reference control population.

Therefore, implementation of sex-specific hs-cTnI assay was able to identify 14% of under-diagnosed women with ACS in 6 months period. This in turn also decreased the number of men being diagnosed by 3%.

On a similar note, there has been a continuous challenge in the health care system in U.S, Europe and other countries to standardize and harmonize the HbA1c reporting: the decision on what to report in NGSP (%) and/or IFCC (mmol/mol) units along with eAG (in either mmol/L or mg/dL). This globalization places a responsibility on laboratory medicine specialists to work together to reduce the current variability in patient results, which arises from differences between units, methods and laboratory practices in different countries.

Due to the standardization efforts of IFCC, NGSP, and also due to ongoing efforts of manufacturers and laboratories, the quality of HbA1c reporting has increased dramatically. Consequently, there has been a paradigm shift: HbA1c is now considered the gold standard, not only for monitoring, but also for diagnosis of diabetes. We have performed verification studies of HbA1c by different methods: HPLC, Capillary Electrophoresis, Enzymatic, Immunoassays in 200 samples and compared 60 samples with hemoglobinopathies.

Finally, we have also explored harmonizing the clinical protocol based on the use of inflammatory and routine laboratory biomarkers in 2,654 COVID-19 patients. To explain the role of harmonizing routine laboratory parameters in disease monitoring, two adult males, two adult females and one adolescent girl were selected. These are representative examples of different manifestations of COVID 19, with Adult Respiratory Distress Syndrome (ARDS), Cardiac Injury, Neurological manifestations and Pediatric Multi system inflammatory syndrome (PIMS), admitted in the Intensive care unit (ICU) of the hospital, which will be discussed.

Therefore, the road map for laboratory medicine will involve strategies for harmonizing, communicating and integrating with all stakeholders, like, clinicians, diagnosticians and IVD industry, in order to formulate guidelines for assisting in correct measurement, diagnosis and management of diseases.

Dr. Tarnath Shetty Memorial Oration Award Popular Lecture Series

Personalized medicine: An overview

Suhrita Paul

Vice Chancellor,
The West Bengal University of Health Sciences

Large collaborative research projects (Human Genome Project) explain the roles of genes in normal human development and physiology and reveal single nucleotide polymorphisms (SNPs) that account for some of the genetic variability between individuals.This led to genome-wide association studies to examine genetic variation and risk for many common diseases and variability in drug response by individuals. Personalised Medicine (PM) is the dividend of Human Genome Project: an extension of traditional approaches in which molecular screenings combined with clinical data will point to more precise treatment options for individual patientlike optimisation of therapy, increase safety and efficacy, decrease adverse drug reactions, enhance patient compliance, reduce cost, time and clinical trials failure rate. The vision of PM is to provide 'the right drug, with the right dose at the right time to the right patient'. The United States Congress defines Personalised Medicine as the application of genomic and molecular data to better target the delivery of health care, facilitate the discovery and clinical testing of new products, and help determine a person's predisposition to a particular disease or condition. It is an emerging practice of medicine that takes the help of evidence based medicine by using an individual's genetic profile to guide decisions made in regard to the prevention, diagnosis, and treatment of various diseases like cancers, Alzheimer, Hepatitis, Cardiac diseases etc. Scientific, economic and regulatory challenges remain to be addressed following which Physicians can go beyond the one-size-fits-all model of prescribing to make more effective Tailor made clinical decisions for each patient.

IL-1

Laboratory Diagnostics in COVID-19

Rahuldeb Sarkar

Medway NHS Foundation Trust, King's College London

Multiple laboratory parameters have been proposed for use in the diagnosis and prognosis in COVID-19. They are useful as prognostic factors, in choosing certain therapeutic agents and in determining trophism of the disease in particular organ systems or particular inflammatory syndrome like secondary hemophagocytic lymphohistiocytosis (S-HLH).

"ISARIC 4C" score, using 8 variables, including 2 laboratory markers (CRP and urea) is used in predicting disease outcome. However, to capture nuances in disease behaviour, wider biomarker assessment is required. D-dimer, Lactate dehydrogenase, Ferritin all represented disease severity. Procalcitonin can differentiate bacterial infection from inflammation. Troponin has been associated with mortality in patients with and without underlying coronary artery disease. This is also associated with myocarditis. IL-6 and CRP (cut-off>75mg/dL in RECOVERY trial) has been used in selecting patients for Tocilizumab. Ferritin has been shown to predict Methyl Prednisolone response and in identifying S-HLH. Neutrophil:Lymphocytic ratio and Red Cell Distribution Width (RDW) trajectory have been shown to be useful predictor of disease outcome. Circulatory histone has been shown to play important role in COVID-associated coagulopathy and mortality. In ISARIC study, multiple markers (GM-CSF, CCL-4, CXCL 10)have been shown to have role in prognostication. Genomic study showed strong genetic predisposition towards mortality in critically ill patients, suggesting accurate prognostication is impossible without genetic data.

Given that multiple laboratory parameters have role in COVID-19 in variable degree, there is a need for a holistic view of the patients, keeping in mind their demographic and physiological factors and also the subtle interplay between different laboratory features.

Key words: COVID-19, ISARIC 4C, laboratory markers

IL-2

Genomic Variation Underlies the Severity of Covid-19 Clinical Manifestation in Individuals of European Descent

Priyanka Upadhyai[1], Gokul Suresh[2], Rahul Parit[1] and Ranajit Das[2]

[1]*Department of Medical Genetics, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India*
[2]*Yenepoya Research Centre, Yenepoya (Deemed to be University), Mangalore, Karnataka,India*

Background: The coronavirus disease (COVID-19) caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is characterised by a wide spectrum of clinical phenotypes ranging in acuteness from asymptomatic, symptomatic with mild or moderate manifestation and severe involving pneumonia and respiratory distress. COVID-19 susceptibility, severity and recovery have demonstrated high variability worldwide. Variances in the host genetic architecture may potentially control the inter-individual and population scale differences in COVID-19 presentation. Methods: We performed a genome-wide association study (GWAS) employing the genotyping data from Ancestry DNA COVID-19 host genetic study that included COVID-19 positive patients and healthy individuals who had tested negative for SARS-CoV-2 infection at the time of recruitment. We restricted our analysis only to the individuals of European descents to avoid genetic structure in the dataset, arising due to the presence of people from different ancestries. Further, we uniquely employed the asymptomatic individuals as controls instead of healthy individuals. Results and Discussion: Our data revealed striking genomic differences between COVID-19 asymptomatic and severely symptomatic individuals. We identified 621 genetic variants that were significantly distinct (Multiple-testing corrected P<0.001) between

asymptomatic and acutely symptomatic COVID-19 patients. These variants were found to be associated with pathways governing host immunity, such as innate and adaptive immune system, interferon signaling, interleukin signaling, antigen processing by MHC, cytokine signaling and known COVID-19 comorbidities, such as obesity, cholesterol metabolism and smoking. Variants modulating drug responses including to anti-retroviral agents were also found to vary significantly between asymptomatic and severe patient groups.

Keywords: COVID19, GWAS, Genomics, Ancestry

IL-3

Cytokine Storm in Severe COVID-19: Does Remdesivir/ Tocilizumab Improve Clinical Outcome?

Sohini Sengupta, Anil Handoo,
Rajesh Pande, RK Kapoor

Department of Clinical Biochemistry, Laboratory Services & Critical Care Medicine,
BLK-MAX Super Speciality Hospital, Delhi, India.
Email id: drsohini9@gmail.com

Objective: To study correlation of age, gender, serum IL-6 & D-dimer value (on admission), and impact of Tocilizumab (immunomodulator)/ Remdesivir (antiviral) therapy on clinical outcome (28-day mortality), in severe COVID-19. Methodology: Confirmed cases of severe COVID-19 (ICMR/ WHO criteria), admitted in the COVID-ICU were included. Venous plasma samples were collected within 6 hours of admission on day 1 for measurement of IL-6 and D-dimer and analyzed within 2 hours. Demographic characteristics, laboratory tests and therapeutic interventions were recorded. Results: The incidence of death was significantly higher in males above fifty years. The mortality rate correlated with increasing values of IL-6 (highest at levels >70 pg/mL. D-dimer values above 0.5µg FEU/mL were associated with increased risk of poor outcome. 85.3% of patients treated with Remdesivir showed clinical improvement. When Tocilizumab and Remdisivir were administered together, 44.0% of patients survived while 56% expired. Conclusion: Men above fifty years were most vulnerable to a poor outcome. Higher levels of IL-6 and D-dimer correlated with increased mortality. Both these biomarkers may be estimated on admission, and serially thereafter, to guide clinicians in recognizing patients with severe COVID-19 early in the disease course, and monitor prognosis. Remdesivir improved clinical outcome. The mortality rate was higher when Remdesivir and Tocilizumab were administered together.

Keywords: Cytokine storm, immunomodulators, antivirals, COVID-19

IL-4

Precision Diagnosis and Personalised Cancer Treatment

D Raghunadharao

Chief medical Oncologists, KIMS ICON Hospital, Visakhapatnam

Cancer is a heterogenous disease. Its diagnosis and treatment largely rely on a morphological diagnosis (histological or cytological). Tumour morphology is the phenotypic expression of the genetic or epigenetic change (s) that induces, sustain and help its metastasis.

Outcomes from existing therapies like surgery, radiation or chemotherapy do help in the cure or control of cancer, but, at the cost of severe toxicity to the normal tissues and organ systems.

Recognising the genetic changes or switches - driver mutation, the pathways that are thence activated, and mechanisms that help the cancer cell escape immune detection have led to the design of newer modalities to combat cancer. The diagnosis goes beyond basic morphology, through cytogenetic profiling, immunohistochemistry, flow cytometry, to molecular or genetic profiling of the tumour. The treatments designed to target such changes are therefore expected to be less toxic to the normal tissue, with much less off target

toxicity.

Precision diagnostics has largely been driven through adaptations of new information flowing from systems biology, biochemistry, medical physics, radiobiology and *in silico* testing. Refinements in instrumentation have fuelled the sensitivity of several tests.

Technological advances now allow the rapid sequencing of the tumour genome, creating libraries of common and variant mutations that predispose to, as well as sustain a cancer cell, allow it to metastasize, escape immune detection and mutate spontaneously or treatment induced stress.

We have also understood that the differences in the ability of the human body to metabolise xenotoxins or carcinogens underlies the differences in individual susceptibility to the same carcinogen - endogenous as well as environmental.

Simple to complex patterns of polymorphisms in metabolising enzymes are also responsible for racial, regional or individual variation in response to cancer therapies, including profound toxicity.

Progress made in the fields of basic and applied sciences of biology, physics, chemistry and information technology have enabled us to dive deep into understanding how cancer is caused. Such advances at the sub-cellular and molecular level have not only given us extraordinarily precise diagnostic tools to pin-point what could be wrong, but has also empowered us to seek tools to prevent and treat it. Progress in cancer biology and immunology has enabled us to equip the body prevent certain virus induced cancers: for example, vaccination against the Human Papilloma Virus to prevent cervical, genital and oropharyngeal cancers and against Hepatitis B Virus to prevent cirrhosis of the liver and subsequent liver cancer.

Using precision diagnostics like PET-CT Scans, we can now map cancer spread and the response to treatment very precisely. We can now target the 'driver mutations' that induce and sustain cancers – switching them off to stop the cancers from growing and finally disappearing.

An ability to detect minute traces of disease, using molecular tests like RT-PCR and next generation sequencing, has helped us to discontinue treatment in such diseases like chronic myeloid leukaemia and limit therapy in several blood cancers and childhood cancers.

Advances in treatment include personalisation of cancer treatment, tailored to the driver mutation of every single patient, thus avoiding collateral toxicity to normal organs and tissues that do not share the cancer causing gene. Such treatments include several 'mabs& nibs', antibody drug conjugates as well as 'precision bombing' using radionuclide tagged drugs and antibody drug conjugates.

Artificial intelligence and robotics have helped the surgeon and radiation oncologists execute several hitherto-impossible surgeries and radiation protocols that improve cure rates while limiting resection or exposure of normal tissue to radiation, respectively.

We are now able to bring several advanced cancers under the ambit of prolonged control with good quality of life. This is made possible with a combination of multidisciplinary team of experts opining on a personalised road map for the diagnosis, treatment and follow up of the patient-surgeons, radiation oncologists, medical oncologists, nuclear medicine specialists, radiologists, physicists, anaesthesiologists, pathologists, cancer nurses, cancer pharmacists and physiotherapists-all working towards the cancer patient's seamless management.

IL-5

Early Detection of Cancer by Nanotechnology

P D Gupta

Former Director grade Scientist, CCMB, Hyderabad. India

Jaishree Vaijanathappa, Professor & Head, JSS Academy of Higher Education and Research, Mauritius.

Cancers can be managed effectively if they are directed at an early stage. Recently developed nanotechniques help more accurately to detect them. Almost all organs in the human body can become cancerous except a few. The causes of cancer may still be obscure or may have multiple origins. Most of the scientists have branded it as lifestyle disease, however this hypothesis cannot hold worthy in childhood cancers.While others are for its genetic origin a few favours its epigenetic origin: Cancer genes were isolated

and identified, for example, BRCA1 and BRCA2 were associate with breast cancer, nevertheless many epidemiological studies pointing towards the longer exposure of white light is the main cause for the prevalence of breast cancer. To manage such a multi facet dreadful disease—cancer, we need a more powerful multifunctional, fast and accurate technology-the nanotechnology which can attack it from all directions. Nanotechnology covers a vast and diverse array of devices derived from engineering, biology, physics and chemistry. These devices include nanovectors for the targeted delivery of anticancer drugs and imaging contrast agents. For nanodiagnostics biologically targeted nanosized magnetic resonance imaging (MRI) contrast agents for intra operative imaging in the context of neuro oncological interventions. Novel, nanoparticle based methods for high-specificity detection of DNA and protein, as our team have developed 2ng sensitive protein detection by using fluorescent dye Eosin Y. Nanowires and nanocantilever arrays are among the leading approaches under development for the early detection of precancerous and malignant lesions from biological fluids. These and other nanodevices can provide essential breakthroughs in the fight against cancer. Nanovector, a hollow or solid structure, with diameter in the 1-1,000 nanometre range, which can be filled with anticancer drugs in injectable form can be injected at the cancer site for cure as well for and detection if filled with tracing agents. Targeting moieties can also be attached to the surface. Nanovectors can be used for targeted gene therapy. Liposome, a type of nanovector made of lipids surrounding a water core. The development of novel mathematical and computational models will be required to reap the full rewards of the deployment of nanotechnology in the management of cancer.

IL-6

Epigenetic Signature of Active Methylation in the Hypoxic Niche of Gliomas

Pankaj Prasad[1], Shivani Arora Mittal[1], Jonita Chongtham[1], Ashish Bhushan[1], Shruti Khanna[1], Sanchit Gandhi[1], Sujata Mohanty[2], Tapasya Srivastava[1]

[1]*Department of Genetics, University of Delhi South Campus, New Delhi-110021*
[2]*Stem Cell lab, All India Institute of Medical Sciences*

Activation of pluripotency regulatory circuit is an important event in solid tumor progression and the hypoxic microenvironment is known to enhance the stemness feature of some cells. The distinct population of cancer stem cells (CSCs)/tumor initiating cells exist in a niche.CSCs significantly augment chemoresistance and poor prognosis. Our lab has demonstrated a role of hypoxia-mediated epigenetic modifications in regulating expression of core pluripotency factors, OCT4 and NANOG, in glioma cells. Our work shows hypoxia-mediated induction of demethylases, ten-eleven-translocation (TET) 1 and 3, but not TET2 in our cell-line model. Immunoprecipitation studies reveal active demethylation and direct binding of TET1 and 3 at the *Oct4* and *Nanog*regulatory regions. Knockdown of *Tet1* and *Tet3*inhibited the formation of neurospheres in hypoxic conditions. We observed independent roles of TET1 and TET3 in regulating pluripotency, lineage-commitment and differentiation associated genes in hypoxia. We have taken this work forward to identify expression of genes pertinent in hypoxia and regulated by TET1 and TET3. Protein coding and non-coding genes that either regulate or are part of key biological networks are being explored. We are currently attempting to decipher relevant pathways which can be targeted for therapy.

IL-7

Comparing the Quality and Yield of gDNA from Urine and Oral Samples: A Quest for a More Acceptable Biological Sample for HPV DNA assay

Mingma Lhamu Sherpa[1], Bhudev C Das[2], Shazia Rashid[2], Chamma Gupta[1], Yazum Bhutia[1], Pesona Grace Lucksom[3]

[1]*Department of Biochemistry,* [3]*Department of Obstetrics & Gynaecology*
Sikkim Manipal Institute of Medical Sciences, Sikkim Manipal University, Gangtok, Sikkim-737102, India,
[2]*Amity University Uttar Pradesh, Sector-125, Noida, India-201313*
mingmals@yahoo.com

Introduction: Cervical and Oral Cancer, have been associated with infection with high risk Human Papillomavirus (hr-HPV). Urine and oral gargle samples are emerging as analternative source of HPV DNA to cervical smears. The study comparedmanual method of gDNA extraction from both samples for HPV DNA genotyping and compared it against Siha Cancer cell line for HPV DNA 16 expression. Materials and methods: gDNA was extracted from 400 Urine and oral samples Phenol, Chloroform method,and DNA integrity of isolated DNA were analyzed by standard methods. The DNA integrity was also analyzed in qPCR amplification for housekeeping human *β*-globin gene in replicates. HPV genotype was determined in urine and oral sampleswith positive control from *Siha* cancer cell line using AmpliSens*β-globin* IC based HPV genotype-FRT Real Time PCR. Result: Adequate DNA quantity and purity with average A 260/280 ratios of 1.77 and 1.72 for gDNA from urine and oral samples, respectively. The mean DNA yield(ng/µl) were657.43 for urine and 1140.94 oral samples. The meanCqfor *β-globin* in gDNAwere12.76 and 18.53 respectively.HPV type 16 was successfully amplified in *Siha* positive control in Real time PCR.hr-HPVincluding 16 were 14 % in urine and 3.5 % in oral samples. Conclusion: Oral gargle and urine may be used for DNA extraction for HPV assay by RTPCR with equivocal yield of gDNA from urine and oral samples. Detection of *β-globin*, IC with Cq value below 30 established sufficiency and pure quality of extracted gDNA from urine and oral gargle samples. Adequate and pure form of gDNA can be obtained from urine and oral samples using standardized manual DNA extraction protocols.

Keywords: HPV DNA,Urine, Oral, manual DNA extraction, *β-globin*,*Siha,*qPCR.

Acknowledgement: This study was a by-product of a technology transfer project funded by ICMR, ID number 79/7 NE/ Proj/2016/NCD-III and Capacity building DBT funded Institutional Biotech Hub project, ID-BT/04/NE/2009

IL-8

Genetics and Genomics of Neurological Disorders for precision Medicine

Mohammed Faruq

CSIR-Institute of Genomics and Integrative Biology, Dlehi-110007

Neurodegenerative diseases represent a significant group of health ailments which requires attention throughout the different phases of life. These include Alzheimer disease, Parkinson's disease, motor neuron disease, hereditary ataxia, Charcot Marie Tooth disease etc. It is such that some of these neurological disorders are congenital in onset and have a strong genetic basis at large, while others and prevalent ones follow complex etiologies, yet, single gene defects are known to cause adult and late age at onset neurogenetic diseases.

Our lab has gained a significant experience in dealing with genetic and molecular aspect of neurogenetic ailments particularly hereditary ataxias. We have deployed an integrative clinical genetic approach to identify and do genetic defect mapping in Indian cohort of cerebellar ataxias in collaboration with major tertiary referral centres. Through our extensive use of advance molecular tools, we are able to demonstrate that a significant percentage of cerebellar ataxia can be

ascribed a genetic etiology. We observed that nearly 40-50% of ataxia cases of varying onset have genetic etiologies. We have observed that SCA2 and SCA12 are the commonest SCA subtype identified from India, while other rare subtypes as well have been identified using whole exome sequencing and functional molecular dissection. In a similar way, the genetics of other neurodegenerative diseases have been dealt with for Indian patients with motor neuron disease, hereditary spastic paraplegia and Charcot Marie tooth disease and muscular dystrophies. Our multiple studies in this area have provided information regarding the genetic spectrum of these disorders and give an opportunity for novel gene discoveries.

An approach of interdisciplinary nature involving clinics, genetics and basic science is adoptable in different laboratories/institutes across the country with involvement of all the stakeholders. This would certainly pave the way for achieving precision medicine in the country for neurological disorders.

IL-9

How Genetics Can Unravel the Biological Basis of Dyslexia

Subrata Sinha

Dept of Biochemistry, AIIMS, New Delhi; sub_sinha@hotmail.com

Specific learning disabilities, like dyslexia or dyscalculia, are conditions where a particular function is affected ,while globally, neurological functions are preserved. Dyslexia is a difficulty in reading and writing, despite normal intelligence and adequate social and educational opportunity. Learning disabilities are complex in nature and result from gene environment interactions that may involve multiple genes. Many isolated genetic predispositions have been identified, though associations that affect a significant proportion of the population are not really evident. India, with its highly endogamous populations, provides a unique opportunity for studying inherited conditions. We had studied three extended multi-generational families from endogamous groups that had a high incidence of dyslexia. All three had different patterns of inheritance, indication that dyslexia may be a common manifestation of different molecular aberrations. The pathways involved neuronal differentiation; cadherin mediated cell to cell contact and GABAergic pathways. A novel pathway of neruronal differentiation from human neural progenitor cells will be described.

Acknowledgement: This work was initiated at NBRC and is continuing at both the institutions.

IL-10

Biomarkers in AKI: Current Scenario

Sandeep Mahajan

Department of Nephrology, AIIMS, New Delhi
mahajansn@gmail.com

Acute kidney injury (AKI) is defined by a rapid increase in serum creatinine, decrease in urine output, or both. AKI occurs in approximately 10–15% of patients admitted to hospital, while its incidence in intensive care has been reported to bemore than 50%. It is a life-threatening illness that continues to have an in-hospital mortality rate ranging from 20% to 50% or greater, depending on underlying conditions, which has only marginally declined over the past 25 years inspite of overall improvement in health care. Late diagnosis of AKI by the current markers is considered to be a major limitation in planning research and clinical interventions to improve outcomes in these patients. Biomarkers of kidney injury are new tools for risk assessment and could possibly guide therapy. Various AKI bio-markers have been discovered and validated to improve timely detection, differentiation and stratification into risk groups for progressive renal decline, need for renal replacement therapy or death. However, in addition to facilitating more timely intervention, AKI biomarkers can provide valuable insight into the molecular mechanisms of this complex and heterogeneous disease. Furthermore, AKI biomarkers could also function as molecular phenotyping tools that could be used to direct clinical

intervention. This talk highlights the major studies that have characterized the diagnostic and prognostic predictive power of these biomarkers besides also looking at mechanistic relevance of these new biomarkers.

IL-11

The Latest in Creatinine: Center Point for Acute Kidney Injury

Mithu Banerjee

Department, Biochemistry, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India

AKI is defined as a rapid increase in blood creatinine or decrease in urine output. It's a constellation of Hepatorenal, cardiorenal, nephrotoxic and perioperative sepsis. The lab should provide clinicians with the right tool to aid in early Daignosis and staging. Traditionally Jaffe's and creatininase are the two analytical methods for creatinine estimation. In addition, POC instruments are used to perform creatinine in whole blood. Creatinine when estimated by Jaffe's method, causes 15-25% false elevations at physiological concentration due to presence of interference like protein, glucose, acetoacetate etc. Sources of analytical variability in creatinine estimation are Analytical imprecision, Analytical interferents and calibration instability. For monitoring of AKI with creatinine reports across labs, a low intermethod bias is desirable. Intra individual Biovariability of creatinine in healthy individuals 4.5%. The American Association of Clinical chemistry in their latest document on AKI recommends that Creatinine assay with intra lab variability of >3.4% are not recommended in clinical laboratories. RCV of creatinine, the point at which true change in biomarker in an individual can be detected by serial measurement is 0.2 mg/dl with baseline creatinine < 1.0 mg/dL or 20% of baseline whichever is higher when baseline creatinine >1.0 mg/dL. Baseline creatinine reflectsan individual's premorbid, usual renal function.

There are 3 methods of obtaining baseline creatinine :-

1. Measured creatinine within 7 days.
2. Measured creatinine value within 7-365 days before the current value.
3. By imputation when creatinine concentration is not available from calculated eGFR using age, gender& race.

Electronic AKI alerts in the LIS help in identifying AKI early but there is no evidence to suggest they lead to improved survival or reduced need for renal replacement therapy.

IL-12

What, Why and How of Acute kidney Injury AND role of Traditional Markers & Lab-informatics system

Purvi Purohit

Dept of Biochemistry, AIIMS Jodhpur
dr.purvipurohit@gmail.com

Acute kidney injury (AKI) is a clinical syndrome that complicates the course and worsens the outcome in a significant number of hospitalised patients. Accurate and prompt recognition of AKI and better understanding of the pathophysiologic mechanisms underlying the various clinical phenotypes are of great importance to research for effective therapeutic interventions. Although application of classification systems for AKI has improved diagnosis, early clinical recognition of AKI is still challenging, as increments in serum creatinine may be late and low urine output is not always present. The role of urinary biochemistry has remained pivotal, especially in critically ill patients. The fractional excretion of sodium (FENa) is used to improve the diagnostic performance of the urine sodium test in assessing the cause of AKI by standardizing it to creatinine excretion. Similarly, fractional excretion of urea (FEUr) has been proposed to separate prerenal AKI from ATN in patients receiving diuretics, which can alter urinary sodium and therefore affect both urinary sodium and FENa. Differentiating between a transient and persistent acute kidney injury is of great need in clinical practice, and despite studies questioning their application in clinical practice,

biochemistry indices continue to be used. AKI is partially preventable, if there is timely identification of the progressive renal damage in affected patients. However, this can be largely improved upon by an efficient use of laboratory information systems via generating timely lab alerts. The use of machine learning can go a long way in improving timely identification of AKI patients. The AACC guidance document on AKI observes the significance of traditional urinary markers and automated lab-alerts for an improved diagnosis of AKI and suggests these to be need of the hour.

IL-13

Application of Bioinformatics, Molecular Dynamics Simulations in Biomedicines

Debashree Chakraborty

Biophysical and Computational Chemistry Laboratory, Department of Chemistry,
National Institute of Technology Karnataka, Mangalore, India.
Email ID: debashree@nitk.edu.in

Computation approach to drug discovery has become an important tool for understanding the mechanism of the interaction between the protein and inhibhitor complex. Different computational approach can be utilised for studying drug-delivery, stability of the protein and also in designing of vaccines. In the presentation, a brief discussion regarding the different tools used for studying the stability of a protein, drug delivery and designing vaccines will be discussed by giving examples from SARS-Cov2 as a model protein system. The effect of hydrophobic group, electron withdrawing effect, hydrogen bonding effect of the substituents present in the inhibitor effects the potency of the antagonist. Further, the stability of a protein, RNA can be analysed by studying the network analysis of the conformation evolution of the biomolecule. Immunoinformatic tools are also found to be important for designing vaccines as they help to identify B-cell, T-cell epitopes.

Keywords: Drug discovery, MD simulations, Immunoinformatics

IL- 14

Charge Variable Cholic Acid Derived Polymers: A Platform for Ameliorating the Treatment of Diabetes

Avisek Bera, Subhasish Sahoo,
Pooja Ghosh, and Priyadarsi De

Polymer Research Centre and Centre for Advanced Functional Materials, Department of Chemical Sciences, Indian Institute of Science Education and Research Kolkata, Mohanpur - 741246, Nadia, West Bengal, India.
E-mail: p_de@iiserkol.ac.in

Insulin fibril formation is considered as the hallmark of severaldebilitating pathological conditions especially diabetes.[1-4] To develop effective therapeutics that are able to control the amyloidogenesis process and inhibit fibril formation, herein, we have synthesized water-soluble side chain cholic acid (CA)-based cationic, anionic and neutral polymers *via* reversible addition-fragmentation chain transfer (RAFT) polymerization technique[5]to understand the role of CA-based charge variable polymeric architectures in modulating the insulin aggregation process.Interestingly, the cationic polymer with cholate pendants (**CP-10**) acts as a potent inhibitor and showed better efficacy than cationic polymer without cholate conjugation (**CP-0**) in preventing insulin aggregation process, thus demonstrate the significance of cholate moiety in fibril inhibition process. On the other hand, the corresponding anionic and neutral polymers with and without cholate pendants showed much less inhibitory effects in inhibiting insulin aggregation process, because they do not have both electrostatic and hydrophobic interactions simultaneously. Overall, this work provides a novel insight for effective treatment of amyloidogenic disorders.

Keywords: Diabetes; Cholic acid; Cationic polymer; Insulin fibrillation; Fibril inhibition

IL-15

A New Quorum-sensing Mechanism in Macrophages Determines a Density-dependent Phenotype and Regulates Inflammatory Responses

Partho Sarothi Ray

Department of Biological Sciences,
Indian Institute of Science Education and Research IISER-Kolkata, India

Quorum sensing mechanisms that sense the density of immune cells at the site of inflammation to initiate inflammation resolution have recently been demonstrated as a major determinant of the inflammatory response. We observed a density-dependent increase in expression of the inflammatory tumor suppressor protein programmed cell death 4 (PDCD4) in mouse macrophage cells. Conditioned medium from high density cells upregulated PDCD4 expression, revealing the presence of a secreted factor(s) acting as a macrophage quorum sensor. Secreted Gelsolin (GSN) was identified as the quorum sensing auto-inducer. Alteration of GSN levels changed PDCD4 expression and the density-dependent phenotype of cells. LPS induced the expression of microRNA miR-21 which downregulated both GSN and PDCD4 expression, and reversed the high density phenotype. The high density phenotype was correlated with an anti-inflammatory gene expression program, which was counteracted by inflammatory stimulus. Together, our observations establish the miR-21-GSN-PDCD4 regulatory network as a crucial mediator of a macrophage quorum sensing mechanism for the control of inflammatory responses. These observations underscore and provide a mechanism of action for the anti-inflammatory role of Gelsolin in a number of inflammatory disease conditions, including COVID-19 induced pneumonia.

IL-16

FnCas9 Editor Linked Uniform Detection Assay (FELUDA)

Souvik Maiti

Scientist, CSIR-IGIB
Sukhdev Bihar, Mathura Rd, New Delhi

The present invention describes a method for using a bacterial CRISPR Cas Ribonucleoprotein complex for detecting single nucleotide variants in RNA or DNA or more broadly, any DNA or RNA fragment, without the need for sequencing. The principle ofdiscrimination is derived from the natural property of the enzyme being used for the invention, Francisellanovicida Cas9 (FnCas9) which shows very low binding affinity to mismatched substrates. DNA is isolated either from blood, saliva, or any other biological sources like bacteria and amplified if required. For virus infected patients, samples are collected as a nasal swab and inactivated. Total RNA isolated from the sample is converted to cDNA using the reverse transcriptase enzyme. The DNA (when test material is DNA) or cDNA (when test material is RNA, like for COVID-19) is subjected to Polymerase Chain reaction, amplifying using specific primers and tagging the amplified DNA products with a ligand of choice. The detection mix consists of labelled PCR products, sgRNA-fnCAS9 complex. The detection complex can be visualized using a wide array of technologies like lateral flow, gel based cleavage assay, fluorescence based detection, in both low, medium or plate based high-throughput format. Science behind this technology will be discussed in the presentation.

IL- 17

Intelligence Based Medicine: What We Should Know?

Sergio Bernardini

Chair IFCC-Emerging Technology Division (ETD)

The Different eras of the Modern laboratory medicine are: 1920 to 1940- the complicated era (manual work, laborious production of tests); 1940-1950-the simplified era (test production is simplified, kits start to be produced); 1950s-the crisis era (increased workload); 1960s-the sophisticated era (advent of automation and information technology); 1970s- the profiles era (creation of diagnostic profiles); 1970-2000-the automation era (development and implementation of total automation systems); 2000-2020-the consolidation era (networks of supra-regional laboratories resulting from a consolidation process, contraction and integration of the various branches of Laboratory Medicine; 2020-2030-the digitalization era. The Total Testing Process is changing too because some Digital Assistants start to be implemented in the pre-preanalytical phase (Intelligent ordering system), in the Pre-analytical phase (Intelligent manager) and in the post-analytical Phase (Intelligent Interpreting and reporting system). Artificial Intelligence raised many concerns from humanists but, at least to date, there is nothing really artificial and then we prefer talk about "Augmented Intelligence" because any process has still its roots in human work. Marvin Minsky told: "AI is the science of making machines does things that would require intelligence if done by human". Indeedhuman and machine intelligence can interact in a continuum from assisted intelligence, to augmented intelligence and finally autonomous artificial intelligence also called strong, broad or general, but the kind of intelligence is very far from being real. In 1956, a small group of scientists gathered for the Dartmouth Summer Research Project on Artificial Intelligence, which was the birth of this field of Research. In 1989 the term "Machine learning" was introduced to apply statistical methods in extracting information, knowledge, useful patterns, actionable insights from large amounts of data (data set) usually to solve a specific problem. Then Machine Learning was applied in Health Care where a big amount of Data is produced from clinical notes, images (X-ray, CT, MRI…), clinical laboratoryresults, pathology images and reports, medication, genome and family history and, in the next future, omics patterns reports. Then these clinical Data are usually merged with other Data obtained from Recommendations, Guidelines, Best Practice, Current Research, Ongoing clinical trials, new drugs Discovery and Doctors experiences. The application of augmented Intelligence tools in Medicine is growing very fast because it can be useful to face new evolutions in the Health care Systems all over the world: increase in request for care and life expectancy, multi-cronicity, patient's empowering, reduced time with Doctors, Limits in governments investments for Health Care and Increased expenses out pocket. Recently also Laboratory Medicine start to implement Augmented Intelligence tools in Hematology, Autoimmunity, Mass Spectrometry and Cancer diagnosis.

IL-18

Smart Technologies to Tackle Covid 19

Bernard Gouget

Chair IFCC Committee on Mobile Health and bioengineering in Lab Medicine (IFCC-C-MHBLM)

In Just a few months' time, The COVID-19 pandemic has significantly favored digital transitions and emerging technologies to deal with the emergency health situations, the shift towards remote working and mobility restrictions. The use of cutting-edge technologies, including artificial intelligence (AI), big data, telemedicine, block chain, 5G technology, smart applications, Internet of Medical Things (IoMT), robotics, geospatial technology, drones are substantially important for COVID-19 detecting, monitoring, diagnosing, screening, surveillance, mapping, tracking, and creating awareness. The smart technologies are transforming healthcare and the smart phone applications that connect large populations can be configured to tackle emergency situations. The patients have moved dramatically toward on line channels.

Technology and social media companies are already on their own mission to achieve global spread, reaching a point where everyone on this planet who wants one can have a digital and online presence.

The crisis has demonstrated that it is impossible to ignore technological advancements and the digital opportunities that can support the long-term sustainable development of each country. Digital transformation is changing the face of healthcare, however, to effectively use these technologies, we first need to fully understand the challenges that the healthcare sector experiences from multiple perspectives, including patients, healthcare professionals, management and public health.

IL-19

AI and Laboratory Medicine at the Heart of Translation for Network Medicine

Damien Gruson [1,2]

[1]*Pôle de recherche en Endocrinologie, Diabète et Nutrition, Institut de Recherche Expérimentale et Clinique, Cliniques Universitaires St-Luc and Université Catholique de Louvain, Brussels, Belgium.*
[2]*Department of Laboratory Medicine, Cliniques Universitaires St-Luc and Université Catholique de Louvain, Brussels, Belgium.*

Laboratory Medicine is at the heart of a novel health ecosystem where emerging technologies, smart testing, remote monitoring and data science act as drivers of the change. Consolidated clinical laboratories are also space for routine integration of multi-omics platforms (including genetics, epigenetics, transcriptomics, metabolomics, and proteomics), providing new services and pathophysiological insights to physicians. Network Medicine applies network science and multi-omics approaches to investigate disease pathogenesis through molecular networks, including protein-protein interaction networks, correlation-based networks, gene regulatory networks, and Bayesian networks. Network medicine and integrative approaches have already been applied successfully to coronary heart disease, diabetes mellitus, chronic lung diseases, and drug development, for example. To develop powerful integrative approaches, the use of artificial intelligence and computational biology is mandatory to improve the diagnosis, prognosis, and treatment of complex diseases. It is clear that clinical laboratories and specialists in laboratory medicine assisted by AI companions for data integration will provide key components and expertise for the transition of network medicine to clinical practices, with a high potential for new ways of caring complex diseases.

IL-20

Pharmacogenetics and Cardiovascular Disease: Opportunities and Challenges

Sanja Stankovic

Center for Medical Biochemistry, University Clinical Center of Serbia, Belgrade, Serbia and
University of Kragujevac, Faculty of Medical Sciences, Serbia

In the last decade, it became clear that for many pharmaceutical drugs, the administered dose itself was not predictive of the individual drug exposure and corresponding clinical effects and that drug dosage needed to be individualized in order to achieve best therapeutic effect with a minimum of adverse effects. This lecture will summarize the most relevant evidence currently available on pharmacogenetics (PGx) of cardiovascular drugs (antiplatelet therapy, oral anticoagulants, statins, beta-blockers), available PGx information and genetic tests, and its clinical implementation into daily clinical practice.Successes as well as unexpected challenges will be addressed. The lecture will specially focus on advances in PGx of antiplatelet drugs. Dual antiplatelet therapy traditionally consisted of aspirin and clopidogrel is recommended for the secondary prevention of ischemic complications in patients with acute coronary syndromes, following percutaneous coronary intervention and stent implantation. Unfortunately, substantial portion of patients experience adverse cardiovascular events that are associated with inadequate platelet inhibition in response to clopidogrel administration. Although

multiple variables have been implicated in altered clopidogrel response, mounting evidence has suggested a crucial role for common genetic variants. The effect of the CYP2C19, ABCB1, PON1 and P2RY12 variants on clopidogrel pharmacodynamics and risk-stratification of patients with ST-segment elevation myocardial infarction undergoing primary percutaneous coronary intervention assessed in prospective single-center study in our institution will be evaluated. The emerging issue of whether patients requiring antiplatelet therapy should continue to be treated with clopidogrel or receive the treatment alternatives that are capable of overcoming clopidogrel resistance will also be addressed. Personalized medicine is the treatment approach of the future with PGx as the core element. With the implementation of PGx in today's clinical practice on a broader scale, the treatments will be safer, more effective and cost-effective which, and will improve quality of care which every healthcare system should value.

Keywords: cardiovascular drug, clopidogrel, pharmacogenetics, therapy optimization.

IL-21

Investigating Dyslipidemia: What Does the Clinician want?

Devaki R Nair

Consultant Chemical Pathologist
Clinical Lead for Clinical Biochemistry Lipids and Cardiovascular Prevention
Director SAS Centre for Cardiac Biomarkers
Royal Free London NHS Foundation Trust, UK

Laboratory measurements in isolation for cardiovascular risk reduction is not appropriate but recent insight into development of specific therapies and control based onmolecular basis of lipoprotein metabolismhas necessitated the needfor appropriate laboratory investigations in dyslipidaemia. Initial investigations are to rule out secondary causes, and appropriate actions to control these. These are urine dipstick, liver function tests, renal function tests, blood glucose or glycated haemoglobin A1c. The second step is aimed at confirming a primary cause. In addition to a lipid profile fasting or non- fasting, lipid electrophoresis visualises a specific form of LDL in hereditary Ichthyosis or lipoprotein X in primary biliary cirrhosis. Lipid electrophoresis is useful inconfirmation of apolipoprotein A1 or B bsenceordeficiencies but does not offer advantage in routine testing.ApolipoproteinE phenotype using isoelectric focusing or selective electrophoresis after ultracentrifugation can demonstrate beta VLDL in Dysbetalipoproteinemia. Observing chylomicrons as creamy layer abovea clear serum or chylomicrons over opalescent serum containing VLDL may suggest type one or type five hyperlipidaemia respectively. The thirdly, Apolipoprotein E genotype to confirm type 3 hyperlipidaemia, and for FH in confirming a diagnosis of Familial Hypercholesterolaemia and aid in cascade testingas part of molecular testing.Molecular diagnosis for familial chylomicronaemiainclude mutation analysis of lipoprotein lipase gene as well as the genes for all four proteins that control Lipoprotein Lipase. Measurement of Lipoprotein(a), and homocysteine as CVD risk enhancers are needed. Ultracentrifugationovercomes interference of other measurements and is used to measure remnant particles. Measurement of small dense LDL, LDL particle size or numbers is of research interest. These tests are usefulwhere there is expertise in managing complex lipoprotein problems.

IL-22

Pathogenesis of Thrombotic Stroke in Young: Indian Scenario

Dr Renu Saxena

Director,
Path and Lab Medicine & Head, Hematopathology Medanta, The Medicity, Gurgaon 122018.

Stroke is an important cause of mortality and morbidity in India, being the third dreaded disease with an incidence of 73/ 1,00,000 per year. Compared to West, in Indians it is seen in higher frequency in young adults (15-45 yrs). Indian young adults constitute 15 – 30% of all stroke patients versus 3

to 4 % patients in the west. Several lifestyle factors that may contribute include age (risk doubles for every decade after age 55), gender (males>females), family history of stroke/ TIA, hypertension, diabetes, hyperlipidemia, obesity, smoking, sedentary lifestyle, drug abuse (e.g. cocaine use), hormone replacement therapy and oral contraceptive etc.

Stroke may be caused by hemorrhage or ischemia secondary to emboli or thrombosis of cerebral arteries or veins. Arterial thrombi may be occur due to defects in platelet functions, fibrinolytic pathway, hyperhomocysteinemia, antithrombotic protein defects or nitric oxide defects. Venous thrombi may occur due to APC resistance,Factor V Leiden mutation, Protein C/S deficiency, ATIII deficiency and/or presence of Antiphospholipid antibody syndrome. The results of above parameters in Indian stroke would be discussed in the talk. Based on these, it was suggested that stroke in young Indians was more common possibly because of high prevalence of PLA2 polymorphism causing increased platelet reactivity, high TAFI Ag levels, and high Vit. B12/FA deficiency induced hyperhomocysteinemia. It is important to identify these in patiens to institute appropriate therapies

IL-23

Infantile Markers of Adult Cardiovascular Disease: Role of Pediatrician in Prevention

Anita Khalil

Director Professor of Paediatrics
Maulana Azad Medical College, New Delhi

Cardiovascular Diseases (CVD)-major cause of morbidity and mortality globally and coronary artery disease is an important component of CVD. There has been significant regression of CVD in the developed countries in the last two decades- because of life style management with identification and modification of risk factors. India has one of the highest burden of CVD-expected to rise from 2.26 million (1990) to 4.47 million (2026). Autopsies of infant and children revealed presence of fatty streaks (2 years) and atheromas (15-18 years)- confirms the assumption that atherosclerosis begins in childhood. To reverse or arrest the process-initiate healthful life style which can be integrated with comprehensive pediatric care.

David Bakers' Hypothesis-Fetal Origin of Adult Diseases: Core theory-critical periods of development force the baby to resort to adaptive survival strategies-resetting of normal course of metabolic, physiological and anatomical development. This hypothesis is of greatest relevance in the developing countries. Barker made a path breaking statement- Blueprint of cardiovascular health is established before birth. There are numerous factors and mechanisms- which affect fetal growth and adult CVD outcomes.

Maternal nutrition: Reduced maternal nutrition leads on to lowered fetal birth weight, which is an important adult heart disease risk. Maternal hypertension leads on to lower birth weight of offspring-again a risj factor for development of hypertension in adulthood. Bsaker has also described the aftereffects of fetal under nutrition trimester wise and their relation with adult diseases.

Key messages

- Poor fetal growth with subsequent stunting in first 2 years of life leads on to shorter adult height, reduced health outcome and decreased offspring birth weight.
- Children who are undernourished in first 2 years of life, and later on put on weight rapidly, are at higher risk to develop chronic adult diseases.
- Prevention of maternal and childhood under nutrition is a long term investment, that will benefit the present and future generation.

IL-24

Lipid Associated Risk and Its Management in Atherosclerotic Cardiovascular Disease

Vimal Mehta

Dept of Cardiology, GIPMER, Delhi India

Coronary artery disease (CAD) manifests almost a decade earlier in India than in Western countries with 10%-25% of myocardial infarctions in India occurring before the age of 40 years and >50% of CAD-associated deaths in India occur before the age of 50 years. Although multiple risk factors including smoking, sedentary lifestyle, hypertension and diabetes are important contributors to ASCVD, dyslipidemia is the major condition necessary for the atherosclerotic process. Hence, optimal management of dyslipidemia is key to stem the epidemic of ASCVD. Lipids (cholesterol and triglycerides) in blood are carried on lipoproteins which have a hydrophobic lipid core and hydrophilic outer layer of phospholipids and apolipoproteins. The apolipoproteins are protein components of lipoprotein and serve as membrane stabilizers, cofactors and act as ligands for receptors. They have four major classes: A, B, C, and E. Traditionally LDL-C levels have been used to assess CV risk. Recent studies show that apo B and non-HDL-C levels are better predictor of risk. Multiple randomized trials have shown that statins by decreasing LDL-C levels reduce morbidity and mortality in patients both in primary and secondary prevention, however significant residual risk remains. Recent PCSK9 inhibitor trials have shown that ultra low levels of LDL-C (<30 mg/dl) further decrease CV events. Also decreasing triglyceride levels has been shown to decrease CV events. Lipoprotein(a) also enhances CV risk and its levels are decreased by PCSK9 inhibitors. The talk discusses about various lipids and lipoproteins, their role in atherogenesis and strategies to reduce their levels.

IL-25

Precision Diabetes Is Now a Reality in India

V. Mohan

Chairman & Chief of Diabetology,
Dr. Mohan's Diabetes Specialities Centre & Madras Diabetes Research Foundation,
Chennai, India
Email : drmohans@diabetes.ind.in,
Websites : www.mdrf.in&www.drmohans.com

Precision medicine aims to move away from generalized approaches that use a 'one size fits all' approach so that treatment decisions are *personalized* and based on individual variability in genes, environment, and lifestyle. Precision medicine takes into account these differences between individuals and allows to tailor health care that predicts more accurately which treatment and prevention strategies will work in *specific* people.

Personalized Medicine in Type 2 Diabetes

Type 2 diabetes (T2D), a complex condition characterized by elevated levels of plasma glucose, caused by impairment in both insulin secretion and insulin action. The etiopathogenesis of T2D involves interplay of both genetic and changing environmental factors. T2D is a polygenic disorder with over 200 known genes. In T2D, personalized medicine is becoming a reality, as different subtypes of T2D have been described. We recently described 4 clusters of T2D which includes SIDD (Severe Insulin Deficient Diabetes)], IROD (Insulin Resistant Obese Diabetes), CIRDD (Combined Insulin Resistant and Deficient Diabetes) and MARD (Mild Age-Related Diabetes). Obviously, the approach to management of these various subtypes will differ considerably. Insulin secretagogues would obviously be preferred for SIDD and insulin sensitizers for IROD and both groups of drugs for the combined types. The MARD is the easiest to treat as it is the mildest variety.

Personalized Diabetes in Monogenic Diabetes

In the case of monogenic diseases such as Maturity

Onset Diabetes of Young (MODY) and Neonatal Diabetes, genetic testing has now come to the realm of clinical practice as these are single gene defects which can be easily identified by genetic testing. Our centre is an ICMR Nodal Centre for India for monogenic diabetes testing (www.http://monogenicdiabetes.in/) Today, we know that based on genetic testing, MODY is a group of clinically heterogeneous forms of beta cell dysfunction that are defined at the molecular genetic level by mutations in different genes (eg., *HNF4A, GCK, HNF1A, HNF1B,etc*). By correctly identifying MODY, it is possible to avoid lifelong insulin injections in patients who are wrongly diagnosed to have type 1 diabetes.

One of the most gratifying clinical applications of Precision Diabetes is in the diagnosis of Neonatal Diabetes which is defined as diabetes occurring in the first 6 months of life. Children with neonatal diabetes carrying the *KCNJ11* and *ABCC8* mutations have been successfully switched over from insulin therapy to oral sulfonylureawhich is a great boon to the patient and the family.

In conclusion, precision or personalized medicine has finally come to the diabetes clinic. Good clinical phenotyping can make genetic testing cost effective. It can also help change the therapy from life long insulin injections to tablets for some forms of diabetes like monogenic diabetes which can be very gratifying to the patient and his / her family.

IL- 26

Lifestyle Disease and Metabolic Disorder

A. G. Unnikrishnan

CEO and Chief Endocrinologist, Chellaram Diabetes Institute,Pune, India 411 021
Tel – 8605011934, Email: ceo@cdi.org.in

In general, the term lifestyle disease has been applied to disease like type 2 diabetes, obesity and coronary artery disease. In reality, these disorders are complex and require complex solutions. In countries like India, what is required is a combination of "macro" as well as "micro" approach. The macro approach focuses on public health, community empowerment and awareness. The micro approach focuses on diagnosis and management of the disease from an evidence-based medicine perspective. This unique combination can help tackle the epidemic of cardio metabolic disease in our midst. Especially in the case of type 2 diabetes, this two pronged approach is essential. At the macro level urban spaces for exercise and cycling are important, as well as education and awareness about junk food avoidance to prevent child hood obesity and future diabetes. The training of community workers to empower people with diabetes to improve diet, physical activity, monitoring and treatment adherence is important. At the micro level, unique research into cost effective diagnostic and therapeutic strategies are the need of the hour. Prevalence of type 2 diabetes is increasing worldwide, and an urgent step is needed to control the disease and its complications, as well as prevent the disease.

IL-27

Insight into Pathophysiology of Chronic Pancreatitis

Pramod Kumar Garg

Executive Director, Translational Health Science and Technology Institute, Faridabad.
Professor of Gastroenterology, A.I.I.M.S.,New Delhi, India.
e-mail: pgarg10@gmail.com

Chronic pancreatitis (CP) is a chronic inflammatory disease of the pancreas. Chronic pancreatitis is characterized by acinar cell injury, inflammation and fibrosis of the pancreas. Genetic mutations /polymorphisms, alcohol, smoking, and some metabolic causes are major other risk factorsfor the development of CP (1). Morphologically, it is characterized by pancreatic ductal strictures and dilatation, calcification, and atrophy. The most troublesome and common clinical problem is recurrent/chronic abdominal pain in patients with CP which is difficult to manage and often reduces their quality of life. Functional consequences of chronic

pancreatic injury includeexocrine insufficiency leading to maldigestion and malnutrition, and endocrine insufficiency causing diabetes. Both genetic factors and environmental factors are important in the pathophysiology of CP (2). Genetic mutations/polymorphisms in *PRSS1, SPINK1, CFTR, CTRC* and some other genes have been strongly associated with CP (3). Repeated episodes of inflammation are the major pathological hallmark of CP. Oxidative stress has been shown to have an important role in the pathophysiology of CP (4). There are both endogenous and exogenous sources of oxidative stress. Exogenous xenobiotics such as alcohol, smoking, and petrochemicals lead to oxidative stress. Free radicals are generated intracellularly physiologically but may cause pathological injury if there is increasedproduction or decreased capability of scavenging the free radicals. Free radical mediated cellular perturbations cause alterations in redox state, cellular injury and thus contribute to inflammation. Deficiency of micronutrients leads to a suboptimal antioxidant capacity with reduced clearance/conversion of free radicals. A few randomized controlled trials have shown that antioxidant supplementation improve the antioxidant status and lead to significant reduction in pain in patients with chronic pancreatitis.

IL- 28

Does transfer RNA-derived RNA Fragments As Non-Invasive Biomarkers: As Novel Key in Non-Alcoholic Fatty Liver Disease and Metabolically Associated Fatty Liver Disease?

S Prakash

Department of Laboratory Medicine
All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029
Email: prakashaiims@gmail.com

The cellular identity and function depends on the correct and specific expression of genetic information. Different molecular genetic mechanisms and expression of noncoding small RNAs are involved in the transcriptional machinery and leading to the development of multiple diseases. The incidence of chronic liver diseases, including NASH, cirrhosis, hepatocellular carcinoma (HCC), is widely increasing worldwide particularly non-alcoholic fatty liver disease recently termed as metabolic associated fatty liver disease. Biopsy-only in chronic liver disease are not be appropriate for disease management as they are not evenly distributed throughout the liver and sampling a relatively small area of tissue gives also rise to false-negative results. tRNA fragments 16-35 nucleotide are highly abundant and circulating tRNAs in many types of cells including stem cells and cancer cells. They are found in all domains of life and their cleavage occurs during the stage of either premature or mature tRNAs at various active positions. Unrepaired tRFs may be subsequently involved in pathogenesis of NAFLD and whether this transfer RNA (tRNA)-derived fragments (tRFs) regulate the progression of NAFLD which is not clear. The management of NAFLD patients is poor due to the late diagnosis of the disease and at present no effective therapies so far. Here, enlighten and highlights are transfer RNA derived RNA fragments alteration involved in the process of MAFLD, NAFLD and leading to hepatocellular carcinoma, and discuss about the applicability of non-invasive molecular biomarkers as therapeutic targets and liquid biopsy for diagnosis of NAFLD. The production of tiRNAs and tRFs are

involved through in multiple biological processes, and these fragmented parts are not random cleavage products. tRNA-derived fragments are the regulatory noncoding small RNAs and having distinct biological functions in various cancers and even in stress-induced diseases. Herein, various classifications based on loci and biogenesis of tRFs and their formation from pre-tRNAs or mature tRNAs will discuss. Several tRFs are involved during the post-transcriptional regulation through reassigning of RNA binding proteins and promoting to ribosomal biogenesis with translation initiation. Many questions have arisen and still unanswered such as origin, existence of tRFs, locations (nucleus, cytoplasmic), mechanism, and different cleavage loci of tRFs, safe and effective in clinical scenario as well as for the therapeutic applications in NAFLD and MAFLD? Rapidly increasing prevalence of NAFLD and aggressive form of NASH is required to discuss the novel molecular non-invasive fibrosis approach to identify tRFs as forecast biomarkers to prevent disease progression to advanced fibrosis or cirrhosis and liver cancer. Therefore, updated views are focusing on the specific role of tRFs mechanisms mediated regulation of mRNA stability and translation, stress responses and viral infections and their potential roles as biomarkers or therapeutic targets in NAFLD and MAFLD. Taken together, the novel molecular signatures and their roles and applications of tRFs still require intensive future study.

IL- 29

Hepatic Endothelial Injury in Patients with Liver Cirrhosis

Savneet Kaur

Dept of Molecular and Cellular Medicine, Institute of Liver and Biliary Sciences (ILBS)
Email: savykaur@gmail.com, 91-9312199899

Objective: Hepatic endothelial dysfunction plays a key role in the progression of advanced liver diseases. In this study, we characterized liver endothelial injury biomarkers in patients with liver fibrosis and cirrhosis of varying etiologies. Methods: Endothelial injury-associated markers in liver tissues and blood were studied by real time PCRs and ELISAs respectively. Transcription factors (TFs) controlling the differentially expressed genes (DEGs) were studied by bioinformatics. Role of a key transcription factor regulating the DEGs was analyzed in the in vitro and in vivo mice models of liver injury. Results: Hospitalized patients with liver fibrosis/cirrhosis were included. DEGs such as, CCL2, IL8, VEGFR1, Ang1, ICAM1, eNOS, PPARγ, CXCR4 and RUNX1 were observed in liver biopsies in the patients as compared to healthy controls. Among the TFs, RUNX1 controlled the expression of maximum DEGs and was explored further. RUNX1 nuclear positivity was maximally seen in liver sinusoidal endothelial cells (LSECs) and was positively correlated with fibrosis and inflammatory grade in patients. Treatment with RUNX1 siRNA downregulated expression of the adhesion molecule, ICAM1 and the chemokine, CCL2 in LSECs, both in vitro and in vivo. RUNX1 inhibition also abrogated hepatic inflammation in mice models of liver injury. In cirrhotic patients, levels of serum ICAM1 was significantly increased as compared to healthy controls and patients with fibrosis and was associated with an unfavourable clinical outcome. Conclusion: RUNX1 regulates the expression of ICAM1 in LSECs, which may be key factor in enhancing inflammation, disease severity and mortality in patients with liver cirrhosis.

Keywords: Endothelial Injury, Cirrhosis, Inflammation,

IL- 30

Big Data and AI in Laboratory Medicine: Progress and Challenges

Stephen R. Master[1,2,*]

[1]*Department of Pathology and Laboratory Medicine, Children's Hospital of Philadelphia, Philadelphia, USA*
[2]*Perelman School of Medicine, University of Pennsylvania, Philadelphia, USA,masters@chop.edu*

The rapidly increasing rate of data acquisition has led to transformational changes in a variety of industries, including health care. This increase

has led to a number of challenges, including difficulties in data manipulation, inconsistency in data quality, and the inherent problems in understanding high-dimensional data sets. However, machine learning / AI has emerged as an effective way to make successful predictions based on such data sets. Within the field of laboratory medicine, recent publications have described the application of machine learning to large laboratory data sets in order to predict a variety of relevant patient conditions. In this lecture, we will describe the fundamental rational for expanding the traditional laboratory emphasis on single-analyte diagnostics into higher-dimensional analytical frameworks. We will outline and demonstrate the use of machine learning in high-dimensional data sets, including, as an example, work from our group demonstrating the effective diagnosis of myelodysplastic syndrome in a screening context using hematology analyzer parameters.

IL-31

Evaluation of Pneumatic Tube Systems to Reduce Transport-Induced Hemolysis

Joe M. El-Khoury, PhD, DABCC, FAACC

Director, Clinical Chemistry Laboratory
Co-Director, Clinical Chemistry Fellowship Program
Yale-New Haven Health
Associate Professor of Laboratory Medicine
Yale School of Medicine

Session Overview: Pneumatic tube systems (PTSs) are critical for modern hospital operations, allowing for rapid sample transport from patient care areas to the laboratory. Despite its widespread use, PTSs can affect laboratory values of some assays and compromise specimen integrity.It is well documented that PTS transport can cause cellular sheering, resulting in increased hemolysis (h-index), lactate dehydrogenase (LDH), and potassium (K^+). In this session, we will review why it is important that the clinical laboratory evaluates their PTS, how to do it, and discuss practical approaches to reduce the effects of hemolysis caused by PTS transport.

IL-32

Interferences in Immunoassays with Interesting Case Studies

Lakshmi V. Ramanathan, PhD

Service Chief, Clinical Chemistry Service, Attending Chemist, Director, Point Of Care Testing, Department of Laboratory Medicine, Clinical Member, Memorial Sloan-Kettering Cancer Center, New York, US

Immunoassays are extensively used in clinical practice as they are rapid, simple, cost effective and available on most chemistry instrument platforms. However, they pose several challenges to the practicing clinical chemist in terms of sensitivity of assays, quality of antibody, cross reactivity, biotin, heterophile antibodies, hook/prozone effects and immunotherapy.

In this session we will examine real life scenarios involving cases from our institution and describe how these interferences can be addressed. The learning objectives are:
1. List the different types of interferences and how to identify them.
2. Describe methods to overcome interference.
3. Understand possible effects of immunotherapy on frequently ordered tests.

IL-33

Molecular genetic testing: Principles and Applications in Genetic Diagnostics

Ashwin Dalal

Diagnostics Division, Centre for DNA Fingerprinting and Diagnostics, Hyderabad

Genetic diseases are known occur due to various types of mutations in the human genome. The molecular assays to diagnose these diseases have been developed based on the type of mutation commonly seen in each disease. There are a number of prerequisites to be kept in mind before ordering a Molecular Genetics test. The doctor ordering the tests needs to understand the principle behind the molecular assay, detection rates in each disease, limitations of the assay, utility of molecular genetic test in the particular disease etc. Although molecular genetic testing is not needed for diagnosis of diseases like Duchenne muscular

dystrophy, but it is a must for prenatal diagnosis of these diseases. In other diseases like Myotonic dystrophy, molecular diagnosis is mandatory for diagnosis of the disease. In addition the patient needs to be counseled regarding the need and limitations of the test before conducting a molecular genetic test. A number of different techniques are used to identify mutations in genetic diseases. Assays based on PCR and restriction enzymes have been used to detect mutations in past. However improved methods based on sequencing of genes are being used in diseases caused due to point mutations. Some diseases occur due to large deletions or duplications, which cannot be detected by sequencing. Traditionally these diseases have been studied using PCR based approaches like multiplex PCR or restriction enzyme digestion. However, recently newer methods are being increasingly used in diagnostic laboratories for detection of large deletions and duplications. Multiplex Ligation dependent Probe Amplification (MLPA), Real time PCR (RT-PCR), array comparative genomic hybridization etc are some of these techniques. Advances in the field molecular genetics have now made it possible to sequence whole exome or whole genome of an individual. These techniques are going to revolutionize the field of diagnostics using molecular methods in future. Various techniques used in molecular diagnosis of genetic muscle diseases will be discussed in the presentation.

IL-34

Applications of Microarray CGH and Exome sequencing in Genetic diagnostics

Anju Shukla

Department of Medical Genetics Kasturba Medical College, Manipal

The diagnosis of genetic disorders has been revolutionised in the last decade with the advent of unbiased genomic tests especially chromosomal microarray and exome sequencing.Chromosomal microarray is the first tier test for individuals presenting with intellectual disability, autism with or without any malformation/dysmorphism and helps to detect the copy number variants. Exome sequencing is primarily employed for identification of single nucleotide variants and small indels for monogenic disorders. Appropriate application of these techniques can lead to detection of genomic variations in a significant proportion of families.These tests are now being employed in the routine clinical care of families with genetic disorders. Adefinitive diagnosis is a crucial step for informed genetic counselling, management and prevention of these genetic disorders.

IL-35

Molecular Diagnostics in Mitochondrial Diseases

P. Govindaraj

Laboratory of Human Molecular Genetics,Centre for DNA Fingerprinting and Diagnostics, Hyderabad.
Email: govind@cdfd.org.in

Last decade of biomedical research, there has been a remarkable convergence of interest in the powerhouse of cells, the mitochondria. Mitochondrial dysfunction is associated with a broad spectrum of human disorders, ranging from rare, inborn errors of metabolisms to common, age-related conditions, including cardiovascular and neurodegenerative diseases. However, the emerging field of mitochondrial medicine is hindered by the complexity of these organelles and breadth of implication in disorders, leading to a lack of mechanistic insights, biomarker discovery, and therapeutic targets. Mitochondrial diseases are multi-systemic, heterogeneous group of disorders affecting children and adults with 1 in 5000 individuals. They are due to mutation in mitochondrial DNA (mtDNA) or nuclear DNA that can affect the assembly of mitochondrial components and function. Because of the clinical and genetic heterogeneity; and tissue-specificity, often rendering the diagnostic process protracted and challenging. My presentation will focus on the integrative approachfor diagnosing mitochondrial disordersinvolving the clinical, imaging, pathological, biochemical, and molecular genetics aspects.

IL-36

IFCC Taskforce on Global eLearning: experience of the first year and next steps

Adrian Park

Consultant Chemical Pathologist & Metabolic Medicine Physician
Department of Clinical Biochemistry at Addenbrooke's Hospital, Cambridge, UK
Email:adrian.park@addenbrookes.nhs.uk

At the end of 2020, the IFCC launched a TaskForce to promote eLearning globally. This was called 'The IFCC Taskforce on Global eLearning/eAcademy.' This Taskforce first met in February 2021. Since then, the Taskforce has coordinated a number of international IFCC webinars, as well as meeting on a regular basis to discuss how best to serve the eLearning needs of the IFCC members going forwards.The aim of my presentation is to present an overview of the Taskforce's work in 2021 and to discuss how the eLearning/ eAcademy may develop over the coming years.

IL-37

Overview of E-Learning: E-Learning Platforms in Laboratory Medicine

Hikmet Can Çubukçu

Ankara University Stem Cell Institute, Interdisciplinary Stem Cells and Regenerative
Medicine, Ankara, Turkey
Email: hikmetcancubukcu@gmail.com

The utility of internet technologies has paved the way for the development of e-learningplatforms. Learners can control their pace of learning with these platforms according totheir objectives and access a vast amount of knowledge. The content, management,delivery, and standardization constitute four main components of e-learning that shouldbe addressed and improved during the platform development. There are some drivers andchallenges about e-learning reported in the literature. Overall, e-learning has mostly beenfound to be as effective as traditional learning modalities, according to published studies.During the COVID-19 pandemic and its restrictions like lockdown, e-learning platformssurrogate the traditional education system. Platforms like IFCC e-Academy, EFLM e-learning platform, and AACC learning lab offer ample learning opportunities tolaboratory medicine residents and up-to-date knowledge for laboratory professionals tokeep up with life-long learning.

IL-38

New e-learning trends in Clinical Laboratories : The post COVID era

Rania El Sharkawy

Professor of Chemical Pathology
Medical Research Institute, Alexandria University
Email:raniashark@yahoo.com

The effective learning process is created by combining a comprehensive educational content ondigital support systems. The emerging new technologies, new learning theories and dynamiclearners' personal needs have led to continuous urgent need of updated trends in e- learning. Individualizing the learning environment for a certain content area is the new focus of all e-learning systems. Several new trends in e-learning environments have recently taken place suchas, artificial intelligence (AI), virtual and mixed reality,big data and blended learning as well asinternet of objects. These new e-learning trends offer significant benefits, such as creating aneffective development plan , the best education systems and maintaining a personal learningenvironment all are executed in a flexible environment.

IL-39

Recent scenario of eLearning in India: The road ahead

Prasenjit Mitra

Assistant Professor (Biochemistry)
Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh, India
Email:prasy4u@gmail.com

The advent of eLearning has totally changed the process of gaining knowledge and it seems the future of education will rely a lot more on it. During the COVID-19 pandemic, the growth of eLearning in the country has been exemplary and almost

all form of education took the virtual route to keep things going. It is noteworthy that eLearning has completely reshaped the educational system globally. Although eLearning has changed the way people learn and has made education to reach to a diverse group of audience, it has its own set of issues in the country. These include the difficulties to adapt to the virtual mode, missing a wholesome learning experience and suffering changes in the mental and physical health. The process of eLearning, apart from influencing an individual, also affects the society in a major way. It is high time for the Indian educational system to adapt and compete with the fast growing global market of educational technology. Further, implementation of appropriate Government policies will alsoplay a major role in deciding the fate of eLearning in India.

IL-40

Point of Care Test: The Color Reactions Should Not Be Forgotten

Dibyajyoti Banerjee

Department of Experimental Medicine and Biotechnology, PGIMER, Chandigarh 160012
**dibyajyoti5200@yahoo.co.in*

Point of care testing tool development is an area of multidisciplinary concern. In recent era almost all the branch of science and technology is involved in development of POCT tools. Generally, the recent technological breakthroughs are popular in POCT development. Nanotechnology, microfluidics, lab on a chip, LC MS or other high-end technologies are getting approved for the purpose. These technologies are indeed products of cutting-edge research and often produces sensitive and specific results. However, they are often not affordable by a common man of a developing nation. Therefore, the relevance of colour reactions have not come to an end for POCT development. This aspect will be discussed from day to day research experience in the subject.

Keywords: Point of care, Color reaction, Human serum albumin, Acetylcholinesterase, Bisphenols

IL-41

Quality Assurance in Clinical Laboratories

Neeraj Jain

President- MELAP

In healthcare today, medical laboratories are key partners in ensuring and maintaining patient safety, and it is seen that laboratory results influence approx. 70% of medical decisions. Quality standards of the laboratory plays a major role in ensuring the correctness of these results, providing better patient care as a whole and promoting excellence. While the absence of the same may lead to unreliable results, causing a delay in treatment, misdiagnosis and an increase in cost due to a need for retesting. COVID-19 Pandemic has affected everyone globally & correct lab diagnosis is very important. Therefore, ICMR has made it mandatory to allow only accredited labs to perform RT-PCR test.

Good quality is never brought about by accident; it is almost always the cumulative result of sincere intentions, dedicated effort, intelligent direction and skilful execution. As a choice, good qualitymay not necessarily be the easiest or the cheapest; however it is definitely the wisest for both patient health and welfare as well as laboratory credibility.

International standard ISO15189, based upon ISO17025 and ISO9001 standards, provides the basic requirements for establishing competence and serves as the bible for quality in medical laboratories. And while this serves as an excellent guiding principle, no matter how good the quality mechanisms are on paper, truly good quality cannot be achieved if theory is not translated into practice day-in and day-out.

The entire process of managing a sample must be considered including the beginning i.e sample collection to end i.e reporting and saving results.

Laboratory tests are influenced by:
*Lab environment

*Knowledgeable staff
*Reagents and Equipment
*Quality control
*Communications
*Process management
*Occurrence management
*Record keeping

Following are the Quality essentials which act as building blocks for quality management.

- Personnel: Human resources, job qualifications, job descriptions, orientation, training, Competency assessment, professional development, continuing education.
- Equipment: Acquisition, installation, validation, maintenance, calibration , trouble shooting, service and repair, records.
- Purchasing and inventory: Vendor qualification, supplies and reagents, critical services, contract review, inventory management.
- Process control: Quality control, sample management, method validation, method verification.
- Information Management: Confidentiality, Requisitions, logs and records, reports, computerised laboratory information system (LIS)
- Documents: Creation, revision and review, control and distribution.
- Records: Collection, review, storage, retention.
- Occurrence Management: Complaints, mistakes and problems, documentation, root cause analysis, immediate actions, corrective actions and preventive actions.
- Laboratory Assessment:

Internal:Quality indicators,audit reports, audit reviews.
External: Proficiency testing, inspections, accreditation.

- Process improvement: Opportunities for improvement (OFI), stakeholder's feedback, problem resolution, risk assessment, preventive actions, corrective actions.
- Customer Service: Customer group identification, customer needs, customer feedback.
- Facilities and Safety: safe working environment, transport management, Security, Containment, waste management, Laboratory safety, ergonomics.

Implementing an efficient Quality Management system does not guarantee a 100% error free laboratory, but it goes a long way in detecting errors that may occur commonly, and prevents them from recurring. It essentially puts us on the path to continuous improvement, and brings us closer to our vision of bettering healthcare facilities every day.

There is a cost associated with Quality, but are we cognizant of the fact that poor quality costs us even more? Quality costs can be offset by quality payoffs like enhanced reputation, loyal clientele, reduced system failures & machine downtime, less need for retesting for complaints etc. However there is no offset for medical implications that may be caused by poor quality, and its impact on not just the laboratories in question but on healthcare as a whole.

Thus, implementing and maintaining good quality standards in laboratories is no more a choice, as it is not just the ethical and moral duty of all laboratories to provide accurate, reliable results, but it is essential to all aspects of healthcare and the medical profession.

IL- 42

Quality Management and Assessment: Integration of Culture of Quality to Improve Patient Safety and Healthcare Delivery.

Jawahar (Jay) Kalra

Department of Pathology and Laboratory Medicine, University of Saskatchewan and Royal University Hospital,
Saskatoon, Saskatchewan, Canada.

Medical errors have gained significance due to their increased prevalence, which is detrimental to the quality care and safety of patients. Failure to inform the patient of adverse events caused by a medical error compromises the autonomy of the patient. It also jeopardizes the opportunity to

improve the quality in health care. Disclosure of an adverse event is an important element in managing the consequences of a medical error.When errors occur, healthcare practitioners are faced with the ethical dilemma of if, and to whom to disclose the error. This dilemma of disclosure is faced by healthcare providers across all disciplines, locations and generations and has far-reaching implications on healthcare quality and the progress of medicine. We have previously reported a non-punitive, "no-fault" model for reporting medical errors. Recently, we have also suggested the best practice guidelines for medical error disclosure, based on several professional and ethical principles.The complexities of medical error disclosure to patients present ideal opportunities for medical educators to probe how learners are balancing the ethical complexities involved in error disclosure. Effective communication between health care providers, patients and their families throughout the disclosure process is integral in sustaining and developing the physician patient relationship. Medical error is an inherent part of healthcare – disclosure of these errors is a necessary step in identifying areas in which we can grow as a profession to foster a culture of safety and transparency, strengthen partnerships, and improve the quality of healthcare delivery. We believe that the disclosure policies can provide framework and guidelines for appropriate disclosure which can lead to more transparent practices. We suggest that disclosure practice can be improved by creating a uniform policy, centered on addressing errors in a non-punitive manner and respecting the patient's right to an honest disclosure and be implemented as part of the standard of care.

IL-43

Newborn Screening for Inherited Metabolic Disorders

James R Bonham

President- International Society for Neonatal Screening
Director, Pharmacy, Diagnostics & Genetics,
Sheffields CHildren's Hospital, NHS, UK
e-mail: j.bonham@nhs.net

Since the ground breaking work of Robert Guthrie in the 1960s to promote newborn screening for phenylketonuria it is estimated that perhaps 100,000 children, many now adults, have benefitted from this life changing intervention. The subsequent developments by Millington and Chace employing tandem mass spectrometry in the 1990s subsequently provided the potential to screen for many more metabolic disorders with a single test. The dilemma faced around the world was how to choose the conditions that might be included in national programs and countries have made differing choices. In this presentation we will explore the basis for the selection of IMDs to be included and why variation in practice has evolved. We will emphasise that, to be effective, newborn screening needs to be part of a well co-ordinated programme leading to effective treatment. We will also explore the importance of robust case definitions and the role of outcome studies to guide screening practice. Finally we will look to the future to consider how the potential offered by genomics, both in the detection of candidate conditions and in their treatment, emphasises the need for careful consideration and a detailed understanding of the conditions to be screened if we are to protect families and benefit patients.

IL- 44

Hepatorenal Tyrosinaemia: From Biochemical Pathophysiology to Clinical Symptoms and Therapy

Anibh M. Das

Dept. of Paediatrics, Hannover Medical School; das.anibh@mh-hannover

Hepatorenal tyrosinaemia (HT1) is an inherited metabolic disorder in the degradative pathway of tyrosine due to fumarylacetoacetase deficiency. Untreated patients suffer from liver dysfunction/frank liver failure, renal dysfunction, long-term complications are hepatocellular carcinoma (HCC) and neurocognitive deficits, premature death is common. Biochemically, untreated patients show elevated tyrosine levels and accumulation of other toxic compounds proximal to the deficient enzyme, like succinylacetone (SA) which is used as a surrogate parameter of toxicity in HT1-patients. Treatment of HT1 is possible using nitisinone which is a substrate reduction therapy acting on a dioxygenase proximal to fumarylacetoacetase and has to be combined with nutritional protein restriction to avoid excessive tyrosine elevation. Nitisinone was originally developed as a herbizide and later repurposed to a therapeutic drug for HT1-patients suppressing the production of toxic compounds. This drug has revolutionized the clinical course in HT1-patients leading to normalisation of SA and must be combined with a low-protein nutrition. Under this regimen, liver transplantation is rarely required in therapy-refractory patients or when HCC develops. If diagnosis and treatment are delayed the outcome is worse. The risk to develop HCC for example is 13 times higher when treatment starts after the first birthday compared to neonatal initiation of therapy. Diagnosis is based on elevated SA in blood/urine and can be confirmed by genetic testing. Tyrosine elevation is unreliable. A clinically latent phase of several weeks in most patients makes HT1 an ideal target disease for newborn mass screening using SA in dried blood spots.

Keywords: Hepatorenal Tyrosinaemia, amino acids, nitisinone, succinylacetone, newborn screening, substrate reduction

IL 45

BVVLS is a Rare Neurologic Disorder

Kallol K.Set, MD

Pediatric Neurologist
Boonshoft School of Medicine, Wright State University, Dayton, Ohio, USA.
setk@childrensdayton.org

Riboflavin (vitamin B2), a water-soluble vitamin, is an essential nutrient as it is not endogenously synthesized, with requirements being met principally by dietary intake. Tissue-specific transporter proteins direct riboflavin to the intracellular machinery responsible for the biosynthesis of the flavoenzymes flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD). These flavoenzymes play a vital role in bioenergetics, DNA repair, chromatin remodeling, protein folding, apoptosis, and other physiologically relevant processes. Impairment of flavin homeostasis in humans may lead to multisystem dysfunction including neuromuscular disorders, anemia, abnormal fetal development, and cardiovascular disease. In this presentation,an overview of riboflavin absorption, transport and metabolism as well as Riboflavin deficiency disordershave been discussed. Then an approach to diagnose and treat a very rare metabolic disorder in children: Brown-Vialetto-Van-Laere syndrome (BVVLS)has been elaborated.BVVLS is a rare neurologic disorder with motor (limb, neck, and respiratory muscle weakness), sensory (gait ataxia), and cranial neuropathies (bulbar palsy, hearing loss, facial weakness, optic atrophy, and nystagmus), in combination with lower motor neuron signs and ataxia due to riboflavin transporter deficiency. Some cases may resemble amyotrophic lateral sclerosis. This condition may be prevented or treated if diagnosed early.

IL-46

Molecular Diagnosis in Inborn Metabolic Disorders-Beta Thalassemia and Duchenne Muscular Dystrophy

Kannan Vaidyanathan,
Manuprasad PK, Reshma CK

Molecular Biology, Amrita Institute of Medical Science & Research Center, Kochi, Kerala, India
drkannanvaidyanathan@gmail.com

Molecular diagnostics is increasingly applied to practical diagnostic testing, including Inborn Metabolic Disorders (IMD). In this talk, we present data on molecular diagnosis of 2 genetic disorders, viz., beta thalassemia and Duchenne Muscular Dystrophy.

Beta thalassemia is among the most common single gene disorders worldwide, caused by variations encoding the human beta-globin gene (*HBB*). The most common *HBB* gene mutation reported in Indian population is IVS I-5 (G/C) followed by IVS I-1 (G/T), 619-bp deletion, Codon 41/42(-TCTT) and Codon 8/9 (+G). These mutations account for 94% of the overall mutations identified in the Indian population. No study has been conducted in the densely populated state of Kerala to understand the prevalence of mutation. We have identified pathogenic variations in HBB gene for 31/43 (72%) patients analysed in our laboratory. The common variation identified in our study was NM_000518.5(HBB):c.92+5G>C variation (28%), followed by NM_000518:c. 20A>T; p.Glu7Val sickle cell variant and NM_000518.5(HBB):c.79G>A (p.Glu27Lys) in compound heterozygous patients.

Alterations in the DMD gene, encoding the dystrophin protein, are known to be common in **Duchenne muscular dystrophy (DMD)** and Becker-type dystrophy. The DMD gene is located on the X-chromosome. Many mutations are known to be associated with DMD; the commonest being gene deletions/duplications. The objective of our study was to find the variations in DMD gene in confirmed cases of DMD/Becker-type dystrophies. We have studied DMD gene deletion/duplication by Multiplex Ligation-dependent Probe Amplification (MLPA) technique over a two-year period (2018-2019). 30 patients were detected to have DMD. The commonest changes detected were exons 44-55 deletions (9 patients). Other changes detected were exons 1-44 deletions (5 patients), duplications (3 patients) and exon 55-79 deletions (1 patient). 12 patients tested negative for DMD gene alterations.

IL-47

Guidelines on Ethical Conduct of Research

Sirshendu Chaudhuri

Indian Institute of Public Health, Hyderabad, India

There are national and international guidelines available for maintaining ethical integrity in biomedical research. These guidelines started developing at the end of World war II and still evolving with the changing nature of research. India has developed its guidelines in the 1980s based on the ethical principles given in the standard international guidelines. Subsequently, the country has come up with several modifications of the initial draft and some other relevant guidelines. The Indian Council of Medical Research has taken the lead role in framing and disseminating these guidelines. The research stakeholders in the country must understand and abide by these guidelines to protect the research participants from research-related harm.

IL-48

Roles and Responsibilities of Ethics Committee Members

E. Kamala Esakkimuthu

Associate Professor, Anatomy
Trichy SRM Medical College Hospital and Research Centre, Trichy - 621105

The institutional ethics committee (IEC) is an independent body framed by the institution having due representation of all stakeholders of

a clinical trial. The roles and responsibilities of the members of the IEC including the chairman is mainly to evaluate the study proposals involving human as study subjects, for any violation of the basic bioethical principles such as Autonomy, Beneficence, Non-Maleficence and Justice. Protection of vulnerable subjects is also predominantly the duty of IEC. Timing of convening is of essence for the clinical trails and room for repetition of IEC meetings should be available for the proper monitoring of studies. The IEC is ideally preceded by the approval and careful monitoring of an institutional review board or Scientific review committee which investigates the Material and methodology including the statistics employed for the study. The IEC should preferably accept all study proposals after making necessary changes to it to make it ethically plausible.

IL- 49

Ethics in Laboratory Medicine

Sucheta P Dandekar

Professor, Biochemistry, Era's Lucknow Medical College
Adjunct Faculty Manipal Academy of Health Sciences
Formerly Professor & Head, Seth GSMC &KEMH, Mumbai

Several ethical issues exist within the diagnostic medical laboratory. The major ethical challenges such as; consent, confidentiality, codes of conduct, conflict of interest, lab utilisation, proficiency, and direct access testing are some times more prevalent in resource-limited settings. Presently, decisions regarding diagnosis and patient's treatment are commonly taken on the basis of outcomes and interpretations of laboratory test results. Therefore, ethics plays a significant role in laboratory medicine. Various international and national guidelines and declarations have been evolved with time to time and thus critically upgraded the practice of bio-ethics in the field of biomedical research. These aspects shall be discussed in the talk.

IL- 50

Emerging Role of Extracellular Vesicles in HIV Infection: From Immunopathogenesis to Therapeutics

Himanshu Sharma

Department of Biochemistry, AIIMS Bathinda, INDIA

The extracellular vesicles(EVs) are small membrane bound vesicles released from different cell types by natural process and ranges in size from 100-150 nm. In the recent years role of EVs in the pathogenesis of various viral diseases has been significantly explored, due to their ability to act as an intracellular communicator and thus transfer contents like nucleic acid, lipids and proteins from one cell to another. It is shown previously that EVs composition get altered during infections, specifically in infections by intracellular pathogens such as viruses like HIV. During HIV infection cargo packed in EVs derived from HIV infected cells can modulate viral recognition by the immune system which may induce or restrict viral propagation in the neighbouring recipient cells. Concomitantly in our recent study we have also shown how altered miRNA in EVs released from HIV infected cell modulate proliferative signalling in recipient pulmonary arterial smooth muscle cells. Apart from pathogenesis, role of EVs in therapeutic and preventive interventions during HIV infectionis also rapidly emerging.For example, therapeutically engineeredEVs derived from mesenchymal stem cells have the ability to induce the differentiation of anti-inflammatory macrophages, inactivate T cells and induce regulatory immune cells such as T and B lymphocytes and dendritic cells. Studies have also shown that EVs derived from bodily fluids naturally display anti-HIV-1 activity and hence are potential tool for the development of new antiretroviral therapies.

IL-51

Genomics in Controlling Infections: Understanding the Promises and Hurdles of NGS

Ankita Singh

Institute of Genomics and Integrative Biology (IGIB), New Delhi, INDIA

Whole genome sequencing (WGS) is an important tool for emerging pathogen detection and characterization. Metagenomic NGS (mNGS) allows for sequencing all the nucleic acids directly from patient specimens including pathogen and human DNA and RNA without culture. This method provides an unbiased detection of all microbial groups, resistance markers, and virulence factors, as well as host biomarkers associated with different disease states. The greatest attraction of genomic approaches is that WGS could provide all relevant information about a pathogen in a single assay, including species identification, strain typing, virulence determination, and antimicrobial resistance. The tremendous promise of NGS methods for diagnostic infectious disease testing will require the successful development of clinical microbiologists capable of interpreting and evaluating NGS data and placing these data in the appropriate clinical context.

IL-52

Non-coding RNAs in Viral Infections: Implications for Disease Diagnosis and Treatment

Roopali Rajput

Department of Biochemistry, School of Chemical and Life Sciences, Jamia Hamdard, New Delhi, India
E-mail ID: roopali.rajput@gmail.com

Viral infections are known to impose huge socio-economic losses worldwide. The recent years have witnessed a series of epidemics and pandemics caused by different emerging and re-emerging viruses that caused massive mortality and affected the lives of billions. It, thus, becomes necessary to ramp up the preparedness to combat and control the unprecedented situations following such viral outbreaks. Efficient preparedness relies on availability of efficient diagnostic, therapeutic or prophylactic capacities. Towards this, virus biology, pathogenesis and virus-host interactions must be thoroughly known. However, in cases of mutated strains or novel viruses, it is difficult to do so immediately and hence, alternative strategies must be explored. Advances in genomics technologies have uncovered the potential of molecular agents in disease biology. Enough evidence has been generated that strongly indicates regulatory roles of non-coding RNAs during viral infections. Non-coding RNAs have emerged as interesting diagnostic agents and therapeutic candidates. Owing to the capability of turning "on" or "off" the viral replication process, miRNAs have been regarded as direct switches of modulating viral infections. Also, long non-coding RNAs (lncRNAs) via interferon dependent or independent signaling have been crucial regulators of viral disease outcomes. Circular RNA is another type of non-coding RNAs with roles in viral infections. Identification of the non-coding RNA regulators can enable to combat challenges in management of viral infetions. Such essential knowledge can be beneficial to identify specific or broad-spectrum molecular targets for development of novel prophylactics, therapeutics or diagnostics.

IL-53

Identification and prediction of food-derived peptides using Machine learning based Anti-Hypertensive Peptide Predictor (AHPP)

Saugata Hazra[1,2]

[1]*Department of Biosciences and Bioengineering, Indian Institute of Technology, Roorkee, Uttarakhand 247667, India;*
[2]*Centre for Nanotechnology, Indian Institute of Technology-Roorkee, Roorkee, Uttarakhand 247667, India.*
email: saugata.iitk@gmail.com
saugata.hazra@bt.iitr.ac.in

Hypertension is a modern life crisis, affecting more than one billion people worldwide. The inhibition of Angiotensin converting enzyme I (ACE-I) is a well-known process of regulating blood pressure. However, long-term use of existing synthetic drugs for hypertension has shown side effects. Thus, new generation of drugs is required. In this regard, food-derived peptides have shown ACE-I inhibitory activities

and useful for determining functional food or design new therapeutics i.e.,peptidomimetics.
In this study, for successful identification and predicting potential anti-hypertensive peptides from food sources, the development of rigorous strategies by incorporating machine learning, and structural bioinformatics-based web server has been reported. The comprehensive Anti-hypertensive database of peptides has been curated from the in-detailed literature search and in-house experimental data. We have adopted an interdisciplinary approach, including the development of an in-silico prediction tool. This independent web server (AHPP: Anti-Hypertensive Peptide Predictor) can take input in FASTA format or through UniProt ID to perform the in-silico gastrointestinal digestion and then screen the resulting peptides for ACE-I inhibitory activity. This is a unique platform that provides the elaborated structural and functional features of the active peptides and their interaction with ACE-I which is essential to screening of peptides for therapeutic use. In addition to it, to determine inhibition potential of novel peptides, the prediction of IC_{50} value has been introduced in this server.
This web server will enhance the efficacy and reduce the time and cost in identifying and characterizing novel anti-hypertensive peptides from food proteins. It will help to predict the potential bioactive peptides which can act as a lead molecule in developing peptide like small molecules. Thus, enabling the development of a novel platform for food-based therapeutic alternatives for the prevention and management of hypertension. The web server can be accessed using URL: http://hazralab.iitr.ac.in/ahpp/index.php
Keywords: *Anti-hypertension, AHPP, machine learning, IC_{50}prediction.*

IL-54

Artificial Intelligence and Robotics - The Evolving Face of Healthcare Management and Future Challenges

Shantanu Panja

Dept of ENT - Head & Neck Surgery
Apollo Multispeciality Hospitals, Kolkata

Artificial intelligence is gradually becoming a transformational force in healthcare. Through machine learning algorithms and deep learning it is able to gather data, process it, and give a well-defined output to the end-user. AI programs are applied to practices such as diagnosis processes, treatment protocol development, drug development, personalized medicine, and patient monitoring and care. AI algorithms can also be used to analyze large amount of data through electronic health records for disease prevention and diagnosis. AI has established uncountable applications in medicine and one of it has been development of surgical robots.
This presentation aims to elaborate how AI and surgical robots are transforming surgery, the multitude use of AI in different sectors of medicine in regular practiceand also the present pitfalls with emerging challenges in the use of machine learning and Artificial Intelligence in health care.

Key words: Artificial intelligence, patient care, surgical robots

IL-55

Application of Machine Learning, Neural Networks, and Deep Learning in Eye care Innovations

Ramesh S Ve

Department of Optometry
Manipal College of Health Professions
[Earlier Known As- School of Allied Health Sciences (SOAHS)]
Manipal Academy of Higher Education (MAHE), Manipal, Karnataka, India.

Artificial Intelligence methods have shown to be a promising tool in the field of medicine and more so in ophthalmology and Preventive eye care. AI is a field focused on automating intellectual tasks normally performed by humans, Machine Learning and Deep Learning are specific methods of achieving this goal. AI also includes rule based algorithms and convolutional neural networks (CNN) approaches for enhanced image analysis. Our diabetic retinopathy Image Screening research has incorporated DL image analysis algorithm and reports the validity of this automated retinopathy screening system. In clinical validation on over 1400 diabetic retinopathy patients the Algorithm showed a sensitivity of 90.75 % (95CI 86.42, 94.62) and specificity of 97.75% (95CI 96.58, 98.60) respectively. Automated optic nerve head grading research incorporated CNN based concepts applied in staging glaucoma and shows accurate staging across fundus images of various quality. ML and DL methodologies are also applied in assessing visual field defects assessed using eye tracking and virtual reality

based vision therapy projects. In this presentation we cover AI based approaches in our eye care innovations and better explainthese concepts to a clinical audience with limited technical jargon.

IL- 56

Disparity in the Behaviour of Monocyte Subsets in Post-Traumatic Sepsis Patients

Dublu Lal Gupta[1]*, Ashok Sharma[2#], Kapil Dev Soni[3#], Sanjeev Bhoi[4#], D.N Rao[2#]

dnrao311@rediffamil.com
[1]Department of Biochemistry, All India Institute of Medical Sciences, Raipur, Chhattisgarh
[2]Department of Biochemistry, [3]Department of Intensive and Critical Care, JPNATC, [4]Department of Emergency Medicine, JPNATC,
[#]All India Institute of Medical Sciences, New Delhi, India

Post-traumatic sepsis remains a major public health problem across the globe, marked as the fourth leading cause of death among all diseases. Trauma patients who survived at initial stages in the Emergency Department (ED), have significantly higher chances of mortality due to sepsis in the ICU. Monocytes are important components of innate immunity that recognise the pathogens through the pattern recognition receptors and phagocytes them. They work as an antigen presenting cells, secretes cytokines, chemokines, and activates T helper cells. There is paucity of literature regarding the role of circulating monocytes subsets and development of sepsis complications following trauma haemorrhagic shock (THS). The study was conducted to investigate the circulating level of monocyte subsets (Classical, Inflammatory, and Patrolling) and its functions in patients with acute post-traumatic sepsis. A total 72, THS patients and 30 age matched healthy controls were recruited. Blood samples were collected at different time points on days 1, 7, and 14 to measure the serum levels of cytokines by Cytometric bead assay (CBA), for the immunophenotyping of monocytes subsets, and also for the cell sorting of monocytes subsets for the functional studies. The circulating levels of monocytes subsets were found to be significantly differs among THS patients, who developed sepsis when compared with others who did not. In conclusion, this study shows disparity in the behaviour of monocytes subsets in patients with acute post-traumatic sepsis.

Key words: Trauma haemorrhagic shock, Sepsis, Multiple organ failure, Cytometric bead assay

IL- 57

Chemokines and Chemokine Receptors in HIV-1 infection

Kalpana Luthra, Romsha Kumar, Vishwas Tripathi, Heena Aggarwal, Ambili Nair Pananghat

Department of Biochemistry, All India Institute of Medical Sciences, New Delhi 110029, India

The chemokine receptors CCR5 and CXCR4, present on immune cells, are coreceptors for HIV-1 infection. The chemokine SDF-1□/CXCL12 is a ligand that binds CXCR4 and also to CXCR7 (RDC-1). We evaluated the downstream signalling pathways mediated by CXCL12–CXCR7 interaction in Jurkat T cells and identified that phosphorylated ERK 1/2 is essential for chemotaxis and survival of T cells whereas activation of Akt promotes only cell survival. In addition, the CXCL12–CXCR7 interaction under normal physiological conditions did not activate the p38 pathway suggesting that CXCR7 promotes cell survival and does not induce cell death in T cells and that the CXCL12 signalling via CXCR7 may be crucial in determining the fate of the activated T cells. In another study conducted in early and term human placenta, we demonstrated a higher expression of CXCR7 in the term placenta as come to the early stage placental tissues. B Lymphocyte Stimulator (BLyS), expressed on dendritic cells (DCs), is a key regulator of B cell homeostasis. We evaluated alterations in innate and humoral immune responses by profiling DCs and B cell subsets and their modulatory effect on viral neutralizing antibody response and assessed the plasma levels of BLys in chronic HIV-1C infected children (long term non-progressors and progressors). High plasma levels of BLyS in progressors positively correlated with poor viral neutralizing activity. Interestingly on follow up, treatment naïve progressors, post-ART showed increase in resting memory B cells along with reduction in plasma BLyS levels that correlated with improvement in viral neutralization.

IL- 58

Biophysical and biochemical elucidation of methylglyoxal modified insulin and its role in immune response in type 2 diabetes mellitus patients

Moinuddin, Mohd Talha, Minhal Abidi, Safia Habib, Abdul Rouf Mir, Asif Ali

Department of Biochemistry, Jawaharlal Nehru Medical College, AMU, Aligarh
Email: moin_u@rediffmail.com
moinuddin.bh@amu.ac.in

Objective: Protein glycation leads to the formation of advanced glycation end products (AGEs) and encourages the development and progression of diabetic complications such as nephropathy, retinopathy and neuropathy. Hyperglycemia causes increased formation of methylglyoxal (MG), a highly reactive α-dicarbonyl compound and a potent glycating agent. This study has aimed to investigate the role of glycated insulin in type 2 diabetes mellitus (T2DM). Methodology: Insulin was glycated with methylglyoxal at 37 °C for 24 h, and the structural changes were analyzed by multiple spectroscopic techniques. Aggregation studies were undertaken by Thioflavin T assay and electron microscopy. LC-MS was applied to detect the formation of N^{ε}-(Carboxymethyl) Lysine (CML), while MALDI-TOF determined the change in mass upon glycation. Antibody binding and specificity was studied by enzyme linked immunosorbent and gel-shift assays.Result: MG modified insulin exhibited raised UV absorbance and AGE-specific fluorescence but decreased tyrosine fluorescence. CD and FTIR results showed reduction in α-helical content in glycated insulin. Increased ketoamine moieties and carbonyl content were also found. The glycation induced aggregation was confirmed by Thioflavin T assay and electron microscopy. CML formation and change in mass were also observed. Modified insulin generated high titre antigen specific antibodies in experimental animals which cross reacted with other glycated proteins. Circulating antibodies in T2DM patients exhibited higher binding with the MG modified insulin as compared to the native protein, indicating enhanced recognition of epitopes on MG modified insulin. Conclusion: Human insulin showed significant structural changes upon modification with methylglyoxal. Modified insulin was highly immunogenic in animals and we also report antibodies against the modified epitopes in T2DM patients. Our findings would pave way for a prospective cohort study to evaluate the role of glycated insulin in T2DM prognosis.

Keywords: Insulin, methylglyoxal, glycation, type 2 diabetes mellitus.

IL- 59

POTE, A Novel Cancer Testis/Germline Antigen with Strong Potential as a Target Forimmunotherapy against Cancers

Rasmi Gupta, Ashok Sharma

Laboratory of Chromatin and Cancer Epigenetics, Department of Biochemistry, National Cancer Institute-India, All India Institute of Medical Sciences, New Delhi.
Email: ashok.sharma@aiims.edu

Cancer immunotherapy is becoming an appealing and attractive strategy among different therapeutic options over the past years and has shown its power against malignancies. The relationship between the immune system and cancer has been extensively explored in numerous preclinical and clinical studies. Cancer/testis antigens (CTAs) are a group of tumor-associated antigens (TAAs) that display regular expression in the adult testis, an immune-privileged organ but aberrant expression in several types of particularly in advanced cancers. Some CTAs are immunogenic, such as BAGE, GAGE MAGE, NY_ESO-1, and POTE antigen, an excellent immunological target. The POTE gene family is primate-specific and expressed in Prostate, Ovary, Testis, Placenta, and cancers. The POTE family consists of 14 highly homologous paralogues dispersed among 8 different chromosomes: 2, 8, 13, 14, 15, 18, 21, and 22. A recent study from our lab showed that POTE gene is epigenetically regulated and has high expression in epithelial ovarian cancer. POTE gene regulation by DNA methylation, DNA-Methyltransferase (DNMT) inhibitors may augment POTE vaccine therapy. Because POTE belongs to the CT/CG antigen family and CT/CG antigen, it does not express in other tissue because the genome of differentiated cells becomes methylated. So AIM of this work: To study the effect of epigenetic modulatory drugs to augment the immunotherapeutic potential of POTE antigens to develop strategies for a vaccine against Ovarian Cancer. We hypothesized that: POTE antigen is anewly identified antigen family, belongs to Cancer-Testis/Germline antigens (CT/CG)

antigen, and is highly expressed in germ cells as well as in tumors. The germ cells, lacking the major histocompatibility complex (MHC) class I molecules, are considered immunologically privileged tissues. Due to their constrained expression pattern, POTE antigens may be desirable candidates for anti-tumor vaccines or active immunotherapies.

IL-60

Diagnosis of Primary aldosteronism

Samuel Vasikaran

Department of Clinical Biochemistry, PathWest Laboratory Medicine WA, Perth, Australia

Primary aldosteronism (PA) is probably the most common cause of secondary hypertension in middle aged adults. It is the autonomous excessive secretion of aldosterone that is important in maintaining blood pressure, along with electrolyte and fluid balance. Hypertension affects more than one third of the population. PA accounts for up to 10% of patients with hypertension, far more common than previously thought. Around two thirds of the cases are due to bilateral hypersecretion of aldosterone and a third are due to unilateral secretion due to an adenoma. Rare causes include inherited familial PA caused by a genetic mutation. The diagnosis and treatment of PA is important, as individuals who are affected are at a higher risk of developing heart disease and stroke. In addition, hypertension associated with PA can be curable in many cases. Patients who are most at risk for PA should be screened; those who have developed hypertension early in adulthood, those with family history, and those with severe hypertension and/or hard to control and patient with hypertension and low serum potassium or an adrenal mass found on imaging. This screening test, for PA is the aldosterone to renin ratio. If the ratio is high, then further testing for PA is warranted. Interference of aldosterone and renin measurements by medications and by hypokalaemia should be carefully considered and minimised. The common confirmatory test is the seated saline suppression test in which the patient is given two litres of saline intravenously over four hours. If aldosterone is suppressed bysaline, then PA is usually confirmed. Next step is to confirm unilateral aldosterone secretion by adrenal vein sampling in order to identify patients amenable to surgery. Adrenal vein sampling is a difficult procedure; however, point of care cortisol measurement in the theatre where the cannulation is done, is useful for confirming successful cannulation and improves the success rate. If unilateral secretion is confirmed, the off ending gland can be removed, which leads to cure of hypertension in at least half of patients. If hypertension has been long standing, surgery may not lead to a complete cure but usually there is an improvement in the hypertension, which makes it easier to manage after surgery. If PA is due to bilateral secretion, then the treatment is medical with the use of drugs such as aldosterone antagonists.

IL-61

Steroid Testing by LC-MS/MS for Diagnosing Adrenal Disorders

Ravinder J Singh

Endocrinology Laboratory and Laboratory Medicine and Pathology Mayo Clinic, Rochester, MN.

Mayo clinic is performing 20 million tests per year for patient care. The tests include most of the endogenous electrolytes, minerals, proteins, steroids amino acids etc. Most of these are endogenous or drug metabolites and proteins/peptides and these targets have been known as biomarkers for decades. The development and validation of these assays has been challenging and the methodologies involved vary form radioimmunoassays, chemiluminiscence sandwich immunoassays, protein electrophoresis, spectrophotometric and chromatographic techniques. Chromatographic techniques like HPLC, and GC and accompanied by various detectors like UV, electrochemical and mass spectrophotrometers. GC-MS, LC-MS, LC-MS/MS are now commonly used in clinical laboratories but are not approved by FDA for clinical laboratories. Burden lie on the clinical laboratories to extensively validate analytically for established and novel biomarkers. Novel requirements are that both vendors and clinical laboratories should also demonstrate the clinical utility of these assays. During the presentation I will share the experience of Mayo clinic for the process of validating biomarkers for clinical use.

IL-62

PCOS and Its Biochemical Correlation

Manidip Pal

Dept of Obstetrics and gynaecology College of Medicine & JNM Hospital, WBUHS; Kalyani

Polycystic Ovarian Syndrome (PCOS) is a hyperandrogenic disorder of women resulting in oligo /anovulation. PCOS is frequently associated with obesity, abdominal adiposity, insulin resistance, metabolic disorders and cardiovascular risk factors.

Biochemical correlation:

Diagnostic correlation -

1. Malondialdehyde (MDA), an oxidative stress biomarker, is increased in both type PCOS indicating the excessive ROS activity.
2. Leptin and adiponectin have strongest correlation with Free androgen index (FAI) in adult women with PCOS.
3. In PCOS offspring inflammatory biomarkers (MMP-9, S100A8) are increased, suggesting that these children may exhibit increased chronic low-grade inflammation.
4. Metabolomics –
   Lipid metabolism: ↓ Cholesterol, HDL,α-tocopherol, Phosphatidylcholine, ↑ Linoleic acid, Lipoprotein, Unsaturated fatty acid, VLDL/LDL, Free Fatty acids, Triglyceride etc.
   Amino acid metabolism: ↓ Arginine, Glutamate, Glycine, Histidine, ↑ Tryptophan, Tyrosine, Threonine, Valine, ↑ ↓ Leucine, Isoleucine
   Purine metabolism: ↑ Uric acid, Cyclic GMP
   Androgen metabolism: ↑ DHEAS, androsterone sulphate, dihydrotestosterone sulphate
   Fatty acid metabolism: ↑αlinolenic acid, Eicosapentaenoic acid
   Pyruvate metabolism: ↑ Fructose
   TCA cycle metabolism: ↓ Citrate, ↑ Acetate
   Gluconeogenesis/Glycolysis: ↑ Lactic acid, Lactate
   Energy metabolism: ↑ ↓ Glucose
   Glucose metabolism: ↓ Glycerol, ↑ Pyruvate
   Arachidonic acid metabolism: ↑ $PGF_{2\alpha}$

Therapeutic correlation -

1. Weight reduction can benefit obese women with PCOS through reduced adiposity, androgen levels, insulin levels, improved ovulatory function, increased fertility and reduction in the overall risk of CVD.
2. Standard treatment –
   Insulin sensitizer: ↓ Hepatic neoglucogenesis ↑ Insulin sensitivity – Biguanides (Metformin), Thiazolidinedione (Pioglitazone)
   Statins: ↓ Choesterol synthesis (Atorvastatin)
   Gliptins:Dipeptidyl peptidase-4 inhibitor (Sitagliptin, Linagliptinetc)
   Myoinositol: ↑ SHBG resulting in ↓ hyperandrogenism
3. Newer treatment –
   Oxidative phosphorylation inhibitor: Imeglemin
   SGLT-2 inhibitor –Empagliflzin, Dapagliflozin, Canagliflozin
   Triple GLP-1/GIP/glucagon agonist-weight loss, ↓ plasma glucose and cholesterol
4. *n*-3 polyunsaturated fatty acids (PUFA)-Improvement occurs via its anti-obesity, glycemic and hormonal hoemostasis, anti-inflammatory, regulation of adipokine production and enhancement of endothelial function.

IL-63

Is Therapeutic Drug Monitoring Irrelevant in the Era of Personalized Medicine?

Amitava Dasgupta

Professor of Pathology and Laboratory Medicine
Division Director: Laboratory medicine
University of Texas McGovern Medical School at Houston

Therapeutic drug monitoring (TDM) and pharmacogenomics testing are both clinical laboratory based methods for supporting pharmacotherapy. Pharmacogenomics testing is a genotype approach while therapeutic drug monitoring is a phenotype approach in personalizing medicine.The goal of pharmacogenomics is to determine dosage of a drug prior to therapy based on polymorphisms of drug

metabolizing enzymes (mostly CYP2D6, CYP2C9, CYP2C19, N-acetyltransferase, thiopurine-S-methyltransferase and UDP-UDP-glucuronyl transferase), transporters (P-glycoprotein/ MDR1) and/or receptors that ultimately determine the outcome of drug therapy. However, traditional therapeutic drug monitoringis useful in individualizing dosages when there is altered pharmacokinetics of a drug due to a disease or in infants as well as elderly patients and pregnant women. Recent research indicates thatpharmacogenomics testing holds promise of improving therapeutic outcome during therapy with warfarin (polymorphism of CYP2C9 and VKORC1), anticancer drugs, opioid pain management (polymorphism of CYP2D6), immunosuppressants (polymorphism of CYP3A5 and MDR1), antiretrovirals, and psychoactive drugs. However, TDM is inexpensive while pharmacogenomics tests are expensive. A practical approach where pharmacogenomics tests are really useful (therapy with warfarin, tamoxifen etc) and where TDM is satisfactory will be discussed in the session with emphasis on free (unbound) drug monitoring and unique application of therapeutic drug monitoring in identifying clinically important drug-herb interactions.

IL-64

Gene-Environment Interaction as Possible Biomarker for Etiology of Diseases

B. D. Banerjee

Environmental Biochemistry & Molecular Biology Laboratory
Department of Biochemistry, University College of Medical Sciences & GTB Hospital,
University of Delhi, Delhi, India, 110095
Email: banerjeebd@hotmail.com

India has one of the leading positions among the largest producers of food in the world, partly due to the use of pesticides to control the insects, weeds, and other organisms that attack crops. However, their unregulated and indiscriminate applications have raised serious concerns about the entire environment in general and the health of humans. Pesticides cause serious health hazards to living systems because of their rapid fat solubility and bioaccumulation in non-target organisms. Even at low concentration, pesticides may exert several adverse effects, which could be monitored at biochemical, molecular or behavioral levels. Due to long residence time of these substances, there is a great interest in examining their presence in the environment. Endocrine disruption, altered immune surveillance, inflammation and subsequent oxidative stress are few among the mode of action of these pesticides. Although environmental chemical exposures are important, genetics clearly plays a role in the etiology of adverse health outcomes. Identification of genetic susceptibility variants will lead to better understanding of the role of variable factors in adverse health outcomes. It can be hypothesized that genetic polymorphism requires the presence of certain environmental stimuli to have consequences of clinical significance. The recent abundance of epidemiologic research examining associations between polymorphic genes that code for enzymes involved in chemical biotransformation like CYP450/GST family and disease has on occasion generated interesting findings. Recent studies from our laboratory clearly showed the importance to assess the role of variations in the human genome (polymorphisms) in modifying the effect of exposures to environmental chemicals to define "Gene–Environment Interaction", which render some individuals or groups in the population more or less likely to develop adverse health effect . Current and future efforts to identify new polymorphisms in genes involved in environmental response with larger sample size will broaden the scope of potential genetic effect modifiers. Currently, our laboratory is involved in studying the role of "Gene-Environment Interaction" with reference to environmental chemical metabolism and oxidative stress related genes in various diseases such as cancer, neurodegenerative diseases, chronic kidney disease, hypospadias, etc. Our laboratory has reported the association of organochlorine pesticides (OCPs) like α-HCH, β-HCH, γ-HCH and p,p-DDT (range 1.02–11.0, 1.34–32.0, 1.21–21.56 and 0.99–7.18 ppb respectively) with many of adverse health outcomes such as prostate cancer, urinary bladder cancer, ovarian cancer, birth defects, preterm birth, intrauterine growth retardation, recurrent miscarriage etc. Our effort in this area may also lead to the development of possible biomarker(s) to screen individuals, exposed to environmental chemicals and preventive measures for safe health outcomes and generating various preventive measures to minimize the pathogenesis by taking necessary steps based on genetic

counseling to such families. In conclusion, determining the effect of genetic variants of xenobiotic metabolizing enzymes along with OCPs burden will be of paramount importance in an early diagnostic strategy and preventive measures for adverse health outcomes with reference to environmental chemicals as published extensively from this laboratory during last 3 decades, same will be discussed during presentation or interactive sessions.

IL- 65

Pediatric Toxicology: Children are Not Little Adults

Uttam Garg

UMKC School of Medicine
Department of Pathology & Laboratory Medicine
Children's Mercy Kansas City

Pediatric toxicology is unique. The toxicological effects can beginfollowing in-utero fetal exposure to drugs and toxins ingested by the pregnant women. Newborns are prone to higher toxicological effects due to their unique physiology such as rapidly growing nervous system, immature liver, decreased renal clearance, low gastric pH and higher skin absorption. As children grow, the trends in drug exposure change with age. Most exposures in younger children are unintentional and involve common household items like cleaners and cosmetics. Older children/teenagers are prone to intentional ingestion of legal and illegal drugs.Clinical laboratory plays an important role in drug overdose diagnosis and patient management. Immunoassays and chromatographic methods are commonly used techniques in the identification of toxins. With the everchanging landscape of new illegal drugs, keeping drug screening current is a great challenge for the clinical laboratories.

IL-66

High Impact initiatives that improve laboratory utilization

Ed Randell

Clinical Chief and Professor,
Lab. Medicine, Eastern Health Authority & Faculty of Medicine, Memorial University
Rm 1J442 Laboratory Medicine, Eastern Health, St. John's NL, Canada

Trends in world events, the need social accountability, the advent of health care innovations, rising costs and limited resources, evidence-based and value-driven laboratory medicine, are all drivers of the need for greater accountability in usage of laboratory services. Laboratory professionals are the experts for determining the value of individual laboratory tests and testing processes. Laboratory professionals must also become leaders in developing and implementing policy to improve value and cost-effectiveness for the services provided in improving patient outcomes. Helpful to the organization of activities around utilization is a suitable multidisciplinary advisory framework. Various laboratory driven initiatives are implemented to address the above challenges and to demonstrate accountability for wise use of healthcare resources. Some initiatives work better than others. We will present several common approaches focusing on minimal reorder intervals, restriction of low value tests, carful design of laboratory test requisitions, redefining test panels, vetting referred out work, use of Lab-based algorithms and reflexive testing strategies, physician report cards, and the use of laboratory test formularies for useful and funded services following evaluation of new tests. These will be illustrated using examples and focusing on improving patient outcomes. During this session we aim to provide the participant with 1) ways to improve laboratory testing processes to increase chances for better outcomes in patients; 2) reduce unnecessary costs related to laboratory testing; and 3) knowledge of supporting infrastructure required to develop and maintain programs that improve laboratory test usage.

IL-67

Expanding Opportunities for Medical Laboratory Scientists in Improving Laboratory Value

Raja Elina

Raja Aziddin Drug & Research Lab, Pathology Department, Jalan Pahang, 50586, Kuala Lumpur, Malaysia

Laboratory medicine is integral to many clinical decisions in prevention, diagnosis, treatment and managing disease of patients. It touches more lives than any other clinical service. However medical laboratories have poor visibility as a medical discipline and as a profession. The focus of medical laboratories has been on improving and maintaining analytical quality. Although analytical quality is an essential prerequisite of laboratory test value, a growing body of evidence demonstrates that clinical benefits can be achieved only by focusing on the total testing process. Medical laboratory scientists have over the years directed their efforts to improving laboratory value by conducting cost-effective laboratory operations that are focused on efficiency. These include the processes and events that occur within the boundaries of the laboratory from preanalytical processing to resulting. Advances in analytical and information technology have given opportunity to medical laboratory scientists to make improvements in the productivity of laboratories. Although this has contributed to improvements in patient care, it has also led to a focus on the analytical activities and costs within the laboratory itself rather than a broader consideration of the impact of testing on patient care. In addition to focussing on efficiency, medical laboratory scientists today can further improve laboratory value by practicing laboratory medicine that focuses on effectiveness. This is concerned with processes that occur beyond the boundaries of the laboratory which includes test selection, test utilization and test interpretation. Medical laboratory scientists have access to data that can provide useful insights into clinical practice and identify gaps in care. They can take an outcome-based approach to generate useful knowledge to reduce costs and improve patient care. They can learn about recent developments, listen to the suggestions and requests from users, network and practice effective communication with a wide range of stakeholders. As the importance and true impact of laboratory medicine can only be demonstrated by their effectiveness in influencing the management of patients and related clinical outcomes, medical laboratory scientists should embrace the value-based health care (VBHC) concept and play an important role in navigating laboratories to transition from volume to value-based care.

IL-68

Usıng Laboratory Data and Informatıcs to Improve Test Utılızatıon and Management

Merve Sibel Gungoren, MD, PhD, EMBA
Duzen Laboratories Group, Turkey

Increasing medical expenses throughtout the world necessitate more reasonable utilization of all healthcare resources, as well as clinical laboratory tests. Managing test requests is an emerging topic in the field of clinical laboratory management. Test requests which do not base on solid medical evidences increase financial burden of healthcare system. Moreover, unexpected results of unnecessary tests create many issues for both physicians and patients. Utilization management is a part of continuous improvement in clinical laboratories. Laboratory leaders are expected to be more proactive about test utilization.

The aim of this session is to address the potential benefits of laboratory data and informatics tools for test utilization management.
Participants will be informed about

- The use of real-time data in utilization improvement process
- Examples of data analytics tools to measure the impacts of the utilization interventions
- The use of information systems, middlewares and decision support systems to improve test utilization
- Potential use of machine learning techniques in utilization improvement process.

IL-69

Value based Laboratory Medicine Practice: Oppurtunities and Challenges

Praveen Sharma

Department of Biochemistry,
All India Institute of Medical Sciences,
Jodhpur - 342005, India
Chair – IFCC-CLM

Value-based laboratory medicine is one of the most promising approaches towards providing quality laboratory care at affordable costs. This relies on giving value by outcomes achieved per rupee spent. The best value is given by shared benefits between all the stakeholders associated with the laboratory workflow: patients, providers, suppliers, payers and citizens. Adding value to laboratory medicine is the responsibility of the management, and it can be done at local, national and international levels. Medical laboratory's aim should not be limited only to provide accurate results, but doing the right thing in the right patient, within a meaningful timeframe, and as regards clinical management, using appropriate laboratory procedures and with a respect for ethics, confidentiality, value and the safety of the patient. Implementation of value based laboratory medicine practice is a current challenge for laboratory management as they may find it difficult to adapt their organization into a patient-centered diagnostic pathway based on both classical outcomes and innovative patient-evaluation. Laboratory medicine is achieving increasing importance, by generating useful knowledge to reduce costs and improve patient care, along with a complementary relationship with clinicians for an overall cost-effectiveness. Laboratory professionals need to emphasize the importance of laboratory data supported by strong evidence to improve diagnostic and prognostic traditional thinking. Introducing value based laboratory medicine would be useful to achieve better skills on cost calculation, multidisciplinary harmonization, data plan, comparable procedures, quality control, and individual-specific management. The assessment of added value in laboratory medicine will require evaluation in several dimensions like operational efficiency, patient management and behaviours.

SL-1

Second Generation Basal Insulin-A New Benchmark for Redefining Glycemic Control

Abhijit Das

Dept of Pharmacology, Burdwan Medical College Burdwan

Proper glycaemic control is really a challenge to the physician for managing Type2 Diabetes mellitus. Basal insulin has an immense role in reaching glycaemic target, specially in patients who could not reach target with multiple OADs or drug naive patient presented with HbA1C>9%. Among the basal insulins – NPH, Glargine U-100, Detemir, Degludec, Glargine U-300, the last two are considered the second generation basal insulin. While we put up any patient on insulin we mainly concerned about two things – HbA1C reduction and hypoglycaemia (anytime and nocturnal).EDITION trials showed that noninferiority of Glargine U-300 in comparison to Glargine U-100 regarding HbA1C reduction. But there is significantly lower incidence of anytime and nocturnal hypoglcaemia with Glargine U-300. BEGIN trials showed thatnoninferiority of DegludecU-100 in comparison to Glargine U-100 regarding HbA1C reduction. There issignificantly lower incidence of nocturnal hypoglcaemia with Degludec but similar incidence of nocturnal hypoglycaemia with these two insulins. There are two goodtrials that compare efficacy and safety among second generation basal insulins. BRIGHT study – a multicenter, open-label, 1:1 randomizedactive controlled, 2-arm parallel-group, non-inferiority study in adult participants with uncontrolled T2DM (HbA1C 7.5% to 10%) showed no difference among Galgine U-300 and Degludec U-100. But there is lesser incidence of anytime hypoglycaemia and nocturnal hypoglycaemia with that of Glargine U-300 than that of Degludec U-100. Conclude study – an open-label randomized, active-controlled, 2-arm parallel-group, multicentre study comparing Degludec U-200 vs Glagine U--300, in Europe and North America. The aim of the trial is to compare the safety and efficacy among these two insulins. It showed similar efficacy but nocturnal symptomatic hypoglycaemia is lesser with Degludec U-200, but diurnal symptomatic hypoglycaemia is lesser with Galrgine U-300. Considering all the trials, we may conclude that second generation basal insulins specially the Glargine U-300 has an edge to reach the target HbA1C in a safer way.

SL-2

Dapagliflozin- Current Perspectives and Future Outlook

Deblina Sarkar

Dept of Community Medicine, College of Medicine& JNM Hospital, Kalyani

Dapagliflozin is considered to be wonder drug which not only low the propensity for hypoglycaemia but also found to be effective in heart and kidney disease. It prevent the development of heart failure and can be used in patients with reduced ejection fractions both with and without T2DM. Dapagliflozin reduces the intra-glomerular pressure and may protect the kidney function in patients without diabetes. It reduce glucose, weight and BP with possible neutral effect on lipids and thus modify three CV risk factors. It results in daily urinary excretion of ~ 70g and causes significant reduction in HbA1c.

SL-3

The Position of Gliclazide and Metformin FDC in the Evolving Landscapes of T2DM Management

Abhishek Ghosh

Dept of Pharmacology, College of Medicine & JNM Hospital, Kalyani

When deciding on a treatment strategy for diabetes, it is essential to consider both patient and drug specific characteristics. Suphonylureas can be one of the safe and effective options in navigating towards euglycemia. Newer drug classes like gliptins/ gliflozins have CV outcome trials and are considered CV safe but trail behind SUs in terms of glycemic efficacy. Physicians have to continuously balance between efficacy and safety to reach the desired glycemic control. Although gliclazide has the risk of mild hypoglycaemia, and small weight gain, it is preferred in patients with type 2 Diabetes mellitus patients because of its sustained glycemic efficacy , unique end stage kidney disease prevention and CV safety at lower cost. Its fixed dose combination with metformin increases glycemic efficacy minimises chance of weight gain and improves patient compliance significantly.

SL-4

First Metformin + SGLT2 i+ DPP4i FDC in India: Clinical Development and Clinical Relevance in Indian T2DM Management

Abhishek Ghosh

Dept of Pharmacology, College of Medicine & JNM Hospital, Kalyani

Remogliflozin, a newer SGLT2 Inhibitor, based regimen has improved access to newer therapies for Indian T2DM patients. Early triple regimen is seen to provide opportunity pf higher glycemic reduction. A fixed dose combination of Metformin, with SGLT2 inhibitor (Remogliflozin) and DPP4 inhibitor (Vildagliptin) was contemplated as potential solution for Indian T2DM patients. This combination was observed to provide early and consistent glycemic reduction. There is also significant extraglycemic benefit like weight reduction and BP reduction. Triple therapy is not observed to be associated with any additional safety risks and offers low hypoglycaemic risk. All the findings have been found to be comparable to triple drug regimen of Metformin-Empagliflozin-Linagliptin, which has been approved earlier but having much higher cost, with demonstrated non inferiority in glycemic reduction. This triple drug will improve patient compliance and will address most of the pathways of ominous octet in diabetes pathophysiology and will achieve glycemic target early and thus can prevent multiple complications of diabetes.

Sita Devi Award Category

Flowcytometry Based Assay of Platelet Activation Markers among Type 2 Diabetes Mellitus Subjects with and Without Depression

Shyamkrishnan R, Gautom Kumar Saharia, Debapriya Bandyopadhyay, Suravi Patra, Binod Kumar Patro*

*Department of Biochemistry, *Department of Community Medicine and Family Medicine*
AIIMS Bhubaneswar
E-mail: shyamkrishnanrknr@gmail.com

Objectives: To differentiate the inflammatory state among individuals of diabetes with depression, individuals of diabetes without depression and healthy controls. Methodology: A total of 114 participants were recruited for the study from Non-Communicable Disease prevention clinic at AIIMS, Bhubaneswar. Each study group contained 38 participants in diabetic group, diabetics with depression group and age and sex matched control group. Diabetes was diagnosed with the ADA criteria. Screening of Major depressive Disorder was done with PHQ2 questionnaire and severity assessed with HAM-D scale. The biophysical profiles of participants were recorded. Platelet markers CD41, CD42b, CD62P and CD63 were assayed using flowcytometer. Hs-CRP levels and insulin levels were assessed in all participants. Results: Platelet count, surface expression of platelet activation markers CD62P and CD63, concentrations of hs-CRP and insulin and HOMA-IR score differed significantly between the 3 groups. Post hoc analysis showed that CD63 expression was significantly high in patients with comorbid diabetes and depression compared to those having diabetes without depression. There was a significant positive correlation of CD62P expression with insulin levels and HOMA-IR score. CD63 expression showed significant positive correlation with hs-CRP and insulin concentrations and HOMA-IR score. Conclusion: Patients with comorbid diabetes and depression have enhanced platelet hyperactivation along with a proinflammatory state in their body. Platelets could be targets of therapeutic interventions for the prevention of vascular complications in these patients.

Keywords: T2DM, Depression, Platelet

Targeting AURKA signalling by Aspirin: Novel Strategy to Prevent Fuelling of Radioresistance in Cervical Cancer

Salini Das, Madhumita Roy and Sutapa Mukherjee

Department of Environmental Carcinogenesis & Toxicology
Chittaranjan National Cancer Institute, Kolkata
Email: sutapa_c_in@yahoo.com
salinidas1992@gmail.com

Background: Chronic-administration of Ionizing radiation stimulates acquirement of radioresistance in cervical cancer cells, instigating increased survivability, better migration/invasion and promotes tumour progression and disease relapse. Objective: Exploring the role of AURKA in development of radioresistance in cervical cancer and effect of low dose Aspirin with a purpose to improve radiosensitivity by targeting AURKA. Methodology: Cervical squamous cell carcinoma cell line SiHa, radioresistant subline SiHa/RR (developed by weekly irradiation), parental SiHa overexpressed with AURKA were treated with Aspirin (5μM) prior to irradiation. Radiosensitivity was assessed by colony forming, viability, would healing-sphere forming assays. Aspirin- AURKA interaction was examined by in-silico docking analysis (DNA and protein). Spectrophotometric and spectrofluorimetric analysis of Aspirin conjugated DNA and protein was performed from all three cell lines. The effects of Aspirin at AURKA signalling were inspected by western blot and RT-PCR assays. Apoptotic assays were carried out in Aspirin treated irradiated cells to check the efficacy of this drug as a radiosensitizer. Result: Reduced number of colonies and restrained wound healing capacities were observed in in Aspirin treated cells. Aspirin showed efficient DNA and protein binding ability both in the docking results and the spectrophotometric and spectrofluorimetric data. Aspirin suppressed the expression of AURKA along with its transcriptional activators HIF1α, cmyc; downstream molecules NF-κB , Akt (evident from western blot analysis). Aspirin treated cells were killed even at the lower doses of radiation as found from the apoptotic assay. Conclusion: Administration of low-dose Aspirin may act as radioreversal agent to increase radiosensitivity by negatively regulating AURKA.

Keywords: radioresistance, AURKA, Aspirin, Cancer

Exploring the Role of ADAMTS13 in Regulating the Angiogenic Potential of MSCs under Stress Condition

Srishti Dutta Gupta and Malancha Ta

Department of Biological Sciences, Indian Institute of Science, Education and Research (IISER), Kolkata
E-mail: srishti1996.SDG@gmail.com

Background and Objectives: Mesenchymal stem cells (MSCs) play a vital role in regenerative therapies because they possess immunomodulatory properties. They are known to facilitate angiogenesis via secretion of trophic factors; and promote neo-vascularization. Post-transplantation, MSCs may encounter harsh micro-environmental conditions like nutrient deprivation, hypoxia and inflammatory milieu. Our study is focused on understanding the angiogenic potential of MSCs, in-vitro, in response to such stresses. Methodology: MSCs were isolated from human umbilical cord samples. PCRs and Western blotting techniques were used for studying expression of mRNA and proteins, respectively, under inhibitor-based and siRNA-mediated knockdown studies. Results: ADAMTS13, a protease known for cleaving the Von-Willebrand factor, is mostly known for its pro-angiogenic functions. In our studies with human umbilical-cord MSCs, we found that ADAMTS13 is upregulated under serum-deprivation condition. Correspondingly, potent pro-angiogenic markers like VEGF and PDGF are also noted to be upregulated. siRNA-mediated knockdown of ADAMTS13, under serum-deprivation, showed a considerable downregulation in expression of VEGF and PDGF, hinting that ADAMTS13 might play a role in regulating their expression. Inhibition of the JNK pathway, under serum-deprivation showed a downregulation in expression of ADAMTS13, VEGF and PDGF suggesting that JNK pathway might be acting as a positive regulator in their expression. Consequently, inhibition of PI3K and p38 pathways, showed a further increase in ADAMTS13, VEGF and PDGF under serum-deprivation, suggesting that these pathways might be acting as negative regulators. Conclusion: Our studies indicate that ADAMTS13 might be acting as a modulator of angiogenesis via involvement of JNK, PI3K and p38 pathways.

Keywords: Mesenchymal stem cells, angiogenesis, ADAMTS13

PS Murthy Award

In vivo Radioprotective activity of *Trianthema portulacastrum*

Uttam Das, Tanmay Saha, Subir Kumar Das

College of Medicine and JNM Hospital
email-uttambcku@gmail.com

Objective: *Trianthema portulacastrum* is a well-known medicinal plant with known hepatoprotective activity against chemical induced toxicity. Methodology: In this study radioprotective activity of *T. portulacastrum* was evaluated through Swiss albino mice survival assay and confirmed by histopathology of liver and jejunum. The mechanism of protection was evaluated by endogenous colony forming assay, bone marrow cell count, measuring the membrane integrity and antioxidant enzymes of organs such as liver, spleen and kidney. Results: It was found that the extract increases the mice survival rate, which was 20% at higher concentration. Post radiation histopathology of liver revealed loss of normal architecture in the form of hepatic sinusoid dilation and neutrophilic infiltration. Similarly jejunum showed distorted structure of villi in irradiated mice. Five days pre-treatment with *T. portulacastrum* restores the impact of radiation in dose dependent manner. Further, increased spleen colony number and augmented number of bone marrow cells in pre-treated and irradiated mice strengthen the protective activity of *T. portulacastrum*. Treated group of mice also showed ~~the~~ increased number of antioxidant enzymes present in tissue homogenates of liver kidney and spleen compared to non-treated controls. *T. portulacastrum* dose dependently protects the membrane of tissue which was measured through lipid peroxidation. Conclusion: This property of the plant can further be evaluated and may be considered for drug development.

Keywords: Antioxidant, Radiation, Survival

Reversal effect of PEITC on PI3K/Akt Signalling Mediated Cisplatin Resistance in Cervical Cancer

Elizabeth Mahapatra
Madhumita Roy & Sutapa Mukherjee.

Department of Environmental Carcinogenesis & Toxicology,
Chittaranjan National Cancer Institute,
37, S. P. Mukherjee Road, Kolkata- 700 026.
E-mail: elizabeth94mahapatra@gmail.com

Background: Reduced intracellular platinum (Pt) accumulation due to upregulated prosurvival signalling mediated drug-efflux is a major hindrance in (Pt)-based chemotherapy for cervical cancer treatment. 'Phenethylisothiocyanate (PEITC)', a natural isothiocyanate can be employed for targeting such signalling for enabling drug-accumulation. PEITC, known to induce oxidative-stress mediated apoptosis in cancer cells is reported to accumulate better in resistant cancer cells which express multi-drug resistant (MRP2). Therefore, researches for establishing PEITC as less-toxic chemosensitizers are on rise. Aim: Exploring the role of PEITC in promoting cisplatin-sensitivity among resistant cervical-cancer cells (in vitro: SiHaR; in vivo: cervical-cancer bearing Swiss albino mice) Methods: SiHaR was developed from SiHa by 'pulse treatment' with cisplatin followed by subjection of the in vivo cervical cancer model to three cisplatin-chemocycles. Both models were characterized for Akt/ ph-Akt (Thr308), NFκB (p50/p65), XIAP, survivin and MRP2 expressions (western-blotting/IF/qPCR) in presence or absence of PEITC pre-treatment. PEITC dose-response (in vitro: MTT assay/CSA; in vivo: histology/IHC/survivability) was determined. ROS generation (FACS/IF), mitochondrial-membrane status (rhodamine123-accumulation) identification and spectrophotometric estimation of GST/GSH levels were undertaken. Intracellular cisplatin-uptake (FAAS) was quantitated in relation to drug-DNA adduct retention potential (FACS/ IF). Results: SiHaR cells exhibiting poor cisplatin-retention highly expressed ph-Akt (Thr308), NFκB, XIAP, survivin and MRP2 proteins/mRNAs which decreased upon PEITC pre-treatment. They generated higher-ROS following mitochondrial-membrane potential alterations. GSH levels of SiHaR inversely correlated with drug-retention capacities. In in vivo models, cisplatin treatment after PEITC-shots remediated cervical histology and survivability. Conclusion: PEITC effectively abolished the drug resistant mechanisms by restoring cisplatin-retention capacities through regulating PI3K/Akt axis.

Keywords: PEITC, chemosensitization, chemoresistance, cervicalcancer

Comparing the effects of cinnamaldehyde and eugenol in collagen induced arthritis

Somaiya Mateen, Summayya Shahzad,
Shagufta Moin

Department of Biochemistry, Jawaharlal Nehru Medical College, Faculty of Medicine, Aligarh Muslim University, Aligarh, India
Email id: smateen.amu@gmail.com

Objectives: The present study was done to compare the effects of cinnamaldehdye and eugenol on severity of arthritis in CIA rat model in terms of joint swelling, cartilage damagae and bone erosion. Moreover, markers of oxidative stress and inflammation were also monitored in treated and untreated rats. Methods: Female wistar rats were immunized with type II collagen and treated with cinnamaldehyde and eugenol in order to observe its anti-arthritic potential. The effect of treatment was monitored by clinical scoring, cytokines level, biochemical markers, radiological examination and histological evaluations in the joints. Results: Cinnamaldehyde and eugenol were found to decrease the severity of arthritis in rats as evidenced by decreased paw swelling, arthritis index and organ indices. The changes were found to be more prominent in eugenol treated group. Histopathological and radiological examination revealed decreased cartilage damage and bone erosion in the treated group. Similarly oxidative stress markers (reactive oxygen and nitrogen species, markers of protein, lipid and DNA damage), enzymatic and non-enzymatic antioxidants) and inflammatory cytokines (TNF-α, IL-6, IL-10) were also ameliorated in treated groups, with the amelioration being more significant in eugenol treated arthritic rats. Scanning electron microscopy further revealed reduction in oxidative stress in the treatment group. Conclusion: Eugenol was more effective than cinnamladehyde in managing cartilage damage, bone erosion, oxidative stress and inflammation in rats. Therefore, these compounds may be used as an adjunct to the currently available anti-rheumatic drugs for the management of RA.

Keywords: Rheumatoid arthritis, cinnamaldehyde, eugenol, oxidative stress, inflammation

Dynamics of anti SARS Cov2 IgG Antibody Response in Health Care Workers: A Prospective Cohort Study from India

Sonam Singla, Vyoma Singh,
Smita Sarma, Charu Yadav,
Kamini Vinayak, Teena Wadhwa,
Renu Saxena, Yatin Mehta

Department of Laboratory Medicine & Infection Control, Medanta-the Medicity, Gurugram, Haryana. Pin-122001, Email: drcharuy@gmail.com

Objectives: To analyse COVID-19 antibody response, duration of protection, half-life kinetics and its association with disease severity in health care workers (HCW's). Methodology: Prospective cohort study conducted in 230 HCW's of a 1250-bedded tertiary care hospital in India. Baseline IgG antibodies estimated and followed up for RT-PCR positive infection. Seropositive HCWs were followed up with serial titres every 45 days uptil 6 months. Statistical analysis: SPSS ver. 22.0 used employing chi-square test for association of seropositivity with PCR outcome. Assuming log-normal distribution of antibody-titres, half-life estimated using linear regression model. Adjusted risk ratio was computed for incidence rate in baseline seronegative versus seropositive cases. Results: Seroconversion rate was 93.8% in seropositive HCWs at 30 days post infection. Incidence rate of infection was 12.96 (in seronegatives) and 1.29 (in seropositives) per 10,000 person days. Adjusted risk ratio was 8.12 (95% CI 1.068 61.755, p<0.001). Incidence of future infection was inversely associated with baseline seropositivity (p=0.018) with spike in infectivity seen during Aug-Sep 2020 and again in Nov.2020. A peak in mean titres seen at 46-90 day follow-up followed by steep decline till 135 days and gradual waning till 180 days. Median half-life was 125 days (62-155 days). 95.7% seropositive cases sustained seropositivity till the end of study and only 2 asymptomatic ones demonstrated complete sero-reversion. Conclusion: Dynamics of humoral immune response revealed an 8-times higher risk of infection in seronegative HCW's. Anti SARS CoV2 IgG antibodies persist for at least 6 months post-infection, offering significant protective immunity against reinfection.

Keywords: SARS CoV2 antibodies, healthcare workers, COVID-19

Diabetes and Periodontitis: Role of Glycation and Inflammation

Minhal Abidi[1*], Afaf Zia[2], Afshan Bey[2], Moinuddin[1]

[1]Department of Biochemistry, Aligarh Muslim University, Aligarh 202002
[2]Department of Periodontology, ZA Dental College, Aligarh Muslim University, Aligarh 202002
*Email: mnhlabidi@gmail.com

Objective: The possible role of native low density lipoprotein (LDL) and glycated LDL in type 2 diabetes mellitus (T2DM) and periodontitis (PD) as well as in T2DM+PD patients has been evaluated. Method: The conformational changes in LDL isolated from T2DM+PD, T2DM and PD patients were studied by physicochemical techniques followed by biochemical assessment. Sera from T2DM+PD, T2DM and PD patients were screened for the presence of antibodies against MGO-LDL. Results: To ascertain the specificity of auto-antibodies from T2DM+PD, T2DM and PD patients, competitive inhibition ELISA studies were done on IgG isolated from the sera of these patients. The samples of isolated IgG from T2DM+PD, T2DM and PD showed very strong recognition of MGO-LDL in comparison to the healthy counterpart. The specificity and affinity of auto-antibodies towards MGO-LDL was further confirmed by gel retardation assay. LDL oxidation results in an increase in protein carbonyl contents, a recognized biomarker of oxidative stress. Carbonyl content was found to be highest in T2DM+PD-LDL indicating maximum protein oxidation. Maximum tail length in T2DM+PD-LDL as compared to diabetes, periodontitis and healthy individuals, indicate that the cellular toxic effect of glycoxidated LDL depends on the severity of the disease. Conclusion: High recognition of experimentally induced anti-MGO-LDL antibodies by T2DM+PD-LDL, T2DM-LDL and PD-LDL compared to NHS-LDL confirmed that the observed structural damage in T2DM+PD-LDL, T2DM-LDL and PD-LDL is due to glycoxidation, and thus MGO-LDL may be considered as a potential antigenic candidate for auto-immune response in diabetes and periodontitis patients with a potential for biomarker development.

Keywords: Type 2 diabetes, Periodontitis, Glycation, Inflammation, Reactive Oxygen Species

Circulatory TXNIP and Its Association with Disease Severity and Surrogate Markers of Insulin Resistance in Diabetic Nephropathy

Kuppuswami Jayashree[1], GP Senthilkumar[1], Sreejith Parameswaran[2], M Vadivelan[3]

[1]Department of Biochemistry, [2]Department of Nephrology, [3]Department of Medicine
Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER),
Puducherry, India, Pin-605008.
Contact: biosenthilkumar@gmail.com

OBJECTIVE: The mechanistic interplay of Thioredoxin-Interacting Protein (TXNIP), in response to high-glucose micro-environment, causing insulin resistance and renal cell organelle damage, through inflammatory and oxidative damage pathways has been recently determined in experimental renal disease models. Our objective was to observe the association of circulating TXNIP level with indices of insulin resistance and kidney damage, to translate its experimentally established role in nephropathy to human system. METHODOLOGY: Type 2 diabetes patients with Diabetic Nephropathy were recruited and categorized into three groups, namely, G3, G4, and G5 groups (N= 20 each), based on MDRD-eGFR equation. Biochemical parameters in blood and urine, Urinary Microalbumin, and Plasma TXNIP were quantified. TyG index, Triglyceride-to-HDL-C index were calculated using established formulae in literature. RESULTS: Plasma TXNIP level was significantly increased in G5 group, with the lowest level observed in G3 group. It positively correlated with TyG index, Triglyceride-to-HDL-C index and, urinary Microalbumin. There was a significant increase in TXNIP, and TyG index with increase in disease severity. TXNIP did not show association with serum glucose, urinary Protein-to-creatinine ratio, and disease duration. CONCLUSION: TXNIP may have a mechanistic relationship with the alteration in the markers of insulin resistance and disease severity. It increases with progression of disease, and is implicated in peripheral glucose intolerance. TXNIP could link the onset of insulin resistance and tissue damage in diabetic nephropathy. The association of TXNIP with urinary microalbumin levels could be suggestive of its role in tissue damage, leading to low renal filtration function, and must be further evaluated.

Keywords: Diabetic Nephropathy, Insulin Resistance, TXNIP, Chronic kidney disease

Association between the Extents of Methylation in Subjects with Coronary Artery Disease (CAD) By Pyrosequencing

Shyamashree Banerjee[1], Minal U. Paradkar[1,2], Chandrashekhar K. Ponde[3], Rajesh M. Rajani[3], Sudhir Pillai[3], Tester F. Ashavaid[1,2]

[1]Research Laboratories, [2]Biochemistry, [3]Cardiology
PD Hinduja Hospital, Mumbai
dr_tashavaid@hindujahospital.com

OBJECTIVES: DNA methylation, one of the most stable forms of epigenetic modification is associated with the development and progression of CAD. Top 5 significant CpGs from Discovery phase by microarray were analysed by the gold standard, Pyrosequencing(PSQ). We aimed to standardise and associate the methylation% in an independent CAD cohort. METHODOLOGY: Blood samples of 50-age matched angiographically CAD positive male cases with 50 angiographically CAD negative male controls were subjected to lipid profile estimation and PSQ for methylation level analysis. Findings and subgroup analysis were evaluated by MannWhitney U; Kruskal-Wallis' rank test and two way ANOVA by MedCalc(v19.6). RESULTS: The methylation levels in HLA-DQA1 for cg10217052-78.5(37-85) and 76.5(24-84) and cg09411910-81(72.0 to 93.0) and 81.5(50.0 to 89.0) in cases and controls respectively. In HLA-DQB1-cg03344051, levels in cases were 28.88+9.41 and 30.36+9.37 in controls. For HLA-DRB1-cg07889003, in cases and controls-15.5(5.00-39.00) and 10.5(5.00-29.0); while in cg08269402-52(16-65) and 42.5(17-61) was seen respectively. No association was observed between methylation levels and their respective lipid profile. Significant difference was obtained in methylation% in double or triple vessel disease(DVD or TVD) as compared to single vessel disease(SVD) in 3 sites-cg03344051,cg07889003 and cg08269402. This suggests an increase in the extent of methylation with the increase in CAD severity. CONCLUSION: PSQ was standardised for analysis of methylation levels for 5 CpG sites. There was a marked increase in the extent of methylation in 3 CpG sites in DVD/TVD cases as compared to SVD cases. A novel site, cg07889003 identified in our Discovery phase has shown association with the severity of CAD.

Keywords: Epigenetics, CAD, Methylation, Pyrosequencing, HLA

Screening of Potential Inhibitors of Pseudoesterase Activity of Albumin: A Step towards Understanding Its Role in Cholesterol Modulation

Sheemona Chowdhary*, Deepak Kumar, Sumanpreet Kaur, Rajasri Bhattacharyya, Dibyajyoti Banerjee

Department of Experimental Medicine and Biotechnology, Post Graduate Institute of Medical Education and Research, Chandigarh, India
Email: sheemona86@gmail.com

Albumin is known to possess pseudoesterase activity. It has shown a slow turnover with different ester substrates. However, its physiological function is still unknown. Our laboratory has recently hypothesized that the pseudoesterase activity of albumin plays a role in the modulation of cholesterol synthesis (PMID 29685194). Therefore, if pseudoesterase activity is inhibited, cholesterol synthesis is expected to increase. To date, there is no complete understanding of the inhibitor profile of pseudoesterase activity of albumin and its implication in disease. Based on such findings, we believe that the inhibition of pseudoesterase activity of albumin should be investigated. Objective: To screen diverse compounds for understanding inhibition of pseudoesterase activity of albumin. Methodology: *In silico* and *in vitro* experiments were performed to understand the pseudoesterase activity inhibition characteristics of the compounds. We studied the mechanism of interaction of such compounds with albumin. Results and Conclusion: We observed that different types of compounds showed potent inhibition of pseudoesterase activity of albumin, and detailed studies are required for understanding the role of such inhibition in controlling *de novo* cholesterol biosynthesis.

Keywords: Pseudoesterase activity, cholesterol synthesis, inhibitors

An Inquiry into the Role of Protein Cornichon Homlog1 Protein (CNIH) in Solid Tumour Microenvironment

Jonita Chongtham, Tapasya Srivastava

Department of Genetics, University of Delhi South Campus, New Delhi
Email id: jonichongtham@gmail.com

Objective: Tumour hypoxia defined as a decrease in the tissue oxygen levels in solid tumours represents a fundamental pathophysiological condition in solid tumour microenvironment. It is known to be associated with radio/chemo resistance and metastasis that eventually leads to cancer progression and also contributes to poor prognosis in cancer patients. Protein Cornichon homolog1 (CNIH) is a receptor cargo protein whose expression is affected by the hypoxia niche. CNIH mediates the TGFα signalling and Notch signalling by sequestering the EGF containing premature forms of the protein in the endoplasmic reticulum of cells thereby hindering their downstream signalling. We try to elucidate the plausible effect of CNIH in driving tumorigenesis in solid tumour in our study. Methodology: The expression of CNIH in tumour hypoxia was studied in gastric adenocarcinoma cell line AGS. We have tried to explore its effects using molecular biology techniques, whole transcriptomic approach, in vivo model system and 3D culture. Results and conclusion: Gastric cancer is the fourth highest cause of cancer deaths worldwide which is further exaggerated by hypoxia. CNIH affects important signalling pathways like TGFα and Notch signalling affecting cell proliferation, EMT and stemness. We also found that increased expression of CNIH leads to better response to Cisplatin even in hypoxia. This study sheds light into previously unexplored signalling cascade involving CNIH in gastric cancer and opens up an avenue for CNIH as diagnostic or therapeutic target.

Keywords: Tumour microenvironment, hypoxia, gastric cancer, CNIH, TGFα, Notch

MGIMS Award Category

Molecular characterization and identification of dengue virus in febrile patients referring at AIIMS Bhopal hospital in central India

Ashish Kumar Yadav[1*], Arshi Siddiqui[1], Roji Begum[1], Ashok Kumar[1], Debasis Biswas[2], Jagat R Kanwar[1] and Rashmi Chowdhary[1$]

[1]Department of Biochemistry, [1] presenting author, [1$] co-responding author, [2] Department of Microbiology, All India Institute of Medical Sciences (AIIMS), Saket Nagar, Bhopal, Madhya Pradesh, 462020, India.*

Corresponding author: rashmi.biochemistry@aiimsbhopal.edu.in

Objective: Dengue virus (DENV) is mosquito-borne Flaviviruses having four antigenically distinct serotypes, DENV 1-4. The state of Madhya Pradesh (MP) in India adjoined with dengue susceptible states; wherein Bhopal city with many natural and man-made freshwater lakes and gardens have observed a marked increase in the number of dengue infection the past few years. Epidemiological studies have revealed that the role of each serotype is different in the severity of the disease. Studies are indicating the circulation of all DENV serotypes has been reported in MP. Although limited information is available on serotypes /genotypes responsible for outbreaks from Bhopal city. There is an urgent need to find out the pattern and dynamics of DENV within outbreak situations in this area.

Method: We investigated febrile illness in patients reporting at AIIMS Bhopal, from June 2019 to March 2021. Molecular and serological tests were conducted on collected 156 serum samples. Dengue-specific amplicons were sequenced and phylogenetic analysis was performed.

Results: 52.3% of cases were positive for dengue infection, 4% for Chikungunya infection, and 4.46% were having co-infection with both DENV and Chikungunya. Dengue virus serotype 1 and 2 were confirmed by Real-Time Polymerase Chain Reaction (qRT-PCR) as the etiology in dengue infection. DENV RT-PCR positive samples were subjected for genomic sequencing have shown new genotypes in circulation.

Conclusion: The study done on febrile patients at AIIMS Bhopal has a high incidence of dengue infection. Co-infections with Chikungunya were observed. Identification of circulating serotypes/ genotypes will help in the molecular epidemiology of DENV in the region.

Keywords: Dengue Virus (DENV), Epidemiology, Genotyping, Serotyping, Central India.

O-1

Machine Learning Predictive Models of LDL-C in the Population of Eastern India and Its Comparison with Directly Measured and Calculated LDL-C

Anudeep P P, Suchitra Kumari,
Aishvarya Shri Rajasimman,
Saurav Nayak, Pooja Priyadarshini

All India Institute of Medical Sciences Bhubaneswar, Patrapada, Odisha, India, PIN- 751019

Background: LDL-C is a strong risk factor for cardiovascular disorders. The formulas used to calculate LDL-C showed varying performance in different populations. Machine learning models can study complex interactions between the variables and can be used to predict outcomes more accurately. Objectives: The current study evaluated the predictive performance of three machine learning models- Random forests, XGBoost and Support Vector Regression (SVR) to predict LDL-C from total cholesterol, triglyceride, HDL-C in comparison to linear regression models and some existing formulas for LDL-C calculation, in eastern Indian population. Methodology: The lipid profiles performed in the clinical biochemistry laboratory of AIIMS Bhubaneswar during 2019-2021, a total of 13391 samples were included in the study. Laboratory results were collected from the laboratory database. 70% of data classified as train set and used to develop the three machine learning models and linear regression formula. These models were tested in the rest 30% of the data (test set) for validation. Performance of models evaluated in comparison to best six existing LDL-C calculating formulas. Results: LDL-C predicted by XGBoost and random forests models showed a strong correlation with directly estimated LDL-C (r = 0.98). Two machine learning models performed superior to the six existing and commonly used LDL-C calculating formulas like Friedewald in the study population. When compared in different triglycerides strata also, these two models outperformed the other methods used. Conclusion: Machine learning models like XGBoost and random forests can be used to predict LDL-C with more accuracy comparing to conventional linear regression LDL-C formulas.

Keywords: LDL, Friedewald Formula, Machine Learning, Martin Formula

O-2

Molecular Modelling and Docking Analysis of SARS-CoV-2 Helicase (YP_009725308) as Drug Target

Rajneesh Prajapat, Suman Jain

Department of Biochemistry, Pacific Institute of Medical Sciences, Sai Tirupati University, Udaipur, Rajasthan, INDIA
**Corresponding author e-mail: rajneesh030041@gmail.com*

Introduction: The ongoing outbreak of COVID-19 has become a global health emergency. The SARS-CoV-2 helicase (nsp13) play an important role in SARS-CoV-2 replication and could be serve as a target for antivirals to develop potential COVID-19 treatment. Objective: Homology modelling and docking analysis of SARS-CoV-2 helicase (YP_009725308) as drug target. Methodology: The structure and function of SARS-CoV-2 helicase (YP_009725308) predicted by in silico modelling studies. The SWISS-MODEL Structure Assessment tool was used for homology modelling and visual analysis of crystal structure of protein. The validation for structure models was performed by using PROCHECK. Model quality estimates based on the QMEAN and ProSA. The MCULE-1-Click docking, and InterEvDock-2.0 server were used for protein–ligand docking. Results: The SARS-CoV-2 helicase (YP_009725308) model corresponding to probability conformation with 90.9% residue of core section that specifies accuracy of predicted model. The ProSA Z-score score -9.17; indicates the good quality of the model. Inhibitor N-[3-(carbamoylamino) phenyl] acetamide exhibited effective binding affinity against helicase (YP_009725308). Docking studies revealed that Lys-146, Leu-147, Ile-151, Tyr-185, Lys-195, Tyr-224, Val-226, Leu-227, Ser-229 are important residues for receptor-ligand interaction. Conclusion: Hence, the proposed inhibitor could potently inhibit SARS-CoV-2 helicase (YP_009725308) that recognized to play key roles during replication of viral RNAs. Overall findings demonstrate the SARS-CoV-2 helicase (nsp13) serve as a target for antivirals to cure COVID-19.

O-3

An Investigation into the *in Vitro* Anticancer, Antimicrobial and Antioxidant Effects of Ethanolic Seed Extract of *Cichorium Intybus* L.

Anu Chandra* Mohd Amir Khan,
Ishrat Hussain and Rumana Ahmad

Dept. of Biochemistry, Era's Lucknow Medical College & Hospital, Sarfarazganj, Era University, Hardoi Road, Lucknow-226003, UP, India

Background: Breast cancer (BC) is a global health problem and is expected to affect 19.3 million women by 2025. Herbal medicine is one of the most commonly used complementary therapies adopted by patients suffering from cancer. The main objective of the present study was to evaluate the anticancer activity of C. intybus crude seed extract against breast cancer cell line MDA-MB-231. The seed extract was also explored for its antimicrobial and antioxidant activity. Materials and Methods: Cytotoxic effect of CI ethanolic seed extract against MDA-MB-231 cells was determined using Trypan blue dye exclusion method and MTT assay in the dose range 10-1500 µg/mL. Antibacterial activity was determined using disc diffusion method against Staphylococcus aureus and Escherichia coli in the range 10-500 mg/ml. Antioxidant activity of seed extract was determined using DPPH method. Results: Ethanolic extract of CI seed extract was found to possess no significant cytotoxic effect against MDA cells in the tested range which suggests further evaluation of its anticancer activity at concentrations >1500 µg/mL. Ethanolic extract of CI seeds was found to possess significant antibacterial activity against S. aureus at 60-150 mg/ml while no appreciable activity was detected against E. coli upto 500 mg/ml. The seed extract also displayed significant antioxidant activity of 87.74% at 100 µg/mL. Conclusion: Ethanolic seed extract of CI might prove to be potentially beneficial in treating breast cancer if studied at higher doses against breast cancer cell lines as well as in animal models in future studies for developing integrative cancer therapy against proliferation, metastasis and migration of breast cancer cells.

Keywords: cancer, Cichorium, *in vitro*, herbs

O-4

Utility of Neutrophil Gelatinase-Associated Lipocalin/Matrix Metallopeptidase-9 Complex as a Novel Biomarker to Diagnose Epithelial Ovarian Cancer

Rohit Kumar Gupta[1], Sagar Dholariya[2],
Ragini D. Singh[2], Deepak Parchwani[2]

Department of Biochemistry,
[1]G. S. Medical College, Pilkhuwa.
[2]All India Institute of Medical Sciences, Rajkot
Email: drsagar.dholariya@gmail.com

Background: Epithelial ovarian cancer (EOC) is the deadliest gynecological malignancy due to its invasiveness and metastatic characteristics. Neutrophil gelatinase-associated lipocalin/Matrix metallopeptidase-9 (NGAL/MMP-9) complex causes extracellular matrix degradation, which plays a crucial role in the initiation and progression of ovarian carcinogenesis. Objectives: (1) To measure serum NGAL/MMP-9 complex in EOC, benign ovarian conditions, and healthy controls; (2) To determine the cut-off value of NGAL/MMP-9 complex for diagnosis of EOC. Materials and Methods: This hospital-based cross-sectional study included a total of 50 EOC cases, 50 benign ovarian cases, and 50 apparently healthy controls. Serum NGAL/MMP-9 complex was measured by a commercially available ELISA kit (sandwich ELISA). Significant differences in mean and median in different groups were calculated by using ANOVA and Kruskal Wallis tests, respectively. ROC curves were plotted to determine the cut-off, sensitivity and specificity of Serum NGAL/MMP-9 complex for diagnosing EOC. Results: The median values of NGAL/MMP-9 complex in healthy controls, benign ovarian tumors and EOC were 29.2 ng/ml, 53.7 ng/ml and 67.5 ng/ml, respectively. The difference in the median was statistically significant ($p < 0.01$). The serum level of NGAL/MMP-9 complex was significantly higher in stage III and IV compared to stage I and II (42.9 ng/ml vs. 70.5 ng/ml, $p < 0.003$). The NGAL/MMP-9 complex has 82% sensitivity and 79% specificity for diagnosing EOC at a cut-off value of 55.0 ng/ml. Conclusion: The NGAL/MMP-9 complex may be a promising biomarker for the diagnosis and progression of EOC.

Keywords: Epithelial ovarian cancer, biomarker, diagnosis,

O-5

Molecular Association of Asymmetric Dimethyl Arginine and Mitochondrial DNA Dysregulation in Gastric Cancer

[1]Priyatma, [1]S. Prakash, [2]G. Makharia,
[3]P. Sahni, [4]R. Sahoo, [5]S. Thulkar,
[6]R.M. Pandey, [1]A. K. Mukhopadhyay

[1]Department of Laboratory Medicine,
[2]Gastroenterology, [3]GI Surgery,
[4]Medical Oncology BRA IRCH, [5]Radiology BRA IRCH,
[6]Biostatistics
All India Institute of Medical Sciences, New Delhi
Email: prakashaiims@gmail.com
priyatma08@gmail.com

Study was planned to see the molecular association of ADMA and mtDNA copy numbers in patients with GC. 22 naive gastric cancer patients, 20 disease control (DC) and 20 healthy subjects (HC) were recruited from the OPD of the Gastroenterology. Subjects without any other major illness age from 18-65 years were included in the study. Blood samples were collected and molecular and biochemical measurement of eNOS mRNA, iNOS mRNA, mtDNA, ADMA/SDMA (by HPLC), superoxide dismutase (SOD), nitric oxide (NO), ionized calcium levels were done respectively in all the groups. More than fourfold of eNOS mRNA was found up regulated in GC while iNOS mRNA expression was non-significant as compared with DC and HC. Nitric oxide levels were increased while ADMA levels were significantly decreased in GC. Compared with the control group, the levels of ADMA, SOD and Ionized Calcium levels were significantly decreased in GC patient in respect to DC and HC ($p < 0.05$). The significant difference ($p<0.05$) in ADMA and SDMA concentration in GC patients, suggest that dimethyl arginine dimethylamino hydrolase (DDAH) dysregulates ADMA levels in GC patients and subsequently releases the higher concentration of NO which may be blocking the ionized calcium levels and directly involved by dysregulation of mtDNA copy number in GC. There was no significant correlation ($p<0.16$) between disease control and healthy control for SDMA levels. Thus, mtDNA copy numbers and ADMA levels could be potential biomarker for early detection of GC and may be future diagnostic and prognostic value for assessment of GC patients.

Keywords: Gastric cancer, mitochondrial DNA, ADMA

O-6

Nanocurcumin in Oral Squamous Cancer Cells and Its Efficacy as a Chemo-Adjuvant

Prakruti Dash, Diptasree Mukherjee,

Department of Biochemistry, All India Institute of Medical Sciences, Bhubaneswar, Odisha
Email Id: dashdrprakruti@gmail.com
biochem_prakruti@aiimsbhubaneswar.edu.in

Objectives: To evaluate the additive effect of Nanocurcumin on the cytotoxic effects of Cetuximab in oral squamous carcinoma cells (OSCC) in vitro. Methodology: Human oral squamous cell cancer cell lines (KB cells) were commercially purchased and cultured following cell culture protocols and were passaged till they reached 80% confluence. MTT assay was performed to check the cell proliferation by seeding the KB cells into 96 -well plates at $5x10^3$ cells/ well and treating with serial doses of Nanocurcumin (NC) for 24hours and 48 hours respectively. Cultured cells were also treated with Cetuximab alone and MTT assay was done to check the cell proliferation. IC_{50} values for both the agents were calculated using non-linear regression on the log dose using software GraphPad Prism 8.4.2 Cytotoxic potential of combined treatment with Nanocurcumin and Cetuximab was then studied on the proliferation of KB cells by MTT assay. Results: IC_{50} value of Cetuximab on KB cell lines was calculated to be 330.1 µgm/ml and IC_{50} value of Nanocurcumin on the cell lines was 15 µM. Significant cytotoxic effect was observed with combination treatment of Nanocurcumin and Cetuximab against single treatment with Nanocurcumin and Cetuximab. Conclusion: Higher cytotoxic effect was observed with Nanocurcumin on KB cell lines compared to Cetuximab. Combination of both the drugs had more significant cytotoxic effect compared to single drug treatment. Nanocurcumin shows good potential as a chemo adjuvant in Oral cancer cells in the *in-vitro* study.

Keywords: Nanocurcumin,Oral squamous cell carcinoma,

O-7

Association Urinary Podocalyxin Levels with Urinary Microalbuminuria for Early Detectionof Nephropathy in Patients with Type 2 Diabetes Mellitus

Veluri Ganesh, Murugan M

Basaveshwara Medical College and Research Centre, Chitradurga, Karnataka.
Email ID: ganeshbabu370@gmail.com

Objectives: Recent Research showed Podocalyxin (PCX) is apodocytes membrane protein and the major negatively charged protein in the glomeruli. PCX is the main component of the charge barrier of the glomerular basement membrane (GBM) andplays a critical role in regulating the permeability of the glomerular filtration barrier. The present study was carried out to investigate the association of Urinary Podocalyxin with Microalbuminuria for earlydetection of diabetic nephropathy in patients with type 2 diabetes mellitus. Methodology: A total 60 T2DM Patients subdivided into two groups (30 T2DM with Normoalbuminuria and 30 Microalbuminuria) based on urinary albumin levels and 30 healthy individuals were included into the study. Biochemical parameters such as FBS, PPBS, RFT and HbA1c was analysedby laboratory standard methods, Urinary Podocalyxin was analysed by ELISA, Urinary Albumin levels by immuno turbid metric method. Results: Statistically elevated levels of FBS, PPBS, Urea, Creatinine and HbA1c observed in two groups of T2DM patients when compared with controls. The Urinary Podocalyxin was statistically elevated levels found in patients with two groups of diabetes mellitus when compared to healthy individuals. The urinary PCX were positively correlated with Glycosylated hemoglobin levels and urinary Albuminuria. The urinary Podocalyxin elevated in patients with T2DM with Normoalbuminuria than Microalbuminuria. Conclusion: This study was suggested that to estimate Urinary Podocalyxin levels are better early clinical predictable marker for nephropathy in Type 2 Diabetes Mellitus than urinary Albuminuria.

Key words: Urinary Podocalyxin, HbA1c, ELISA and Type 2 Diabetes Mellitus

O-8

Evaluating Biological Activities of Curcumin combined with Doxorubicin against TNBC (MDA-MB-231) and its Computational Approaches against Cancer Proteins

Esha Sarkar[1], Aparna Misra[1],
Rumana Ahmad[1], Abbas Ali Mahdi[2]

[1]*Dept. of Biochemistry, Era's Lucknow Medical college and Hospital, Era University, India*
[2]*King George Madical College, KGMU, India*
Email ID- sarkar.esha3@gmail.com

Background: Breast cancer is considered the most prevalent cancer among women, affecting almost 2.1 million women annually and also causes the highest number of cancer-related deaths among women worldwide. Despite the evolution in chemotherapy, most of the drugs (Doxorubicin) still do not reach the tumor site at effective doses and often results in high systemic toxicity and poor pharmacokinetics. Therefore, the need for chemotherapeutic drugs to achieve efficacy at lower doses is the need. Curcumin is a phytocompound, found in Curcuma longa is widely used for its antioxidant and anti-inflammatory activities. The anticancer potential of curcumin has been found to induce apoptosis at the G2 phase of the cell cycle via a p53-dependent pathway in breast cancer cells. Objective: Present study focuses on the antioxidant and anticancer activity of Curcumin and its chemosensitizing effect in combination with Doxorubicin, leading to apoptosis in TNBC (MDAMB-231) with its computational approaches (in silico). Methodology: Antioxidant activity was analyzed by using DPPH, cell viability assay was performed by MTT analysis, oxidative stress by DCFDA staining, and identification of apoptosis by AO/EtBr staining process. Molecular docking studies were performed using Auto-Dock version 2 program. Results: Curcumin was found to have antioxidant activity as well as chemosensitizing potential against TNBC (MDA-MB-231). Conclusion: According to the study, curcumin can act as a powerful antioxidant and anticancer compound, found to have chemosensitizing activity of Doxorubicin at potentially low doses. Keywords: Curcumin-Doxorubicin, Curcumin, MDA-MB-231, Chemosensitizing-activity, Breast cancer cell-line

Keywords: Curcumin-Doxorubicin, Curcumin, MDA-MB-231, Chemosensitizing-activity, Breast cancer cell-line

O-9

Case-Control Study of Circulating MicroRNAs- A Diagnostic Predictor in Coronary Heart Disease Subjects

Thirunavukkarasu Jaishankar[1], Karini Keerthi[*], Kasthuri Natarajan[2], Shantha Kanamma[3]

[1]Department of Biochemistry, [2] Department of Translational Medicine, [3]Department of Medicine
SRM Medical College Hospital & Research Centre, SRMIST, Kattankulathur, Kancheepuram - 603 203, Tamil Nadu, India
**Department of Biochemistry, ESIC Medical College and PGIMSR, KK Nagar, Chennai-600 033, Tamil Nadu, India*

Coronary Heart Disease (CHD) is still a serious issue across the world. Novel and efficient biomarkers for early detection are required. MicroRNAs (mi-RNA) are small, non-coding RNAs that post-transcriptionally control gene expression by degrading and repressing mRNAs. The current case-control study was designed to assess the diagnostic mi-RNA-126, 122 level in angiographically proven CHD subjects. This cross-sectional study was done on participants attending the master health check-up and General Medicine OP at SRM Medical College Hospital and Research Center. Through quantitative real-time polymerase chain reaction (qRT-PCR) analysis, the circulating levels of mi-RNA 126 and mi-RNA 122 in serum from 75 young people aged 30-55 years with CHD and 75 normal healthy people without CHD were determined. Circulating mi-RNA 122 levels were probably higher, whereas mi-RNA-126 levels were significantly decreased in CHD subjects when compared to healthy controls. The levels of mi-RNA 122 and 126 in the blood did not correlate with demographic or clinical variables. The area under the curve (AUC) for circulating mi-RNA 122 and 126 was 0.674 and 0.600, respectively, with sensitivity and specificity of 65.17%, 55.43%, 67.39%, and 58.62%. The combination diagnostic effectiveness of mi-RNA 122 and 126 was shown to be more sensitive and specific. Circulating mi-RNA 122 and 126 might be new, noninvasive biomarkers for CHD early detection. Further elucidation of the function of mi-RNA 122, 126 in the evolution of CHD would contribute to a better knowledge of the disease process, perhaps leading to a novel diagnostic method.

Keywords: Coronary Heart Disease, mi-RNA, Real Time PCR, Cardiovascular disease

O-10

Normal Lipid Profile – Does It Mean Everything Normal?

Afshan Meraj, Noorjahan M,
K.S.S. Sai Baba, Vijaya Bhaskar M,
Siraj A Khan, Sreedevi NN

Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, Telangana, India.

AIM: To assess serum lipoprotein-a{Lp(a)} in individuals with normal lipid profile. MATERIALS AND METHODS: Lp(a) was analyzed in 60 (Males = 32 and Females=28)] apparently healthy subjects. The study group was divided into sub groups based on the cut offs for normal level in healthy individuals as per NCEP ATP-III guidelines i.e, Total Cholesterol < 200 mg/dl (Group1); TC 200-239mg/dl(G2); TC>240mg/dl (G3); Triglycerides <150mg/dl (G4), TG>150 mg/d l(G5). Chi square test was done to compare incidence of high Lp(a) in all groups. Comparison of Lp(a) levels in TC groups was done by ANOVA test and in TG groups by t-test. RESULTS: The subject's mean±SD of age was 45.9±15.6 years. High Lp(a)(>30mg/dl) was found in 8(40%) subjects in G1, 5(25%) in G2, 15(75%) in G3 with significant chi-square test (p=0.005), whereas in TG groups 11(36.6%) and 17(56.6%) subjects showed high Lp(a) but chi-square was not significant (p=0.1). Mean and p values of Lp(a)(mg/dl) in TC groups were (30.6, 31.3, 61; p<0.02) and TG groups were (31.4, 50.7; p=0.03). Lp(a) showed significant correlation with TC in normolipidemic G1 group (r=0.46; p<0.03), G3(r=0.5; p=0.01), and in TG G5(r=0.49; p=0.005). CONCLUSION: We found in our study Lp(a) is significantly elevated in normolipidemic group. Lp(a) is an independent predictor of cardiovascular events but is underutilized in detection of high risk individuals. Lp(a) adversely affects endothelial function, inflammation, oxidative stress, fibrinolysis and plaque stability, leading to accelerated atherothrombosis and premature CAD. Hence routine determination of serum Lp(a) can identify high risk individuals with deceptively normal lipid profile.

Keywords: Lipoprotein(a), CAD, Atherosclerosis, Total Cholesterol.

O-11

A Simple and Reliable Method for the Determination of Thiopurine Methyltransferase Activity in Whole Blood Sample Employing Liquid Chromatography Coupled With Tandem Mass Spectrometry

Shailesh[1], Krishnamurthy Bhat[2], Cannanore Ganesh Pai[1]

[1]*Department of Gastroenterology and Hepatology, Kasturba Medical College, Manipal Academy of Higher Education, Manipal (576104), India.*
[2]*Department of Pharmaceutical Quality Assurance, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal (576104), India.*
Email ID: shailesh0904@gmail.com

Objectives: Thiopurines are used in the treatment of various ailments such as inflammatory bowel disease (IBD), acute lymphoblastic leukemia, autoimmune diseases etc. The metabolism of thiopurine varies among individuals owing to the polymorphic enzyme thiopurine methyltransferase (TPMT). It is recommended to test the patient's TPMT status before prescribing thiopurine drugs to avoid life-threatening toxicity. Lately, TPMT phenotyping is performed using liquid chromatography combined with mass spectrometry compared to conventional HPLC-UV/ fluorometry techniques. We describe here an improvised two-step protein precipitation technique and a simple chromatographic method coupled with MS/MS. Methodology: TPMT activity was assessed by quantifying the 6-methyl mercaptopurine formed in human whole-blood lysate (WBL). 100 µL of WBL was incubated at 370 C (60 minutes) with 6-Mercaptopurine and S-adenosyl-L-methionine, the enzymatic reaction was terminated by heating at 1000 C (10 minutes). The protein precipitation step was carried out by adding 4 volumes of methanol containing internal standard. The analytes were separated using a RP-18 column under reverse-phase conditions in isocratic mode and was validated in accordance with FDA guidelines. Results: The method was validated over a linear range of 10-450ng/mL with a correlation coefficient $\geqslant$ 0.99 and acceptable values of accuracy and precision. The newly developed method's applicability was successfully evaluated using 7 healthy controls and 8 IBD patients. The calculated TPMT activity using this method ranged from 29.95-59.99 nmol 6-MMP/g Hb/h. Conclusion: The application of this new simple and quick method for the measurement of TPMT in whole blood needs to be evaluated in larger studies and is likely to prove useful in predicting the life-threatening toxicity of thiopurine therapy.

Keywords: Personalized medicine, Inflammatory Bowel Disease, Thiopurine methyltransferase, Mass spectrometry

O-12

Pro-Oxidant and Antioxidant Role of Ceruloplasmin, Uric Acid and Their Correlation with Transferrin Saturation in Sickle Cell Anemia

Rina Wasnik[1], N. R Akarte[2]

Dept of Biochemistry
[1]Datta Meghe Medical College ,Wanadongri Hingna ,Nagpur
[2]JNMC, Sawangi Meghe Wardha (DMIMS DU)

Objectives: Pro-oxidant Ceruloplasmin, along with Transferrin plays an important in iron transport. Uric acid as plasma antioxidant promotes oxidative stress in cell environment. As Ceruloplasmin and Uric acid have pro and anti-oxidant role, this study is aimed to explore their predominant role in correlation with Transferrin saturation among the patients of sickle cell anemia. Material and Method: A comparative cross-sectional study was carried in Biochemistry Department, JNMC Wardha. Based on inclusion and exclusion criteria, 120 consenting study participants having Homozygous (SS) and Hetrozygous (AS) sickle cell anemia were compared with the healthy controls. Ceruloplasmin, Uric acid, Iron, TIBC, Transferrin saturation and hematological parameters were assessed. The descriptive and inferential statistical methods were applied as appropriate. Results: There was statistically significant reduction in the mean Hb (g/dl) levels among SS(7.40), AS(10.31), and control(14.81) and mean transferrin saturation % SS(17.68), AS(18.22) Control (36.44) levels. The significantly elevated mean Ceruloplasmin(mg/dl) levels for SS(42.43), AS(42.14), and control(27.11) and mean Uric Acid (mg/dl) levels of SS(6.24), AS(6.29), and control(4.23) were observed. Conclusion: Interpretation of iron status in correlation with Ceruloplasmin and Uric Acid remains a difficult task due to chronic inflammatory and haemolytic processes in sickle cell anemia. Mean transferrin saturation was lowered in Sickle cell diseases (SS). They have higher body iron stores due to increased red cell

turnover and blood transfusion.

Keywords: Ceruloplasmin, Transferrin saturation, Uric acid, Sickle cell anemia.

O-13

Assessment of Oxidative Stress Parameters in Metabolic Syndrome Patients with and Without Hypothyroidism

Barla Krishna, Priya K Dhas

Vinayaka Mission Research Foundation–VMRF-DU
Email:drkrishnabarla@gmail.com

Background: Oxidative stress (OS) is defined as an imbalance between the productions of prooxidant substances andantioxidant defenses. Oxidativestress is controlled by the endogenous antioxidant defense system (TAS), which includes antioxidant enzymes like Glutathione Peroxidase (GPx), catalase (CAT). Metabolic syndrome (MetS), also known as syndrome X or insulin resistance syndrome is characterized by the clustering of cardiovascular risk factors such as hypertension, insulin resistance, central obesity, and atherogenic dyslipidemia. In hypothyroidism, disturbance of oxidant/antioxidant balance leads to the production of reactive oxygen species (ROS) and leads to various cardiovascular complications. Objective:To determine the oxidative stress parameters–MDA, FRAP, Catalase, GPx in metabolic syndrome patients with and without hypothyroidism. Material and Methods: This study included 100 Subjects attending OPD of GVP MedicalCollege fromNorthcostalAndhra Region. The studyparticipants are classified into two groups. Group I – Metabolic Syndrome (50nos), Group II – Metabolic Syndrome with Hypothyroidism (50nos). Blood samples are collected and MDA, FRAP, GPx, Catalase were analysed. Results**:** A significant increase in Oxidative Stress was observed in Metabolic Syndrome patients with Hypothyroidism when compared to Metabolic Syndrome patients without hypothyroidism. Conclusion: The effect of excess thyroid hormones in cellular metabolism is complex, which is an added factor for the cardiovascular complications in metabolic syndrome patients. Hence the results of our study suggest earlier screening ofoxidativestressstatusinmetabolicsyndromewithhypothyroidism and antioxidant supplementation among the study population may prevent from complication of cardiovascular disease.

Key words: MDA, FRAP, GPx, Metabolic syndrome, Oxidative stress, Hypothyroidism

O-14

Digital and Futuristic Approaches for Covid-19 Monitoring In Pregnancy

Simmi Kharb[a], Abhyuday Singh[b]

[a]*Department of Biochemistry, and Multidisciplinary Research Unit, Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India*
[b]*Xformics Technologies, India*

Objective: Current scenario of COVID-19 pandemic paved way for evolution and implementation of futuristic digital and artificial intelligence technologies along with point-of-care technologies (POCTs) diagnostic technologies in the monitoring of pregnancy. Methodology: Researchers are developing ediagnostics POCTs to help the health workers in the monitoring of pregnancy and predicting complications during pregnancy for timely intervention. The future of diagnostic approaches towards COVID-19 and future pandemics require fast and cheap point-of-care technologies coupled to PCR/ ELISA/ CRISPR based diagnosis. Hence, proper diagnosis and testing are necessary to diagnose asymptomatic COVID-19 cases. Results: These advanced and alternative POCTs will prove highly beneficial, especially for the pregnant females, in detection of complications and associated comorbidities, like hypertension and preeclampsia, providing an opportunity towards risk assessment, diagnosis and prevention of diseases. Artificial intelligence in the current COVID-19 scenario could be of immense help in management, follow-up of pregnant women, and handling their clinical and epidemiological data, computational resources, scalability, privacy, and ethical concerns. Conclusion: The extent to which pregnancy imposes the risk of COVID-19 complications needs to be explored in detail and data mining in principle outcomes and preventive strategies on AI and digital and telemedicine platforms for eHealth and ediagnostics.

Keywords: COVID-19, pregnancy, preeclampsia, hypertension, diagnostics, biomarker

O-15

Association of MMP-9 Gene Expression & ET1 Levels in Late (Severe) Preeclampsia

Ravoori Saideswar Rao[1a], Manisha Singh[1b], Preethi Sharma[1a], Ritu Sharma[2b], Rakesh Gupta[b]

[1]Department of Biochemistry, [2]Department of Obstetrics and Gynecology,
[a]Santosh Medical College & Hospital, Ghaziabad.
[b]Government Institute of Medical Sciences, Greater Noida, UP.
Email ID: sai.ravoori7@gmail.com

Objectives: 1. To find out the fold change of Matrix metalloproteinases-9 (MMP-9) gene expression in whole blood by Polymerase Chain Reaction (RT-PCR) based techniques in Late (Severe) Preeclampsia (LPE) and control groups. 2. To quantify Human Endothelin –1(ET 1) by sandwich ELISA kit in LPE and control groups. Methodology: The study design was case-control, Case (⩾ 34 wks. of gestation) LPE (n40) with control Normal pregnant women (n 40). Study subjects were included from Department Obstetrics and Gynecology, GIMS, Greater Noida. Signed informed consent was obtained. The diagnosis of LPE is based on gestational age ⩾ 34 wks. with SBP 140 mmHg, DBP 90 mmHg at least two readings apart 4 hours, proteinuria. Subjects are not included in the study are those with a previous diagnosis of PE, family history of PE, Drug Abuse, Tobacco, alcohol consumption. Quantification of MMP 9 gene expression by RT PCR: RNA extraction by Trizol method (Geneziol, Genetix Biotech Asia Pvt. Ltd., India.), Synthesis of cDNA as per manufacturer (iScript cDNA Synthesis Kit, BIO-RAD, USA) with Thermal Cycler incubation conditions (Priming- 5 minutes at 250C, Reverse transcription- 20 min at 460C, Reverse transcription inactivation- 1 min at 950C) and RT PCR. Quantification of ET1 was done by Sandwich ELISA as per manufacturer protocol (puregene, Genetix Biotech Asia Pvt. Ltd., India). Statistical analysis was performed Mann -WhitneyU Test found significate Results: The levels of ET1 increased in LPE, Also MMP9 gene expression. Conclusions: The current study found a significant change in ET1 levels & MMP9 gene expression.

Keywords: Late Preeclampsia, Matrix metalloproteinases 9, Endothelin1,

O-16

Study of Vitamin-D Receptor Gene and Angiotensin II Receptor Gene Polymorphisms in Patients with Essential Hypertension

M. Prasad Naidu

Department of Biochemistry, Narayana Medical College and Hospital, Nellore, 524003, Andhra Pradesh, India.
Contact: +918801527888
Email: drmprasad@narayanamedicalcollege.com

Objectives: Essential hypertension is a complex, multifactorial and polygenic trait (Sandberg K, et al.). It is also called primary hypertension or idiopathic hypertension (Gold black hypertension). The study to investigate the Vitamin-D Receptor gene polymorphism and angiotensin II Receptor gene polymorphism in Essential hypertension subjects. Methodology: Collected 200 blood samples from EHTN subjects and 200 normal individuals as controls. All the outpatients in general medicine department with essential hypertension subjects were included in the study. RTPCR done by gene polymorphisms. Results: The present study ff genotype was found to be associated with 8.06 folds increased risk for Essential hypertensives compared to the FF genotype (OR 8.06, 95% CI 3.71–17.47, p =0.0001). Based on the dominant model, a combination of Ff+ff genotypes was observed with no association with high risk for essential hypertensives (OR 1.01, 95% CI 0.71–1.62, p = 0.75). AT1 allele frequency For A genotype, the number of males was 153, the number of females was 197. For the C genotype, the number of males was 15, and the number of females was 35. Conclusion: The VDR genetic variants were found to have an association with the severity of clinical features of EHTN Our data suggest that VDR gene Fok I polymorphism is related to the danger of developing EHTN. Ang II is a potent vasoconstrictor that exerts most known cellular actions through the Ang II type 1 receptor. However, more studies with increased numbers of EHTN patients are required to validate this research.

Keywords: EHTN, VDR, ATN gene polymorphism,

O-17

Apo B100/Apo A1 as Cardiovascular Risk Marker in Epileptic Children on Valproate, Oxcarbazepine and Levetiracetam Monotherapy

Anjali Dhama, Seema Lekhwani,
*J.S. Kaushik, *N.D. Vaswani

*Department of Biochemistry, *Department of Pediatrics,*
Pt. B. D. S. Post-Graduate Institute of Medical Sciences, Rohtak. E-mail ID: gurukulamanjali@gmail.com

Objectives: To evaluate the effects of valproate, oxcarbazepine and levetiracetam on Apo B100 and Apo A1 in children with epilepsy (CWE) on long term monotherapy. Methodology: 45 children (divided into three groups of 15 each) of age group 5-15 yrs were enrolled and Apo B100 and A1 levels were estimated using ELISA kits at initiation of monotherapy and six months after treatment. Results: All the three groups observed an increase in Apo B100/Apo A1 ratio after six months of respective monotherapy – valproate group [0.94±0.89, 1.10±1.10 ($p>0.05$)], oxcarbazepine group [0.92±0.63, 1.76±1.11 ($p<0.05$)] and levetiracetam group [1.24±0.87, 1.96±1.71 ($p>0.05$)]. Conclusion: Six months of monotherapy with oxcarbazepine resulted in an increase in Apo B100/Apo A1 ratio indicative of increased atherogenic potential.

Keywords: Apo B100/Apo A1 ratio, Valproate, Oxcarbazepine, Levetiracetam, CWE

O-18

Plasma Homocysteine: Is it a biosignature for impending Type 2 Diabetes Mellitus?

Priyanka Das, M. Noorjahan,
N.N. Sreedevi, Siraj Ahmed Khan,
M. Vijaya Bhaskar, K.S.S. Sai Baba

Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, Telangana, India.

Objective: To evaluate plasma Homocysteine levels in Type 2 Diabetes Mellitus and correlate with HbA1c and Fasting Plasma Glucose. Materials & Methods: In this observational, cross-sectional, single-centre study, 70 adult patients with type 2 DM and 30 healthy controls were selected from the Endocrinology outpatient department in Nizam's Institute of Medical Sciences, Hyderabad from July to August 2021. Plasma HCY, HbA1c and FPG in these patients were analysed. Social Science Statistics calculator (version 2021) was used for Mann-Whitney U Test & Spearman Rho Correlation. Results: The median plasma Homocysteine levels (µmol/L) among diabetics 15.54(11.24-19.47) were significantly higher than in non-diabetics 11.44 (9.54-13.34, $p=0.00001$). A significant positive correlation of Homocysteine was observed with HbA1c ($r=0.343$, $p=0.0004$) and Fasting Plasma Glucose ($r=0.287$, $p=0.003$). Conclusion: The present study revealed significantly elevated HCY levels in Type 2 DM as compared to controls. Hyper-homocysteinemia is attributed to causing damage to pancreatic beta cells leading to dysfunctional insulin secretion and insulin resistance. Also, HCY promotes vascular endothelial injury through oxidative stress resulting in chronic vascular complications of diabetes. The positive correlation observed between the levels of HCY, HbA1c and FPG warrants a need to monitor HCY levels in those at risk of overt diabetes and for achieving euglycemia and stalling micro and macrovascular complications in diabetics. Additionally, HCY is being explored frequently as a risk marker for coronary heart disease. Hence, periodic monitoring and controlling plasma HCY levels may slow down progression to overt diabetes and impede disease progression in those already affected.

Keywords: homocysteine, diabetes, HbA1c, fasting plasma glucose

O-19

Development of Chemiluminescence Based Bio-Chip Assay for Detection of Multi-Drug Resistance Tuberculosis on Polycarbonate Track-Etched Membranes

Bharti Jain and Savita Kulkarni

Radiation Medicine Centre, Bhabha Atomic Research Centre, Mumbai, India.
bharti.jain09@gmail.com

Objective: With the widespread use of rifampicin (RMP) and isoniazid (INH) and especially noncompliance, Mycobacterium Tuberculosis (M.Tb) resistance has become a growing problem. We have developed a new polycarbonate track-etched membranes (PC-TEM) based low density DNA

microarray designed for rapid detection of mutations conferring multi-drug resistance (MDR) in M.Tb culture isolates. Methodology: DNA chips were produced on PC-TEMs as a novel support. Enhanced chemiluminescence was used for signal detection. A DNA-chip was designed to include 14 specific probes for detecting mutations in 80bp rpoB hotspot region, katG gene and mabA-inhA regulatory region. RMP-resistance associated gene mutation points rpoB 516, 526, 531 and 533, INH-resistance associated gene mutation points katG315 and inhA-15 were targeted. A total of 50 culture isolates which were sensitive or harbouring different mutations was analysed. The results of culture-based DST were used as the gold standard and gene sequencing was performed to resolve the discordance. Results: Amongst 50 culture isolates, we have detected 18 MDR, 9 RMP monoresistant, 4 INH monoresistant and 19 fully susceptible isolates. The bio-chip test correctly detected 94.4% of mutations for which there was a sequence-specific probe on the microarray and 100% of 19 wild-type sequences. The identification of mutations using DNA-chip was 100% concordant with the sequencing data. Conclusion: The detection of point mutations in rpoB and katG genes by a DNA bio-chip can be used as a rapid, accurate and economical clinical detection method for MDR in M.Tb. This is very valuable for the control of tuberculosis epidemics.

Keywords: DNA bio-chip, tuberculosis, multi-drug resistance

O-20

A Study of Interaction of Various Dyes with Human Serum Albumin and Globulins

Monu Kumari*, Deepak Kumar,
Rajasri Bhattacharyya,
Dibyajyoti Banerjee**

Department of Experimental Medicine and Biotechnology, PGIMER, Chandigarh, India 160012
**presenting author: monabhardwaj2196@gmil.com*
***corresponding author: dibyajyoti5200@yahoo.co.in*

Dye-based methods are not popular for microalbuminuria detection.

Objective: To study the interaction of various albumin binding dyes with Human serum albumin and globulins. Methods: In silico and in-vitro studies are employed to find out the dye that binds more to HSA and least to globulins. Result: It is observed that all the dyes interact with albumin and globulins, and there is no absolutely albumin specific dye. This is true for bromocresol green and bromocresol purple, commonly used in clinical biochemistry laboratories for estimating albumin. Conclusion: Specific albumin binding dye development is the need of an hour so that dye-based albumin detection in urine is possible in the microalbuminuric range.

Keywords: microalbuminuria, dyes, human serum albumin

O-21

Assessment of Lipid Peroxidation and Antioxidant Status in Breast Cancer Patients during Chemotherapy

S.P.Tejaswi Pullakanam, M Murugan,
Rama Krishna N, B.V.Madhavi, B.RaviShankar

Vinayaka Mission Research Foundation-VMRF-DU, AVMC,Omega Hospital, GVP Medical College and Hospital, VSKP
Email: tejaswibio22@gmail.com

Background: Breast carcinoma is one of the most common neoplasms in women and is a leading cause of cancer-related deaths worldwide. Oxidative stress (OS) plays an important role in carcinogenesis. Assessment of Oxidative stress and antioxidant status in patients with breast cancer and to investigate the extent of the some parameters in the blood of breast cancer patients before and after treatment can be most contributive. Objective: To determine the effect of breast cancer on Oxidative stress, and antioxidant status, liver and renal function tests, at the same time, the role of doxorubicin (adriamycin), Cyclophosphamide and Paclitaxel (AC-T) in changing the measured markers before and after therapy. Methods: This study included 60 women with newly diagnosed breast cancer who underwent chemotherapy with AC as the therapy-first strategy after surgery and after therapy. Blood samples are collected from the patients and analysed to determine levels of - malondialdehyde (lipid peroxidation marker), total antioxidantstatus (TAS), Superoxide dismutase (SOD), Catalase (CAT) Liver-enzymes (alanine-amino transferase, aspartate amino transferase) blood urea, serum creatinine. Results: A concurrent significant increase in MDA and a significant decrease in TAS are

noticed. The levels of aspartate aminotransferase, alanine aminotransferase, blood Urea, Serum Creatinine was found to be more than normal range. Conclusion: Breast cancer is associated with enhancement of lipid peroxidation with associated decrease of antioxidant defense capacity. Elevated lipid peroxidation and oxidative stress are leading indices of breast cancer progression**.** Higher oxygen free radical production (ROS) and increased activities of antioxidant enzymes indicate a compensatory regulation of increased oxidative stress.

Key words: Oxidative stress, total antioxidantstatus, Superoxide dismutase, Catalase

O-22

Sodium Fluoride Vacutainers Are a Good Alternative to Conventional EDTA Vacutainers in Estimating Glycated Haemoglobin Levels

Arjun Asok, Varashree B.S

Department of Biochemistry, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India - 576104
email ID: arjun.asok21@learner.manipal.edu

OBJECTIVE: To compare the HbA1c values between the conventional EDTA vacutainers and sodium fluoride vacutainers using the ion-exchange chromatography method. METHODOLOGY: After obtaining the approval from Institutional Ethics Committee, fluoride vacutainers and EDTA vacutainers from the same patients were retrieved from the archive, where the HbA1c values were already obtained using a reference method (immunoturbidimetry). These were sorted into three groups of 50 sets each (Normal (A): <5.7%, Prediabetic (B): 5.7-6.4%, and Diabetes Mellitus (C) >6.4%). The sets were then processed simultaneously using Bio-Rad D-100. The pairs of values were then compared using regression analysis. RESULTS: The linear regression analysis for the groups A, B, and C gave an r-value of 0.99, 0.97, and 0.954 respectively, proving that the values among the different vacutainers are comparable to a high degree of confidence among all levels of glycaemic control. CONCLUSION: For estimation of HbA1c in a stand-alone laboratory, where the workflow is less, the fasting or postprandial blood glucose sample which is usually asked alongside is a reliable alternative to conventional EDTA samples. This may help in reducing the cost and increasing patient compliance in those settings. On the other hand, in a laboratory using a fully automated analyzer, it may increase turn-around-time (TAT).

Keywords: Glycated hemoglobin, high-performance chromatography, EDTA, sodium fluoride

O-23

Evaluation of Soluble AnnexinA1 as non-Invasive Biomarker for Early Diagnosis of Glomerular Injury in Diabetes Mellitus

Vijayetha Patil[1], Praveenkumar Shetty[2], Vidya S Patil[1], Anil Bargale[1]

[1]*Dept. Of Biochemistry, SDM College of Medical Sciences & Hospital, Shri Dharmasthala Manjunatheshwara University, Dharwad-580009, Karnataka.*
[2]*Nitte (Deemed to be University), Dept of Biochemistry, KS Hegde Medical Academy, Mangaluru- 575018, Karnataka*

Introduction: Currently the first indicator of diabetic nephropathy (DN) is microalbuminuria. Markers for earlier detection of diabetic kidney disease are needed. Since DN is associated with inflammatory pathology, urine excretion of an anti-inflammatory marker Annexin A1 which increases during the pathogenesis of disease could be used for early detection even before microalbuminuria sets in. Aim: To evaluate the diagnostic significance of Annexin A1 and correlation of different grades of albuminuria to excretion of Annexin A1 in Diabetics. Methods: A hospital based cross-sectional comparative study was conducted. Patients diagnosed with Type2 Diabetes Mellitus were divided into groups based on urine microabumin levels. Age and sex matched healthy controls were included. Serum glucose, urea, creatinine, lipid-profile, HemoglobinA1c, urine microalbumin were measured in fully automated analyser. Urine Annexin A1was estimated by Western blot technique. AnnexinA1 semiquantitation was done on renal tissue samples of DN cases by immunohistochemistry. Statistical analysis: The results presented as mean, standard-deviation and median, interquartile-ranges as appropriate. Comparison in between the groups was by ANOVA. Karl Pearson's correlation co-efficient 'r' was used for correlation. Results Annexin A1 was abundantly excreted in high quantities(++++) in patients with proteinuria, moderately (++)in patients with microalbuminuria, and

low(+) in patients with normoalbuminuria; absent(-) in the healthy controls. Formalin-fixed and paraffin-embedded renal sections showed strong staining for AnnexinA1 in DN and weak staining in normal control specimen. Conclusion: Annexin A1 was excreted in urine of diabetic patients even before they developed microalbuminuria. This could serve as a non invasive marker for early detection of Diabetic nephropathy.

Keywords: Annexin A1, Diabetic nephropathy, biomarkers for glomerular injury, Urine markers for nephropathy, albuminuria.

O-24

Urinary Microalbumin & HbA1c in Type 2 Diabetes Mellitus Patients in A Tertiary Care Hospital

Antarleena Bhattacharjee, P.K Ghosh,
P.S Pal, R.K Debbarma

Department of Biochemistry, Agartala Govt Medical College, Agartala, Tripura

Macrovascular & microvascular complication of Diabetes mellitus are a consequences of metabolic dearrangements. Diabetic nephropathy is one of the complications causes end stage renal disease. Hence the study aimed to evaluate correlation among level of urinary microalbumin, albumin creatinine ratio and HbA1c. Method: In this cross sectional study, done in AGMC, Considering the inclusion & exclusion criteria, the adult patients above 18 years of age diagnosed as Type II Diabetes Mellitus have been taken as cases. Estimation of urine microalbumin & creatinine is done in XL -640 autoanalyzer & HbA1c done by D-10 HPLC machine. ACR is documented after calculation. Result: In this study, it is observed that 69% microalbuminuria in relation to HbA1C. P value < 0.05 will be taken as significant. Conclusion: The above study reveals that ACR is significantly elevated in poor glycemic control patients. Urine microalbumin is the early biomarker to know status of renal involvement.

Keywords: Diabetes mellitus, Urinary microalbumin, HbA1c, Albumin Creatinine ratio.

O-25

Reliability of Albumin-Adjusted Calcium in Patients of Chronic Renal Failure in a Tertiary Care Center

Sarika Baku, Shubhra Jandial

Department of Biochemistry, Medical College Baroda & SSG Hospital, Vadodara, Gujarat.
E-mail: sarikabaku11@gmail.com

Calcium circulates in the blood in 3 forms. Approximately 50% circulates as ionized Ca+2.Most of the laboratories measure total calcium (TCa) and adjust it for albumin concentration if < 4 gm/dl to predict the true calcium status. However,this albumin-adjusted Ca(Adj-Ca)is less reliable predictor of true calcium in the patients of CRF. OBJECTIVES: The present study was planned to compare the results of TCa and Adj-Ca with ionized Ca+2in control & CRF patients and assess whetherAdj-Ca is a reliable indicator of true Ca in patients of CRF or not? METHODOLOGY: This study was carried out in SSG Hospital,Vadodara on patients attending medicine OPD having normal renal function(RFT) as controls &patients of CRF as cases.S.Creatinine,S.albumin,S.TCa was measured on fully auto-analyzer ERBA- XL-640 and S.Ionized Ca+2 by ISE analyzer and Adj-Ca was calculated by modified payne formula in both the groups.Adj-Ca[mg/dl] = TCa[mg/dl]+0.72[4-albumin{gm/dl}] Statistical analysis was done by pearson's coefficient correlation. RESULTS: This study was done in the month of September-2021 recruited 150 controls and 137 cases.It was observed that in control group(albumin 3.5+0.15gm/dl)Adj-Ca shows better correlation with ionized Ca+2(r=0.7944,p<0.0001) as compared to TCa (r=0.7671,p<0.0001, while in case group(albumin 2.3+0.35gm/dl)even Adj-Ca shows weak correlation (r=0.3417,p=<0.0001) with ionized Ca+2. CONCLUSION: This study concludes that Adj-Ca is a reliable indicator of true-Ca in patients having normal RFT. However in patients of CRF, Adj-Ca is overestimated thus not a reliable indicator to reflect the true calcium values. So, in these patients measurement of ionized Ca+2 by direct ISE method seems to be the only choice despite its cost.

Keywords: Albumin-Adjusted Calcium, Chronic Renal Failure, Ionized calcium, Total Calcium

O-26

Validation of AG-Q COVID-19 N-Antigen Self-Test in Comparison with Real Time RT-PCR

Ajaikumar Sukumaran, Arun Krishnan, Rhema Thomas, Jofy Paul, D M Vasudevan

Agappe Diagnostics Ltd., Agappe Hills, Pattimattom (PO), Ernakulam Dist, Kerala 683562

Validation of AG-Q COVID-19 N-Antigen Self-Test in comparison with Real Time RT-PCR Ajaikumar Sukumaran, Arun Krishnan, Rhema Thomas, Jofy Paul, D M Vasudevan Introduction Currently, RT-PCR and the rapid antigen test (RAT) are the major stakeholders in COVID-19 diagnosis. The RT-PCR is the gold standard testing method and RAT is considered for mass screening of COVID-19. In order to improve the accessibility and pace of diagnosis, ICMR had given permission for COVID-19 self-test by the public. AG-Q COVID-19 N-Antigen Self-Test kit is a home based rapid test kit developed by Agappe Diagnostics Limited. The kit has been validated at NIMS Medicity, Trivandrum and compared the performance with the RT-PCR Ct value. Aim Validation and comparison of AG-Q COVID-19 N-Antigen self-test with RT-PCR. Materials & Methods The AG-Q COVID-19 N-Antigen self-test is a lateral flow immunochromatography based rapid test. The Covipath COVID-19 RT-PCR kit from ThermoFisher Scientific was used for the comparison study. A total of 72 subjects were recruited (30 positive & 42 negative subjects) for the study with the Institutional Ethical Committee approval and informed consent from the subjects. To perform the comparison study, a nasal swab sample in lysis buffe for RAT and a nasopharyngeal swab sample in VTM for RT-PCR were collected from each participants. Result The AG-Q COVID-19 N-Antigen self-test offers 100% specificity with sensitivity of 83.33%. Conclusion As per the study result, the AG-Q COVID-19 N-Antigen self-test is satisfying the ICMR recommended specificity and sensitivity for rapid antigen self-test as compared with the RT-PCR.

Keywords: COVID-19, Rapid Antigen Test, RT-PCR, Sensitivity

O-27

Interaction of Fructose with Human Insulin Causes AGEs Formation and Changes in Its Secondary Structure: A Multi-Spectroscopic and Molecular Docking Study

Ali Raza[1], Asif Ali[1], Riaz Mahmood[2]

Department of Biochemistry,
[1]J.N. Medical college, [2]Faculty of Life Sciences,
Aligarh Muslim University, Aligarh, UP-202002, India.
Email address: aliraza.bc.amu@gmail.com

Objectives: The aim of this work was to analyze the changes in the secondary structure, morphology and dynamics of human insulin as a result of fructosylation using biophysical and molecular modelling techniques. Methodology: Human insulin (56 µM) was incubated with different concentrations of fructose (5, 10, 25 and 50 mM) at 37 °C for 10 days in 10 mM phosphate buffered saline, pH 7.4. Biophysical characterization of modified/fructosylated insulin was performed through spectroscopic studies such as UV-vis spectroscopy, intrinsic and AGEs (advanced glycation end products) specific fluorescence, CD spectroscopy, scanning electron microscopy (SEM), dynamic light scattering (DLS) while computational interaction study was done by molecular docking. Results: UV-VIS and fluorescence spectroscopic studies showed that fructose causes alterations in the intrinsic properties of insulin. Changes in the secondary structure of insulin were analyzed through CD spectroscopy. Insulin aggregation was observed and further confirmed through SEM and DLS. Molecular docking showed fructose as a potent binding partner for insulin. Conclusion: Studies like this can be used to confirm the extent to which glycation and formation of small protein aggregates take place, which are etiological factors in many pathological conditions.

Keywords: Fructosylation, Human Insulin, AGEs, Protein aggregation

O-28

Assessment of Vitamin D and Total Cholesterol/HDL Ratio in Patients with Uncontrolled Type 2 Diabetes Mellitus

M.Santhosh Kumar, M.Vijaya Bhaskar, N.N.Sreedevi, Siraj Ahmed Khan, M.Noorjahan, K.S.S.Sai Baba.

Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad.

Background: It has been well established that vitamin D deficiency is shown to predispose to glucose intolerance, altered insulin secretion in type 2 diabetes mellitus. Vitamin D replenishment improves he glycaemic control and insulin secretion in patients with type 2 diabetes who have established reduced Vitamin D levels.In uncontrolled diabetes, lipid profileis found to be high and is associated with micro-and macro vascular complications. Objectives: To assess vitamin D, total cholesterol/HDL ratio and HbA1c levels in confirmed controlled and uncontrolled type 2diabetes. Methodology: A observational study conducted at Nizam's Institute of Medical Sciences, Hyderabad consists of 100 cases of type2 diabetic patients. Data was segregated as per the American Diabetic Association (ADA) criteria into controlled diabetes, HbA1C<8 (n=52) and uncontrolled diabetes mellitus.> 8 (n=48). HbA1C was estimated using HPLC (BioRad) and Vitamin D by CLIA using Beckman Instrument, Lipid Profile by Photometric method (Cobas).Statistic alanalysis was performed by using Graphpad Prism software. Results: We found significant decrease in vitamin D levels in patients with uncontrolled diabetes mellitus (22 ± 9.4 ng/ml) as compared to controlled diabetes (30 ± 14.6 ng/ml, p<0.0001). The association of HbA1C with vitamin D analysed by Pearson'scorrelation coefficient and found significant negative correlation (r=-0.32, p<0.0001). There was no significant difference in total cholesterol/HDL ratio between controlled and uncontrolled diabetes and there was no significant association of total cholesterol/HDL ratio with HbA1C. Conclusion: Vitamin D levels in uncontrolled type2 diabetes mellitus is found to be significantly low with negative association with HbA1C. No significant association of total cholesterol/ HDL ratio in between controlled and uncontrolled diabetes mellitus. Our data suggests that vitamin D supplementation in uncontrolled diabetes might improve the glycaemic control and prevents long term complications associated with uncontrolled diabetes.

O-29

A Comparative Study of Serum Uric Acid and Lipid Profile in Type 2 Diabetics with and Without Retinopathy and Healthy Controls

Jaskiran Kaur, Shilpa Visen, Harjeet Singh

Biochemistry, SMS Medical College Jaipur
Email: kiranjas1991@gmail.com

BACKGROUND-Diabetic retinopathy is one of the chronic microvascular complications of T2DM caused by deleterious metabolic effects of hyperglycemia and is one of the most frequent cause of preventable blindness in middle aged population. Chronic exposure to metabolic changes with respect to diabetes may damage the microvasculature of retina resulting in diabetic retinopathy. Uric acid causes inflammation, oxidative stress and High lipid levels are known to cause endothelial dysfunction due to reduced nitric oxide which is suggested to play a role in retinal exudate formation in DR. OBJECTIVES-To estimate serum uric acid and lipid profile in type2 diabetic patients with and without retinopathy and healthy controls METHODOLOGY-This cross sectional study was conducted in department of ophthalmology and endocrinology in SMS Medical College and Hospital Jaipur.50 diabetic patients,50 patients with diabetic retinopathy and 50 healthy controls were included. RESULT- Mean serum uric acid in Group 1(diabetics with retinopathy)- UA- 5.14±1.093, Group 2(diabetics)- UA- 4.7±1.09, Group 3(controls)- UA-4.46±0.846, Mean Lipid profile in Group 1(diabetics with retinopathy) is TC= 230.9± 32.259, TG = 205±26.30, HDL = 49.40±9.49, LDL=108.104±26.77 . Group 2(diabetics) TC= 215.48±43.29, TG= 179.368 ±19.88 HDL=53.34±13.15, LDL=130.35±28.07. Group 3(controls)TC= 150.61±26.96,TG= 132.3 ±14.72 HDL=56.74 ±8.76, LDL= 132.68±30.44. P<0.05 for both serum uric acid and lipid profile. Thus we can say increase in uric acid and lipid profile can play a role in development of diabetic retinopathy. CONCLUSION-Significant increase in serum uric acid and lipid profile in patients with diabetic retinopathy shows that it can be considered as an independent risk factor. Hence it's management can prove to be beneficial for the prevention of diabetic retinopathy

Keywords: Uric acid, Lipid profile, Diabetes, Diabetic

retinopathy

O-30

Biochemical Markers Assessment for the High Performance Athletes

Sandeep Kumar

Sports Authority of India, Department of Sports Biochemistry, Faculty of Sports Sciences, Netaji Subhas National Institute of Sports, Patiala
Email: sainibiochem@gmail.com

A biomarker (biological marker) is a measurable product or substance used as an indicator of the biological state, to objectively determine the body's physiological or pathological processes. In sport, biomarkers are key parameters to assess the impact of exercise on different systems, tissues and organs. Therefore, we can estimate parameters for assessing the degree of fitness, muscle damage, hydration/dehydration, inflammation, oxidative damage, fatigue, over training, etc, which facilitate the evaluation of the response of the human body at the different levels of physical activity or training being carried out. Biomarkers can be used to measure the impact of training on the long term or the acute effect of exercise.

Keywords: Oxidative capacity, Health status, inflammation status, Training load

O-31

A Retrospective Observational Study to Compare LDH-To-Lymphocyte Ratio in Critical and Non-Critical Covid-19 Patients Admitted In Silchar Medical College, Assam; and To Assess Its Utility in Predicting the Severity of Infection

Manidip Chakraborty, Biswadeep Choudhury

Department of Biochemistry, Silchar Medical College and Hospital, Cachar, Assam, India.
Email: dr_mchak@yahoo.co.in; Phone: 9774138692

Background: As we all now aware of the fact that corona virus disease now has turned into a worst ever pandemic. The causative organism was identified as Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) and the disease is called COVID 19 infection .Maximum number of published studies suggested that mortality is higher in those group of patients who develop severe form of the disease. Early identification and categorization of COVID-19 patients are required for timely intervention to reduce the mortality and morbidity. Our study may help in early identification and categorization of severe COVID-19 patients. Methodology and principle findings: 99 adult patients of COVID-19 infection diagnosed by RT-PCR methods were included as per the inclusion-exclusion criteria. 50 of them were included from COVID ward and 49 others from intensive care units (ICU) . Data of these patients were extracted from laboratory information system (LIS). Serum lactate dehydrogenase (LDH) level and absolute lymphocyte count(ALC) of these patients during admission was obtained, ratio calculated. Then the data was analyzed statistically to compare the changes in both groups. Our principle findings were initial serum LDH and LDH/ALC ratio was significantly higher in ICU patients than those who were admitted in ward. ALC was lower in ICU patients. In all the cases difference was statistically significant. Conclusion: LDH/ALC ratio on admission can be used as a sensitive prognostic marker in COVID-19 patients which can help in early identification of COVID patients who have potential risk to develop severe disease

Keywords: Lactate dehydrogenase, Absolute lymphocyte count, COVID-19, LDH/ALC ratio.

O-32

A Study on HbA1c Levels in Patients with Psoriasis

Faizan I Asrar Nazki

Department of Biochemistry Government Medical College Srinagar J & K.
E mail: faizanazki@gmail.com

OBJECTIVES: 1. To study HbA1c levels in patients with psoriasis in the Kashmiri population. 2. To determine whether there is an association of psoriasis with hyperglycaemia. METHODOLOGY: A cross sectional study was carried out at GMC Srinagar J & K.70 cases, diagnosed for psoriasis within the age group of 18-65 years (males and females) were undertaken during the study period December 2018 to February 2021 from the department of Dermatology in the test group. An equal number of age and sex matched individuals without history of any kind of skin disease served as controls. Patients with history of diabetes,

other skin diseases, chronic diseases, hypertension, chronic smokers and alcoholics, psoriatic patients on systemic treatment for atleast 4 weeks or photochemotherapy within last 3 months and patients who didn't give voluntary consent were excluded. Blood samples were collected and analysed in the Biochemistry laboratory, GMC Srinagar. RESULTS: Psoriatic patients had significantly higher levels of HbA1c (5.41 ± 0.84 vs. 5.10 ± 0.68 mg/dl; P=0.018 than individuals without psoriasis. Prevalence of pre diabetes and diabetes in patients with psoriasis was 11.1 % and 14.2 % respectively. Odds ratio was 2.14, with 95% confidence interval 0.939-4.903; P=0.067. CONCLUSION: We observed that patients of psoriasis had significantly higher levels of HbA1c than individuals without psoriasis. Monitoring HbAIc in patients with psoriasis can aid in delaying/prevention and early diagnosis of Diabetes.

O-33

Methanolic Extract of *Andrographis paniculata* as a Potent Supplement to Anti-Snake Venom in Mitigating *Naja naja* Venom Induced Edema

Akshatha G. Nayak[1], Ashwini Aithal P[2], Nitesh Kumar[3], Smita Shenoy[4], Maya Roche[1]

[1]*Department of Biochemistry,* [2]*Department of Anatomy, Melaka Manipal Medical College (Manipal Campus), Manipal Academy of Higher Education, Manipal, Karnataka, India.*

[3]*Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research (NIPER), Hajipur, India.*

[4]*Department of Pharmacology, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India.*
akshatha.pai@manipal.edu

Objective: Edema is a prominent feature of envenomation with Naja naja (N.N). The Indian polyvalent anti-snake venom (ASV) causes anaphylactic reactions at higher doses. This study investigates the ability of methanolic extract of Andrographis paniculata (MAP) to mitigate edema formation in the presence of low doses of ASV. Methodology: There were 8 groups of female Wistar rats including, Group 1: Saline control and Group 2: venom control. In Groups 2 to 8, edema was induced by injecting 0.1ml N.N venom (0.07mg/kg) subcutaneously into the footpad. To Group 3 and 4, ASV(24µl/52.8µg) was administered intraperitoneally after 30/90 minutes of venom administration, respectively. Group 5 and 6 received MAP(280mg/kg) orally after 30/90 minutes of venom administration. Group 7 and 8 received reduced ASV (12µl/26.4µg) and MAP (280mg/kg) after 30/90 minutes of venom injection. Difference in edema across groups was measured using plethysmograph and statistically analyzed by R-ANOVA followed by Tukey's post hoc test. $p \leqslant 0.05$ was considered significant. Results: N.N venom induced significant edema ($p<0.001$) when injected into the footpad of rats. ASV could significantly ($p<0.001$) reduce venom induced edema to the extent of 46% and 28% in Group 3 and 4 respectively. MAP also showed significant reduction in edema in Group 5 (50%) and Group 6 (32%). When ASV concentration was reduced by 50% and supplemented with MAP, it showed 48% ($p<0.001$) reduction in edema. Conclusion: Being as potent as ASV, MAP can be used as an effective supplement to ASV in mitigating edema induced by N.N venom.

Keywords: Naja naja, ASV, edema, supplement

O-34

Role of Serum Ferritin as a Prognostic Marker in Breast cancer Patients

Snehal S. Sawant*, Anita R Bhatia*, S.V. Arya, Charanjeet Ahluwalia**

**Dept of Biochemistry, **Dept of Pathology, VMMC, New delhi*

INTRODUCTION: Breast cancer is the most common cancer in women worldwide. Risk of cancer increases with respect to age and menopausal status. Serum tumor markers are important tools in management of patients with breast cancer. Likewise, Ferritin belongs to a group of other molecules of potential interest whose concentration is also altered in sera of breast cancer patients. In the present study, the serum ferritin concentration was estimated in the sera of breast cancer patients before any surgical or any other treatment and compared to healthy women as controls. AIM AND OBJECTIVES: The aim of this study was to assess serum ferritin concentration in breast cancer patients and to correlate it with menopausal status of the patient. MATERIALS & METHODS: Histopathologically confirmed, 50 breast cancer female cases and age & sex

matched healthy female controls were taken from surgery OPD, over a period of one year. Level of ferritin was estimated by Sandwich Elisa using Ferritin SA Elisa kit. RESULT: Serum ferritin level in breast cancer cases (281.83±39.037 ng/ml) is statistically higher than in controls (87.19±43.69ng/ml) [p<0.001]. In breast cancer, ferritin level was higher in postmenopausal (300.73±25.33ng/ml) compared to premenopausal (228.059±11.24ng/ml) patients (p<0.001).In healthy women, statistically significant difference (p<0.001) in ferritin concentration was observed between premenopausal (51.725±18.58ng/ml) and postmenopausal women (125.79±25ng/ml). CONCLUSION: Serum Ferritin Level can be used as a prognostic marker for breast cancer and its Severity and its level is elevated in Postmenopausal Group in both breast cancer patients and healthy cases and controls.

O-35

Relationship of Anti Thyroid Peroxidase Antibodies with Thyroid Hormones Level

Neha choubey

NMCH, Patna , Email: nehachaubey.29@gmail.com

Introduction: Hypothyroidism is a widespread condition with potentially devastating health consequences that affect all populations worldwide, especially a developing society like India. Hypothyroidism is characterized by low Thyroid Stimulating Hormone (TSH) levels in our body with characteristic clinical features. Thyroid peroxidase (TPO) is a membrane bound glycosylated hemoprotein that is vital for the synthesis of thyroid hormones in our body. Objectives: We undertook this hospital based cross sectional study to determine the relationship between thyroid function tests and Anti TPO levels in hypothyroidism patients at a tertiary health care center in northern India. Methodology: Study samples were drawn and serum TSH, T4 and T3 and anti TPO antibodies were analyzed by sandwich enzyme linked immunosorbent assay. Statistical analysis were performed using Microsoft excel software. Inclusion criteria consisted of adult patients who have been clinically diagnosed with hypothyroidism. Control group consisted of patients with normal thyroid hormone levels. Results: We observed a significantly higher mean serum anti TPO antibodies in case group as compared to control group. There was a statistically significant positive correlation between serum TSH, T3, T4 levels and anti TPO antibodies in hypothyroidism patients with a P value less than 0.01. Conclusion: The results of our study support positive association of serum TSH T3, T4 levels and anti TPO antibodies in clinical hypothyroidism patients. This underlines the utility of anti TPO levels in diagnosis and treatment of hypothyroidism disorders.

Keywords: Hypothyroidism, TPO, TSH

PP-2

Role of Biomedical Innovation in Healthcare

Heena Singla
Guru Gobind Singh Medical College, Faridkot

Healthcare innovation and constant evolution of new biomedical devices has helped to address many of the challenges being faced by the healthcare industry. Innumerable medical advancements in genomics and proteomics has helped in identification, diagnosis and treatment of innumerable diseases in better and more cost-effective manner. Gene therapy has been developed for many inborn errors of metabolism as well as haemoglobinopathies. A new class of drugs called CFTR modulators evolved in last few years. These drugs correct the action of Cystic fibrosis transmembrane conductance regulator (CFTR) protein which is defective in patients suffering from cystic fibrosis. This drug has provided relief for patients with the most common CF gene mutation (deletion of F508). PARP inhibitors have been designed to delay the progression of prostate cancer in men with refractory prostate cancer and DNA repair pathway mutations. These drugs block proteins called PARP which have been known to help repair damaged DNA in case of BRCA1 and BRCA2 mutations. Immunologic advancements in migraine has helped in introduction of a new drug specifically designed for preventive treatment of migraine. This drug acts by blocking the activity of a molecule called calcitonin gene-related peptide(CGRP), which spikes during the attack of migraine. Autonomous mobile robots and automated guided vehicles function by using a combination of artificial intelligence and physical robotic elements such as robot hands, tracks and wheels. These are the latest advances in biomedical devices which are used in a fully automated clinical laboratory.

PP-3

Emergence of Protein A as a 'Universal Immunoadsorbent' In Immunoassays: A Novel Diagnostic Platform

Chandrakala Gholve, Savita Kulkarni
Radiation Medicine Centre, BARC, c/o TMH Annexe, Parel, Mumbai-400 012, kalagholve@gmail.com

Protein A, derived from cell wall of Staphylococcus aureus, has remarkable ability to bind with constant (Fc) portion of immunoglobulin molecules from several different species. So far in immunoassays, Protein A has been used as a separating reagent in the separation of bound and free ligand and as a "universal tracer". For the first time, we have described a unique and novel assay format that displays the use of recombinant Protein A coupled with magnetic particles or polystyrene tubes as a solid phase immunoadsorbent in the development of assays for TPO autoantibodies using radiolabelled recombinant TPO as the specific tracer. Sensitivity, specificity, high precision and automation of these in-house developed radioassays make them perfectly suitable for routine clinical investigations. Conventionally, different kits for different autoantibodies demand specific purified antigens or monoclonal antibodies coated on various solid phases. Whereas our assay which proposes the use of 'universal immunocapture' format; for detection of an array of autoantibodies; would help in reducing overall time and cost during the production of kits. This format also has an added advantage of oriented conjugation of the antibody thereby preserving antibody activity. In conclusion, the novelty of the assay mentioned highlights the format selected and therefore can be adopted in the development of isotopic as well as non-isotopic assays (using alternative labels like fluorophores, chemiluminescent, enzyme, etc. for laboratories that pose problems in the handling of radioisotopes), for the measurement of autoantibodies. Finally, the proposed format both in its isotopic and non-isotopic formats has the potential to revolutionize immunodiagnostics in the future.

PP-4

A Correlative Study of CRP and C3 Complement Element in Women with Polycystic Ovarian Syndrome

Indra Prasad Adhikari, Shreya Nigoskar

Dept of Biochemistry, Index Medical College Hospital & Research Center, Indore, Madhya Pradesh 452001.
Email: harshaladhikari@gmail.com,
Mobile: +91 9993531567

Objective: To evaluate the role of CRP and C3 in Women with PCOS factors related to pathogenesis of PCOS. Materials and Methods: This was a hospital-based cross-sectional prospective study carried out among PCOS was conducted in the Department of Obstetrics & Gynecology, Index Medical College Hospital & research center, Indore, M.P. The study

duration was two years. A total of 260 subjects with age groups between 15 to 45 years were divided into cases and controls. Results: Among a total of 260, 130 were diagnosed with PCOS, and 130 were healthy women based on clinical and different biochemical parameters, The mean ±SD of various parameters among PCOS cases were; BMI 32.97±8.466, TC 188.42±31.126, TG 134.43±50.01, HDL 36.29±9.55 TC/HDL ratio, 5.54±1.865 serum CRP, 3.41±0.94 C3, 160.66±29.155 versus BMI 22.87±2.470, TC 155.42±26.333, TG 110.00±42.19, HDL 41.22±10.912, TC/HDL ratio 4.08±1.39, serum CRP 2.25±0.8 c3, 127.48±35.60 in healthy control. Conclusion: In this study, the role of CRP, C3, and different biochemical parameters were studied among PCOS cases and control. It was found that a majority of the PCOS patients had increased levels of CRP, C3, and other biochemical parameters. The levels of C3, CRP as a marker of chronic low-grade inflammation were higher in PCOS as compared to the controls. The C3 values correlated well with an increase in BMI, marital status, age hirsutism.

PP-5

Application of Advanced Robotics Technology in a Clinical Biochemistry Setup: SWOT Analysis

Neha Chhawal, Simmi Kharb

Dept. of Biochemistry, PGIMS Rohtak
Email: drnehachhawal@gmail.com

Objectives: 1. To review the evidence pertaining to the application of advanced robotics technology in the Biochemistry discipline. 2. To evaluate the application using the SWOT analysis framework. Methodology: A quick literature search was conducted in MEDLINE / PubMed and Google Scholar to retrieve studies regarding the use of robots in biochemistry with terms like “robotics” or “automation” and “biochemistry”. A narrative synthesis was performed to extrapolate study findings in a SWOT framework. Results: Elaborate review of published literature in the past decade (2010-20) suggests rapid strides in the innovation and integration of automation technology in clinical biochemistry. A Likert scoring matrix (+2,+1,0,-1,-2) was developed for each item to adjudge suitability in different categories and capacity setups. a. Strengths [10]: reduced downtime [2], quality (repeatability, reproducibility)[1], rapid and bulk testing [2], operational efficiency [1], less wastage [1], work safety [2], integrated systems [1], etc. b. Weakness [-6]: high installation costs [-2], dependence [-1], difficult integration with manual processes without automation [-1], need for technical competence [-2], etc. c. Opportunities [7]: total laboratory automation [2], health informatics [2] artificial intelligence [1], point of care diagnostics [2], etc. d. Threats [-9]: lack of change management [-2], process analysis [-2], finances [-2], customization [-1], data security [-1], quality control [-1], etc. Conclusions: Advanced robotics application is overall favored and potentially instrumental in building core laboratory capacity, improving clinical, research, and training aspects.

PP-6

Binding Interactions of 4-chloro-1, 2-phenylenediamine with Human Serum Albumin: a Multispectroscopic Approach

Mohd Sharib Warsi, Safia Habib,
Abdul Rouf Mir and Moinuddin

Department of Biochemistry, Faculty of Medicine, J.N. Medical College Aligarh Muslim University, Aligarh, U.P. India ,
E-mail: sharibwarsi989@gmail.com

Objective: Hair dyes and its components have gained serious attention from scientific and research communities in the past years. The concern arises as these components have been classified as potent mutagenic and carcinogenic agents. They have the tendency to penetrate the skin, undergo self-conjugation and autooxidation, giving rise to derivatives that have the capability to modify proteins in an irreversible manner. The present study is aimed to document the strong potential of 4-chloro-1,2-phenylenediamine (4-Cl-o-PDA), a hair dye component, in the modification of Human Serum Albumin (HSA). Methodology: HSA was incubated with increasing concentrations of 4-Cl-o-PDA. The characterization of modified HSA was done with the help of various spectroscopic techniques like UV-Vis spectroscopy, fluorescence spectroscopy (Quenching of Intrinsic fluorescence, ThT binding assay), CD spectroscopy, FTIR spectroscopy, ThT microscopy and transmission electron microscopy. Results: It was observed that 4-Cl-o-PDA is potent enough to cause structural damage to HSA as observed from the results of UV-vis and fluorescence spectroscopy due to modification of the aromatic residues and quenching of the intrinsic fluorescence of HSA. The results of CD and FTIR spectroscopy point

towards the secondary and tertiary structural alterations in the protein structure. The microscopic analysis along with ThT binding assay is suggestive of fibrillar aggregates generation. Conclusion: The study concludes that 4-Cl-o-PDA used in permanent hair dye preparations, induces structural damage to HSA by altering its secondary and tertiary structural characteristics and also results in the formation of fibrillar aggregates. We are in the process of ascertaining the role of 4-Cl-o-PDA in carcinogenesis.

PP-7

CA-125 in Different Stages of Lung Cancer

N. Omita Devi[1], Oinam Prabita Devi[1], Davina Hijam[2], [1]Manipur Health Services

[2]*Department of Biochemistry, RIMS, Imphal*
E mail: prabitaoinam@gmail.com

Abstract: Lung cancer is the leading cause of cancer death for both men and women and accounts for 29 % of all cancer death. The use of tumour markers in oncology practice may reflect both stage of the disease and prognosis. CA-125 is elevated in carcinomas of ovary, lung, endometrial, pancreas, breast and colon. Objectives: To estimate serum levels of CA-125 in lung cancer patients, normal healthy individuals and in patients with benign lung diseases. Methodology: Forty newly diagnosed lung cancer patients who attended Radiotherapy OPD and/or admitted in the Radiotherapy ward, RIMS, Imphal were selected as cases. Control group consisted each of a group of 40 patients with benign lung diseases and a group of 40 normal subjects of comparable age. The study was carried out from October 2017 to September 2019. Laboratory evaluation of serum CA-125 was performed by ELISA. Results: Serum CA-125 level was significantly higher in lung cancer patients (37.12 ± 18.46 U/ml) as compared to controls. Also the level is highest in Stage IV (62.73±11.71 U/ml), followed by Stage III (41.21±16.91 U/ml), Stage II (30.45±19.11 U/ml) and Stage I (23.46±21.17 U/ml). Conclusion: Serum CA125 level might be a valuable biochemical index in the diagnosis of lung cancer. This may be useful in patients in whom tumour cannot be visualized by bronchofibroscopy or to rule out false positive cases.

PP-8

Acquired Immunogenicity of Calf Thymus DNA Modified By 4-Chloro-Orthophenylenediamine and Its Augmentation Under Nitrosative Stress: A Combined Biophysical and Immuno-Modulatory Approach

Shifa Khan, Safia Habib, Moinuddin and Asif Ali

Department of Biochemistry, Faculty of Medicine,
J.N. Medical College Aligarh Muslim University,
Aligarh, U.P. India,
E-mail: shifakhan2717@gmail.com

Introduction: Phenylenediamines (PDs) and its isomers are widely used as precursors in the preparation of hair dyes and pigments. 4-chloro-orthophenylenediamine (4-Cl-OPD), a halogenated synthetic derivative of ortho-Phenylenediamine (OPD), is used in manufacturing hair-dye formulations. The associated oncogenicity, mutagenicity, role in protein and nucleic acid modification, impact on cellular metabolism has been reported. However, the role of 4-Cl-OPD in eliciting immune response under oxidative and nitrosative stress has still not been documented to the best of our knowledge. Objective: The aim of this study was to explore: 1. The structural changes on calf thymus DNA molecule in presence of 4-Cl-OPD. 2. The synergistic effect of nitric oxide (NO) on DNA in presence of 4-Cl-OPD. 3. Heightened immune response of structurally altered DNA in New Zealand White (NZW) rabbits. Methods: The characterization of modified DNA was done by UV-vis and FTIR spectroscopy, agarose gel electrophoresis. The immunogenicity of the modified DNA in experimental animals was probed with the help of direct ELISA, competitive inhibition ELISA and electrophoretic mobility shift assay (EMSA). Observations and Conclusion: The results suggest that, 4-Cl-OPD induces significant structural alterations on the DNA molecule and this damage is synergistically enhanced under influence of NO. As compared to ROS-DNA, the RNS-DNA is more potent in inducing strong immune response in NZW rabbits. The modified DNA acquires neo-epitopes which results in the generation of antibodies in experimental animals, EMSA and ELISA confirmed the specific but cross-reactive nature of these isolated antibodies. The study can form a basis for establishing relationship between the use of hair dyes and progressive inflammatory response leading to carcinogenic trigger.

PP-9

Evidence of Impact of Alterations in p53 on Expression of hTERT, VEGF and MMPs Oral Cancer Patients

Ragini D. Singh[1], Kinjal A. Patel[2], Prabhudas S. Patel[2]*, Sagar Dholariya[1], Deepak Parchwani[1]

[1]*Department of Biochemistry, All India Institute of Medical Sciences (AIIMS), Rajkot-360110, Gujarat, India*

[2]*Molecular Oncology Laboratory, Cancer Biology Department, The Gujarat Cancer & Research Institute, Asarwa, Ahmedabad -380 016, Gujarat, India*

Objective : We aimed to assess the influence of alterations of p53 gene and its negative feedback regulator, MDM2, on the expression of hTERT, VEGF and MMPs, the critical genes involved in oral cancer progression. Material and methods: p53 mutation analysis, p53 and MDM2 genotyping was performed using PCR-SSCP, sequencing and PCR-RFLP, respectively. mRNA expression levels of hTERT, VEGFA isoforms, MMP2 and MMP9 were analyzed by semi-quantitative reverse transcriptase PCR. Results: Expression of hTERT, VEGF A isoforms, MMP2 and MMP9 were significantly altered in the presence of p53 alterations and MDM2 polymorphisms in specific combination. p53 exon 4 (Arg allele) was significantly associated with overexpression of hTERT, MMP2 and MMP9 individually. Mutant p53, Arg allele at p53 exon 4 locus and G/G/or T/T genotype at MDM2 in specific combinations were associated with increased expression of hTERT, VEGF A isoforms and MMP2/9. Conclusion: This study provides the evidence that not only mutant p53, SNPs in p53 codon 72 (Arg72Pro)(rs1042522) and MDM2 (rs2279744) play a significant role in altering expression of hTERT, VEGF-A isoforms and MMP 2/9 in various specific combinations. The interaction of p53 codon 72 SNPs with MDM2, hTERT, VEGF-A isoforms, MMP2/9 play a part in aggressiveness of oral cancer. The results should be explored for innovative treatment options.

PP-10

Comparative Analysis of Chemotherapeutic Drug Using Temozolomide, Carmustine and Bevacizumab for Reverse Regulation of Oncogenic miRNA in Glioblastoma Treatment

Roji Begam1*, Ashish Kumar Yadav[1], Arshi Siddiqui[1], Neha Masarkar[1], Ashok Kumar[1], Jagat R. Kanwar[1], Narendra Choudhary[2], Archana Tiwari[3], Adesh Shrivastava[4], Rashmi Chowdhary[1]

[1]*Department of Biochemistry,* [2]*Department of Paediatrics,* [4]*Department of Neurosurgery, All India Institute of Medical Sciences (AIIMS) Saket Nagar, Bhopal, 462020*

[3]*School of Biotechnology, Rajiv Gandhi Proudyogiki Vishwavidyalaya Bhopal, 462036*
**Email ID: rojikhan03@gmail.com*

Introduction : Glioblastoma (GBM) has very poor prognosis in patients with high mortality rate. Current treatment has limitations as these tumor locations are inaccessible by systemic therapies due to BBB, also it is impossible to remove all tumor cells during surgical resection, making relapse inevitable. Studies indicate that several upregulated miRNAs are involved in GBM progression. We propose a comparative analysis of chemotherapeutic drug treatment regimen for GBM which will be the most efficient to downregulate oncogenic miRNAs resulting in down regulate the tumour progression and better survival of GBM patients. Objective: 1. To determine the in -vitro expression of upregulated miRNA in GBM cell line (LN-229) 2. In-vitro analysis of miRNA with anti-tumor drugs in GBM cell line (LN-229). Methodology: Expression of microRNAs (miR-10b, miR-21, miR-34a, miR-221, miR-15b) in LN-229 cell lines will be evaluated using qRTPCR. GBM cell line will be treated by TMZ, carmustine and bevacizumab. Cytotoxicity assay using MTT will be carried out. To check the inhibitory/apoptotic effect of these drugs on oncogenic upregulated miRNA expression. Result: The proposed study would suggest a comparative chemotherapeutic drug treatment approach towards inhibition of

oncogenic miRNA in GBM patients for better prognosis and survival rates. Conclusions: This study would help us to identify an effective and efficient therapeutic treatment regimen against GBM. Proposed work will lead to understand the role of miRNA in glioblastoma at the tertiary care hospital of central India, which could serve as the prognostic biomarkers and target for the development of therapeutics of glioblastoma.

Keywords: Bevacizumab, Carmustine, Glioblastoma, miRNA, Temozolomide.

PP-11

Case report of Hypoglycaemia in Tumour

Kuldeep Kumar Gupta

Magamana Pandit Madan Mohan Malviya Cancer Centre, Varanasi

Background : Hypoglycaemia (blood glucose < 40mg/dl) is a life threatening condition in both healthy as well as in person with comorbidities. In normal condition brain utilises glucose as energy source while in hypoglycaemia it switches to utilise ketones to fulfil its energy requirement. In tumour, the normal aerobic glucose metabolism is shifted to specialised fermentation leading to formation of ketones. Case presentation- A 41 yr male presented with pain in abdomen, generalised body swelling and vomiting. On physical examination there is mild hepatomegaly. Peripheral blood examination shows Hb 12.8 mg %, TLC 8400 Cells /mm^3, Platelets 2,48000 /mm^3, and RBS 37 mg/dL. Patients were diagnosed as multicentric hepatocellular carcinoma. Besides having low blood sugar patients was fully conscious, oriented with intact sensory and motor function and had no signs and symptoms of hypoglycaemia. Discussion- Hypoglycaemia in hyper leucocytosis may be artefactual, caused by dramatically higher invitro glycolysis by abnormal leucocytes, but in this patients hypoglycaemia was not artefactual because peripheral blood leucocytosis was absent. In this case there is a specialised fermentation of glucose over aerobic respiration due to Warburg effect. It is a form of modified cellular metabolism found in cancer cells, leads to conversion of pyruvate, into lactate and generation of ketone bodies conclusion- In tumour patients due to Warburg effect there is an adaptation mechanism to increased glucose consumption as a carbon source for biosynthetic requirements for proliferation of tumour cells. Generation of ketone bodies keep survive the individuals even under very low blood glucose level.

Keywords: Hypoglycaemia, Warburg effect, Tumour, Glucose.

PP-12

A Comparative Analysis of PreOp and Post Op Oxidative Stress in Patients with Primary Bone Tumors

Vasudha Dhupper, Kiran Dahiya

Department of Biochemistry, Pt. BD Sharma PGIMS, Rohtak –124001, Haryana

INTRODUCTION: Oxidative stress is found to be increased in patients with bone tumors which can be indicated by the increased malondialdehyde (MDA) levels. Malondialdehyde itself may lead to the alteration of the enzyme, pyruvate kinase. Therefore, this study was planned to estimate the levels of MDA in patients of bone tumors before and after surgical treatment. METHODOLOGY: This study was conducted on 50 patients of Bone tumors , benign as well as malignant and 50 healthy controls. The levels of malondialdehyde were estimated in the haemolysate in the controls and in the patients at the time of diagnosis. Another sample was taken after surgery in benign bone lesions and after treatment completion in malignant lesions i.e. last Chemo / Radiotherapy cycle. RESULTS: The levels of malondialdehyde were found to be increased significantly in patients with Bone tumors as compared to the controls (p value <0.001) and decreased significantly after final management (p value <0.001).

PP-13

A Commonly Present Hair Dye Pigment 4-Chloro-Orthophenylenediamine (4-Cl-Opd) Causes Structural Changes on Calf Thymus DNA, a Possible Cause for Triggering Malignant Changes

Safia Habib[1], Shifa Khan[1], Asif Ali[1] and Shahid Ali Siddiqui[2]

[1]Department of Biochemistry, [2]Department of Radio Therapy
J.N.Medical College, A.M.U, Aligarh
Email: saf_h75@yahoo.co.in

Objectives: To estimate and analyze the: Interaction between a commonly found hair dye pigment 4-chloro-orthophenylenediamine (4-clOPD) and calf thymus DNA. Structural alterations incurred on DNA molecule due to 4-cl-OPD (4-cl-OPD-DNA). Interaction of peripheral cancer auto antibodies with 4-clOPD-DNA. Methodology: Molecular docking was done to check site specific interaction of 4-cl-OPD and DNA. Structural alterations were analyzed through spectroscopy, Agarose electrophoresis, Tm, Electron microscopy, NBT and Hydroxy radical assay. ELISAs were used to access cross-reactivity of antibodies in the peripheral blood of cancer patients with 4-clOPD-DNA. (History of hair dying for ⩾ 5years). Results: 4-cl-OPD preferably interacted at cytosine and guanidine of minor groove. Caused oxidative structural damage of DNA at concentration ⩾ 100µM. Hyperchromicity>45%; NBT reduction>57.3%; 1.5° decrease in Tm. Cross reactive antibodies were detected against 4-cl-OPD-DNA ($p<0.05$). Conclusion: Permanent hair dying solution with brands names and high market value contain derivatives of phenylenediamines. Structural changes on DNA may trigger irreversible pro-inflammatory responses. Continuous exposure may be one of the causes for increasing occupational health hazards. Excessive use of permanent hair dye may induce malignant changes.

Keywords: Hairdye, Cancerautoantibodies, Molecular Docking, ELISA

PP-14

The Structural Modification of Calf Thymus DNA by Methyl Methane Sulfonate Produces Methylated DNA

Mohd Mustafa, Safia Habib, Asif Ali, Shahid Ali Siddiqui, Moinuddin

Department of Biochemistry, Faculty of Medicine, Jawahar Lal Nehru Medical College, Aligarh Muslim University, Aligarh (202002)
Email: mohdmustafagc7251@gmail.com

Objectives: The structural and conformational alterations in calf thymus DNA (ct-DNA) upon treatment with methyl methanesulfonate (MMS) using biophysical and computational methods. Methodology: The alkylation damage induced by MMS on ct-DNA was studied through various biophysical techniques like S1 nuclease assay, UV-vis, FT-IR spectroscopy, ITC, scanning and transmission electron microscopy. Interaction between DNA and MMS at the molecular level was assessed through computational methods like Molecular docking and MD simulation. Results MMS is an alkylating agent that methylates ct-DNA in a dose-dependent manner. Here, spectroscopic approaches and gel electrophoresis confirmed MMS-induced methylation bring out conformational change, DNA fragmentation and lessened ct-DNA stability. MMS creates single-strand breaks in the DNA as shown in the nuclease S1 assay. Denaturation of DNA is observed by UV-vis spectra. FT-IR results stipulated MMS-mediated direct-strand breaks in DNA. Fibrous aggregates in MMS-DNA are shown by the ITC. Molecular docking found MMS in close contact with the ribose sugar of DNA backbone possess non-bonded interactions. Molecular dynamic simulations confirmed that MMS is capable of interacting with DNA at two levels, one at the level of nitrogenous bases and another at the DNA backbone. Conclusion The results of the present study confirmed that adenine and guanine bases of the DNA are the primary methylation center upon MMS treatment. The methylated DNA is mutagenic in nature and its high levels may lead to mutations in DNA molecules which can lead to cancer progression.

Keywords: ct-DNA, MMS, methylation, mutations.

PP-15

To Estimate the Level of Copper and Zinc in Newly Diagnosed Breast Cancer Patients

Vinay Gahlot, Neha Sharma, Ashish Sharma

Department of Biochemistry, Geetanjali Medical College and Hospital, Udaipur, Rajasthan. Email:vinay.gahlot89@gmail.com

Objective: The objective of the study was to find out any co relation between the levels of copper and zinc(trace elements) in severity of breast cancer. Methodology: This study was conducted in Geetanjali Medical College and Hospital from May 2015 to May 2016. The levels of copper and zinc are estimated through the Semi – Auto analysers. Results: Level of serum copper is higher and level of serum zinc is lower in patients. Conclusion: This study concludes that,serum copper and serum zinc can be used as an early marker in the diagnosis of breast cancer and providing proper supplementation of these trace elements may improve the prognosis of breast cancer patients

Keywords: Breast Cancer, copper, zinc, serum, analyser

PP-16

Modification of Chitosan: A Wonder Molecule of Ocean against N-Nitrosodiethylamine Induced Hepatocellular Carcinoma in Male BALB/C Mice

Anushree U[1], Sachin Shetty[1], Rajesh Kumar[2], Sanjay Bharati[1]*

Department of Nuclear Medicine,
[1]Manipal College of Health Professions, Manipal Academy of Higher Education, Manipal 576104, Karnataka, India.

[2]All India Institute of Medical Sciences, Jodhpur, Rajasthan (342005), India.

Chitosan is a natural deacetylated product obtained from crustacean chitin that can be tailored to obtain compounds for directing and treating various cancers. In the current study we describe the development and anticancer potential of chitosan altered by phosphorylation and galactosylation (P-GC). Modified compound was characterized for its chemical properties, biological compatibility and assessed for its therapeutic efficacy against N-nitrosodiethylamine induced hepatocellular carcinoma in male BALB/c mice. Chemical alteration of chitosan enhanced several properties such as solubility, antioxidant and chelating ability. Further, several tumour parameters displayed strong anticancer potential of P-GC against hepatocellular carcinoma. 50% increase in number of animals without the tumours and 85% reduction in total number of tumours were evident after P-GC therapy. Electrical properties of P-GC treated group were also suggestive of hampered hepatocarcinogenesis. In general, alteration of chitosan using these approaches exhibited significant therapeutic effect against hepatocellular carcinoma.

Keywords: Chitosan, Phosphorylation, Galactosylation, NDEA, liver cancer, hepatocellular carcinoma

PP-17

Study on Role of DCP in HCC among South Indian Population

S. Sundaresan

SRMMCH&RC, SRMIST, SRM Nagar, Chengalpattu Dt, Tamil Nadu India.
Email:ssunsrm@gmail.com; Phone 9444431627

Background: Hepatocellular carcinoma (HCC) is the primary and most common malignant tumor of liver and it is considered as the fifth most common cancer worldwide. As per the data available, the incidence of HCC in India is 1.6% per yearThe prevalence of India varies from 0.2 to 1.6%. Several researchers were keen to assess the role of novel tumor markers in blood and body fluids for their clinical ability to diagnose HCC at the earliest. Objectives: The aim of this study is to determine the role of tumour markers in hepatocellular carcinoma individuals and the risk factors associated with HCC. Methodology: A total of 210 HCC individuals from the Hepatology Unit, Gleneagles Global Health City, Chennai, were enrolled in this study. Patients with HCC were clinically diagnosed according to clinical examination, radiological investigation [US/CT] and laboratory investigations. Additionally, 30 cirrhotic individuals and 30 healthy subjects were included as a comparative group.. Results: The tumor marker DCP were determined by ELISA method using the G-Biosciences ELISA kit (G-Biosciences, USA) according to the manufacturers' protocol. Serum samples from

HCC individuals, cirrhotic cases and healthy individuals were used for tumor markers determination and the results were analyzed using Bio-Rad analyser. Results showed that DCP had the sensitivity of 81.0% and specificity of 88.4% with 95% CI. The criterion value for the marker was ⩽ 56.96 ng/mL. The Youden index value was 0.7. Conclusion: We found that the tumor markers DCP showed better sensitivity and specificity when compared with the existing marker AFP.

Keywords: HCC, DCP, LIVER, CANCER

PP-18

Grading of Psoriasis by Inflammatory Markers

Neela B. Mannangi[1*], Bassavaraj Devaranavadagi[2*], Balachandra S. Ankad[1#], Shankarprasad Ds[1*]

**Dept of Biochemistry, [#]Dept of Skin*
[1]SNMC & HSK, RC Bagalkot, [2]BLDE Vijayapur

Objectives: To estimate and compare in TNF-α, IFN-γ, IL-2 in Psoriasis and controls. To correlate these parameters with PASI score in Psoriasis. Methodology: The study was conducted at S N. Medical College and H S K Hospital and Research Center, Bagalkot, Karnataka. Clearance from the Institutional Ethics Committee (IEC) was obtained. Written informed consent was obtained from the patients prior to the collection of blood sample. It is a Case-Control study with duration 2years. The study group included 110 diagnosed psoriasis and 110 healthy controls matched for age (20-60 yrs) and sex were considered. Results: In the present study there was significant increase in inflammatory markers in psoriasis compared to controls. This increase showed significant correlation between with PASI score, however there was no statistical significance between the severity of disease. Conclusion: The present study concludes that the inflammatory markers are increased in psoriasis patients and this is correlated with PASI score. Psoriasis being inflammatory skin disease these inflammatory markers which are not routinely done a care has to be taken while treating particularly patients with severe PASI score as they are prone for cardiovascular risk.

PP-19

Correlation of CA242, and Sialic acid level in Pre-operative and Post-operative Colorectal Cancer Patient

Kalpana Kumari[a], Ravi Shekhar[a], ManishKumar[b], Rekha Kumari[a], Santosh Kumar[a], Archana Bharti[a]

[a]Department of Biochemistry, [b]Department of Oncosurgery , IGIMS, Patna

Introduction: Colorectal cancer (CRC) is a formidable health problem worldwide. It is the third most common cancer in men and the second most common in women. In India, annual incidence rates (AARs) for colon cancer and rectal cancer in men are 4.4 and 4.1 per 100000, respectively. Sialic acid and CA 242 are important tumour markers in CRC. Objective: To correlate serum CA242, and serum Sialic acid levels in pre-operative and post-operative CRC patient. Methodology: The patients attending the State Cancer Institute at IGIMS, Patna with colorectal cancer (n=15) were included in the study for a period of 6 months. Serum CA242 level by ELISA method and serum sialic acid level by Ninhydrin Method. Statistical Analysis: Paired t-test was done to compare groups and Pearson correlation coefficient was evaluated for correlation between the parameters. Results: The mean level of sialic acid pre and post operative cases was 1.76±0.15 & 1.17± 0.59 respectively and for CA242 was 49.5±33.3 & 31.8±22.6 respectively. There was a significant difference between pre and post operative serum sialic acid and CA242 level ($r=0.566, p=0.028$) ($p<0.05$). Conclusion: The prognosis is found to be better after the surgical resection of CRC.

Keywords: Serum CA242, Sialic acid, Colorectal cancer, Pre & Post operative

PP-20

A Case Report on Hook Effect: A Diagnostic Enigma

Pratibha Gavel

Mahamana Pandit Madan Mohan Malviya Cancer Centre & Homi Bhabha Cancer Hospital (A unit of TMC, Mumbai) Varanasi, Uttar Pradesh

Objectives: To overcome the diagnostic aberrancy arising out of Hook effect in a cancer patient Methodology: Biochemistry Laboratory received a sample of 28 year old female IPD cancer patient to estimate ThCG level. After processing the sample by chemiluminescence immunoassay the value was estimated to be 733mlU/mL and reported. The laboratory again received the sample for the same two days later. The value was estimated to be 568 mlU/ml. The Oncologist called the lab and discussed the suspicion of the patient's clinical condition to be suggestive of significantly higher value. Upon assessment, all the quality data was found to be satisfactory. Hence, a serial dilution of fresh sample was performed and result was obtained at higher dilution. Results: Final value of ThCG was estimated to be 962000mlU/ml. Conclusions of Study In immunoassay; there is always a possibility of falsely low value being reported due to excess of antigen/antibody. With limited clinical data available, it is difficult to suspect such conditions at laboratory level. Therefore in cancer patients, where clinical conditions suggest high value there should be strong communication between the clinician and lab physician. Possibility of hook effect should be avoided by maintaining high index of suspicion and by performing serial dilution of sample.

Keywords: Cancer, Chemiluminescence, Hook Effect, ThCG

PP-22

Development of Tongue Squamous Cell Carcinoma Involves Downregulation of Lipid Phosphate Phosphatase 3

Supriya Vishwakarma[1,2], Deepti Joshi[3], Sarita Khare[4], Ragini Gothalwal[2] and Ashok Kumar[1]

[1]*Department of Biochemistry, All India Institute of Medical Sciences (AIIMS), Saket Nagar, Bhopal 462020 India;*

[2]*Department of Biotechnology, Barkatullah University, Hoshangabad Road, Bhopal; 462026*

[3]*Department of Pathology and Lab Medicine, All India Institute of Medical Sciences (AIIMS), Saket Nagar, Bhopal 462020 India.*

[4]*Department of Zoology, Govt. Maharani Laxmi Bai Girls P.G. Autonomous College, Bhopal 462010 India. Email.ID:v.supriya2009@gmail.com*

Objectives: In India, oral cancer is the most common cancer in men. Sphingosine-1-phosphate (S1P), an oncogenic lipid has a significant impact on the processes of carcinogenesis. However, the role of S1P signaling in oral carcinogenesis has not been fully understood. Therefore, the objective is to determine the role of S1P metabolizing genes{SphK1-2, SGPP1-2, SGPL1 and lipid phosphate phosphatase (LPP)1-3}in oral carcinogenesis. Methodology: Mouse (C57BL/6) model was developed by a chemical carcinogen, 4-nitroquinoline-1-oxide (4NQO, 100 µg/ml),through drinking water. Mice were divided into 5-groups (N = 12/group). Group 1 (vehicle control) were given polyethylene glycol, group-2 to 5 were given 4NQO for a period of 8, 12, 18, and 18+8 (after 18 weeks of 4NQO treatment, switched to normal drinking water for 8-weeks).After euthanized by CO2 asphyxiation, tongues were excised , fixed in 10% buffered-formalin and flash frozen in liquid nitrogen for histology and quantitative RT-PCR respectively. Blood was collected for S1P measurement by LC-MS. Results: Haematoxylin &Eosin staining showed the development of moderately differentiated tongue squamous cell carcinoma (in the 18+8 group) that progressed through hyperplasia and neoplasia. SphK1 was found to be up-regulated, whereas

LPP3 gene was found to be consistently down-regulated even at the early stages of oral carcinogenesis.S1P levels in plasma were also found to be increased during carcinogenesis as compared to control. Conclusions: The elevation of SphK1, and concomitant downregulation of LPP3, in the mouse tongue, may lead to S1P accumulation and may result in the progression of oral carcinogenesis. Thus, SphK1 and LPP3 could play an essential role in the OSCC.

Keywords: Sphingosine-1-phosphate, Oral cancer, Tongue Squamous Cell Carcinoma, LPP3

PP-23

A COMPARATIVE STUDY OF SERUM FERRITIN AND GGT IN BREAST CANCER PATIENTS AND HEALTHY CONTROLS

Diksha Singh, Mukesh Kumar Jat, Shakuntala Saini

Department Of Biochemistry, SMS Medical College, Jaipur, India, E-mail:dikshathoughts@rediffmail.com

AIM AND OBJECTIVES: To study biochemical markers among breast cancer patients with healthy controls. MATERIAL AND METHOD: A cross sectional study was conducted in Biochemistry Department and Surgery Department at SMS Medical College and Hospital,Jaipur.35 Patients with breast cancer and 35 Healthy controls were included. RESULT: In this study high ferritin levels were observed in patients with breast cancer (116.20±41.35 mcg/L) as compared with healthy controls (38.85±29.76mcg/L) and high GGT levels were found (54.28±20.15 IU/L) in breast cancer patients as compared to healthy controls(19.37±10.25IU/L). P value is<0.001 in both.

CONCLUSION: This study shows that breast cancer patients presented with high ferritin andGamma GlutamylTransferaselevels in comparison to healthy controls so we can conclude that these can be used for early diagnosis.

Key Words: Breast Cancer, Gamma Glutamyl Transferase, Ferritin

PP-24

Possible Role of Organochlorine Pesticides (OCPS) Exposure as Etiological Factor in Breast Cancer

Thammineni Krishna Latha, B D Banerjee, Navneet Kaur, Gaurav Kumar Thakur

Environmental and Molecular Biology Laboratory, Department of Biochemistry, University College of Medical Sciences (Delhi University) and GTB Hospital, Dilshad Garden, Delhi, India.

Objectives: i. To estimate the Organochlorine Pesticides level in breast cancer patients. ii. To compare the OCP levels within breast cancer patients based on lymph node metastasis, and stage. Methodology: The study has recruited 100 breast cancer cases and 100 benign breast disease patients as controls. Study was conducted in the Department of Biochemistry in collaboration with Department of Surgery, at UCMS (University of Delhi) and GTB hospital. OCPs were extracted from breast tissue by Hexane & Acetone Method. Clean up of the samples was done by flurocil column. Quantification of OCPs was done by Gas Chromatography system equipped with 63 Ni Electron Capture Detector. Results: Significantly higher levels of γHCH, β-Endosulfan, p'p'DDT and o'p'DDT were found in cases with respect to controls ($p<0.05$). The odds ratios (ORs) show a significant association of β-Endosulfan (4.1) and p'p'DDT (2.2) levels with risk of breast cancer. Further, significantly higher levels of γHCH, p'p'DDT and β-Endosulfan were found in lymph node metastasis cases and γHCH and pp'DDD in advanced tumor stage cases as compared to the cases without lymph node involvement, and early tumor stage respectively. Conclusions: The findings of the present study support the contribution of OCPs in the pathophysiology of breast cancer. Further, OCPs like pp'DDT, Endosulfan-II, and γHCH may promote the progression of breast cancer by influencing the metastatic ability through lymphatic pathway. The current study reflects the magnitude of pesticides pollution in India and signifies the distribution and accumulation of these compounds in women with breast cancer.

Keywords: Breast cancer, Benign breast disease, Organo chlorine Pesticides, lymph node metastasis

PP-25

GDF-15 Induces Drug Resistance in Breast Cancer Through FOXM1

AnupamaModi[1], Dipayan Roy[1], Jeewan Ram Vishnoi[2], Puneet Pareek[3], Poonam Elhence[4], Shailja Sharma[1], Praveen Sharma[1], PurviPurohit[1.]

[1]Department of Biochemistry, [2]Department of Surgical Oncology, [3]Department of Radiotherapy, [4]Department of Pathology& Lab Medicine,

All India Institute of Medical Sciences (AIIMS), Jodhpur, Rajasthan, India

Objectives: Stemness, a key component of breast cancer (BC) heterogeneity. Growth differentiation factor-15 (GDF-15), inflammatory cytokine, upregulated in different cancers. ABCC5 is surface protein involve in drug resistance. In this study, the expressions and interactions of GDF-15, FOXM1, andABCC5 were evaluated in BC. Methodology: 40 diagnosed BC patients and 40 healthy controls were included in this study. Serum GDF-15 was analysed through ELISA. Expressions of GDF-15, ABCC5 and FOXM1 in BC tissue were determined by RT-PCR. Results: Expression of serum GDF-15 was observed to be significantly higher in BC patients compared with healthy control ($p<0.001$). Further, the fold change expressions of GDF-15 higher (2.69 folds) in cancer tissue as compared to surrounding control tissue. Moreover, expression of ABCC5 and FOXM1 observed to be 5.1 and 3.5 folds respectively higher in BC tissue compared with healthy tissue. Tissue GDF-15 expression also showed significant association with ABCC5 ($p<0.001$), and FOXM1 ($p<0.001$). Conclusions: GFD-15 in a potential diagnostic marker for BC. GDF-15 showed significant positive association with ABCC5 and FOXM1, suggesting that GDF-15 mediates drug resistance through FOXM1.

Keywords: Breast cancer; GDF-15; ABCC5; FOXM1; Drug resistance

PP-26

Free PSA- A Sensitive Upcoming Marker in Evaluation of Carcinoma Breast

Asha Premlata Omega Oraon[1], Bela Rose Ekka[2]
Department of Biochemistry,

[1]MGM Medical college, Jamshedpur, Jharkhand
[2]RIMS, Ranchi

Objective : To estimate the value of Total and Free PSA and to prove that Free PSA is more sensitive marker in Carcinoma Breast Method- The study was conducted in 50 female patients with Carcinoma Breast and 50 normal healthy females in RIMS, Ranchi Results- We estimated the levels of free PSA and Total PSA in all patients and found that Free PSA was more sensitive and specific markers in Carcinoma Breast Conclusion- Hence to conclude from my study is that free PSA is definitely more significant and upcoming marker in Carcinoma Breast

Keywords : Total PSA, Free PSA, Carcinoma Breast, Markers

PP-27

Serum Lysyl oxidase levels and Lysyl Oxidase Gene Polymorphism in Ovarian Cancer patients of Eastern Indian population

Suchitra Kumari[1*], A. Raj Kumar Patro[2],
Baijayantimala Mishra[3*],
Saubhagya Kumar Jena[4*], Sweta Singh[4*]

[1]Department of Biochemistry, [3]Department of Microbiology, [4]Department of Obstetrics & Gynaecology

**All India Institute of Medical Sciences, Bhubaneswar, India*

[2]Kalinga Institute of Medical Sciences, KIIT University, Bhubaneswar, India
Email ID: suchitrakumari76@gmail.com

Objectives : Lysyl oxidase (LOX) is an extracellular matrix enzyme for covalent cross linking of collagen and elastin. It plays dual role in carcinogenesis and studies show higher risk of cancer in LOX G473A variants. The

present study evaluated the pattern of rs1800449 polymorphism and serum LOX levels in ovarian cancer patients. Methodology: Serum Lysyl oxidase levels were estimated in eighty three primary ovarian cancer patients (cases) and eighty six healthy individuals (control) by ELISA. Polymorphism of rs1800449 of LOX gene was detected by polymerase chain reaction (PCR)-restriction fragment length polymorphism (RFLP) method. Selected samples were sequenced to ascertain the LOX gene polymorphism findings. Results: Serum Lysyl oxidase level was significantly higher in ovarian cancer patients as compared to control. Serum Lysyl oxidase levels in early stage ovarian cancer patients was 3.28 + 0.66 ng/ml as compared to advanced stage (with FIGO stage III, IV) 5.01 + 1.05 that was statistically significant. On genetic analysis, wild type GG genotype as reference, it was found that genotypes AA were associated with a significant risk of epithelial ovarian cancer (OR 3.208, P value- 0.033). A allele of rs1800449 polymorphism of LOX gene , compared to referent G allele, the odds ratio was 1.866 (95% Confidence Interval 1.112-3.16) which was found statistically significant (P value =0.017) Conclusion: A allele of rs1800449 polymorphism of LOX gene has increased risk of ovarian cancer in East Indian population. Serum Lysyl oxidase levels could be a potential biomarker for diagnosis and prognosis of ovarian cancer.

Keywords : Lysyl Oxidase, Single nucleotide polymorphism, Ovarian cancer, Restriction fragment length Polymorphism

PP-28

Modulation of the Cardiac Biomarkers by Resveratrol: An *in silico* Molecular Modeling Approach

Shireen[1], Anjum Chugtai[2], Abbas Ali Mahdi[3] and Najmul Islam[1]*

[1]*Dept. of Biochemistry,* [2]*Department of Medicine, Faculty of Medicine, J N Medical College, Aligarh MuslimUniversity, Aligarh, UP, India;*

[3]*Department of Biochemistry, King George's University, Lucknow, U.P. India.*
**Email: nxi7@hotmail.com*

Objective: Cardiac biomarkers are substances that are released into the blood when the heart is damaged or stressed. Cardio protective effect of natural compounds in in vitro culture cells from patients with myocardial infarction was probed using Resveratrol, which is a natural polyphenol. Methods: After taking prior consent from patients and Institutional Ethical clearance, peripheral blood mononuclear cells (PBMC's) were isolated by ficoll density gradient method from blood of MI patients. PBMCs thus obtained were employed in culture studies. The 24 hr culture supernatants were subjected to evaluation of cardiac as well as inflammatory markers namely CK, Troponin, TNF-α and GPx with Resveratrol. Results: Culture supernatants (24 hr) obtained as said above from myocardial infarction patients showed increased levels of CK, Troponin, TNF-α and GPx. Co-culturing with 20 µg/ml of Resveratrol exhibited a remarkable degree of amelioration in the level of these biomarkers. Conclusion: The red wine polyphenol as well as a potent natural antioxidant, namely, Resveratrol remarkably downregulated cardiac biomarkers CK-MB and troponin expressions in cell culture studies which is supported by in-silico molecular docking study. Thus, resveratrol is having the potential to act as a safe and economical adjunct in the management of MI.

Keywords: Resveratrol, Myocardial infarction, Cardiac biomarkers, Inflammatory markers

PP-29

A Study on Oxidative Stress and Lipid Profile in Hypertensive Patients of Different Blood Groups

Shalini Arora[1], Shrawan Kumar[2], Pawan A Kulkarni[1], Pallavi Anand[1]

[1]*Department of Biochemistry,* [2]*Department of General Medicine,*
Rama Medical College Hospital & Research

Objective : To study a possible relationship of oxidative stress and lipid profile in hypertensive patientsof ABO blood groups. Methodology- The study was conducted on sixty patients with essential hypertension and sixty normal healthy control males in the age group of 45-65 years. These groups were divided into four groups on the basis of their blood groups A, B AB and O comprising 15 subjects in each group. The study consists of anthropometric parameters age, body mass index (BMI), systolic and diastolic blood pressure (SBP, DBP), pulse rate and lipid profile serum triglycerides (TGs) total cholesterol (TC), low density lipoprotein cholesterol (LDL-C), very low-density lipoprotein cholesterol

(VLDL-C) high density lipoprotein cholesterol (HDL-C) and lipid peroxide. Mean and standard deviation was calculated separately for all the groups. The source of variation was assessed by unpaired student t –test. P value less than 0.05 was considered as significant. Karl Pearsons Coefficient of correlation was used to find correlation between two parameters. Results-We have observed significantly higher values of serum lipid profile and lipid peroxide in patients with antigen A., B and AB along with decreased levels of HDL-C. A significant ($p<0.05$) positive correlation were observed between serum TGs and TC with lipid peroxide in group A ($r=0.62$; $r=0.52$) B ($r=0.28$; $r=0.46$,) and AB patients ($r=0.18$; $r=0.28$) whereas in group O these parameters were found negatively correlated ($r=-0.12$). Conclusion-The study concluded that patients with blood group A, B and AB are more susceptible to oxidative stress and impaired lipid peroxide as compared to that of blood group O.

Keywords : Hypertension, Blood groups, Oxidative Stress, Lipid Profile

PP-30

Effect of eNOS Gene Polymorphism and the Risk of Premature Coronary Heart Disease

Thirunavukkarasu Jaishankar,
Meera Shivasekar, V.M. Vinodhini

Department of Biochemistry, SRM Medical College Hospital & Research Centre, SRMIST, Kattankulathur, Kancheepuram - 603 203, Tamil Nadu, India

Polymorphism of endothelial nitric oxide synthase (T-786C) gene has an impact on nitric oxide bioavailability and also modifies oxidized LDL production during CHD. There are limited and controversial data regarding the impact of polymorphisms of eNOS gene that is implicated in the vasoconstrictive properties of the endothelium in the pathogenesis of premature coronary heart disease. The aim of the study is to evaluate the effect of T786C genetic polymorphism on NO and oxidized LDL levels and the risk of premature coronary heart disease. This Cross-Sectional study was conducted in SRMCH&RC on 100 angiographically proven CHD subjects attending the Department of Cardiology and 100 controls from MHC in age group of d"45 years. Overnight fasting plasma samples were collected for the assessment of Lipid Profile along with nitric oxide and oxidized LDL by using ELISA assay. The eNOS gene T786C was amplified by using Polymerase Chain Reaction and Restricted fragment length polymerization. In eNOS T 786C gene polymorphism, the distribution of TC genotype ($P = 0.012$), CC genotype ($P = 0.009$) and minor C allele frequency ($P = 0.002$) a significant variation was observed between CHD patients and controls. The mean serum NO concentration were decreased significantly and increased oxidized LDL was observed in CHD subjects when compared to controls. The T 786C polymorphism on eNOS genes was found to decrease the production of Nitric oxide and increase the oxidation of LDL thus increasing the risk of premature CHD in young subjects.

Keywords : Coronary Heart Disease, Endothelial Nitric Oxide Synthase, Gene Polymorphism; Nitric Oxide, Restricted fragment length polymerization

PP-31

Biochemical Assessment of Atherogenic Risk in PCOS Patients

Jaya Patel, Poornima Dey Sarkar, Rohit Manyal

Dept. of Biochemistry, MGM MC, Indore, M.P.
Email: jaya.patel1974@gmail.com

Objectives : 1. To find out the level of Serum Cholesterol, Triglygerides and HDL-C in study participants 2. To assess the cardiovascular aspect of atherogenic risk in PCOS patient and comparing it with non PCOS participants Methodology-The study was carried out in the Department of Biochemistry, with the assistance of Obstetric Gynecology Department, MGM Medical College Indore MP. In this study group consisted of 75 PCOS patients and control group consisted of 75 normal menstruating women. Study and control were matched by BMI, and age. PCOS patients were diagnosed by history and ultrasonographic finding. After taken informed consent from study participants attending OPD, in OBG Department, we took blood samples. Sample was analyzed in Biochemistry Lab, with clinical chemistry analyzer. Analysis was done for Serum Cholesterol, Triglygerides and HDL-C. Student "t" test was applied and results were expressed in terms of mean ± SD. p value less than 0.05 was considered statistically significant. Results – In the study we found highly significant difference in serum Triglycerides, Total Cholesterol, LDL-C levels, VLDL-C levels and HDL-C levels of study and control groups (P value

0.0001). Serum Triglycerides, total cholesterol, and LDL-C levels were raised and serum HDL-C levels were decreased in study group. Conclusions- PCOS patients are more prone for atherogenic lipid profile and cardiovascular diseases, so they should be screened for altered lipid profile in early stages for timely intervention and to avoid complications.

Keywords : Atherogenic Risk, Biochemical Assessment, Lipid Profile, PCOS

PP-32

Plasma Homocysteine A Better Risk Marker of Cardiovascular Disease among Pre and Post-Menopausal Women

Muruga S[1], Meera S[2]

[1]*Department of Biochemistry, Father Muller Medical College & hospital, Mangalore, Karnataka, India*
[2]*Chikkamaguluru Institute of Medical Sciences, Karnataka, India.*
Email: sirigeremax15@gmail.com; Ph No: 8884823428

Objective : Present study aimed to estimate and correlate the plasma homocysteine and lipid levels in pre and post-menopausal women. Methodology: The study was conducted in the Department of Biochemistry in association with Obstetrics and Gynaecology department of Mysuru Medical College. After screening for inclusion and exclusion criteria, 48 confirmed cases of postmenopausal women and 48 routinely menstruation premenopausal women were included in the study. Blood samples were taken from the individuals and processed in order to estimate the lipid profile and plasma homocysteine levels. Result: The BMI of postmenopausal women was substantially greater than that of premenopausal women. The mean values of lipid parameters did not differ significantly between the two groups. When compared to premenopausal women (10.52±2.62), the mean plasma homocysteine level (19.93±8.09) was considerably higher in postmenopausal women, and it also showed a positive correlation as age advanced. Conclusion: The homocysteine levels are much higher than lipid profile parameters, suggesting that homocysteine may be used as a sensitive marker of CVD in postmenopausal women.

Keywords : Homocysteine, Lipid Profile, Dyslipidemia, Cardiovascular disease, Premenopausal, Postmenopausal

PP-33

Biochemical Characterization of Acute Coronary Syndrome in the Patients with Diabetes Mellitus

Samundeeswari. P, Renuka.P,
V.E.Dhandapani, V.M.Vinodhini

Department of Biochemistry, SRM Medical College Hospital & Research Centre, Kattankulathur, Kancheepuram -603 203, Tamil Nadu, India

BACKGROUND : Acute Coronary Syndrome (ACS) refers to a spectrum of clinical presentation ranging from those for ST- segment elevation (STEMI) to non- ST-segment elevation myocardial infarction (NSTEMI) or in unstable angina (UA). It is associated with rupture of an atherosclerotic plaque and partial or complete thrombosis of the infarct-related artery. OBJECTIVES: To assess the correlation between lipid profiles and cardiac markers (CK- total, CK- MB) in ACS patients with and without Diabetes mellitus. METHODOLOGY: This study is a comparative cross-sectional study conducted in patient with cardiovascular disease with ACS recruited from the cardiology department of SRM MCH & RC. This study is conducted in 100 participants both controls ACS (without diabetes mellitus) and cases (with diabetes mellitus) in the age group of 25-70 years. Symptoms of ACS with definite ECG changes, suspected ACS with ST and non-ST elevated MI, unstable angina with electrocardiographic changes and elevated cardiac markers are included. These are analysed in Beckman Coulter AU480 auto analyzer and VITROS analyzer by using standard kit. HYPOTHESIS: ACS patients with Diabetes mellitus may have elevated levels of cardiac markers and adverse lipid profile.

Keywords : Acute coronary syndrome (ACS), Creatine Kinase (CK-Total), Creatine Kinase –MB (CK-MB), ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI), Unstable angina (UA).

PP-34

The Effect of Smoking on ACE and Its Relation with Severity of Cardiovascular Disease in Young Smokers

Dinesh Nath, Meera Shivasekar, V.M.Vinodhini

Department of Biochemistry, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulthur, Tamil Nadu, India, PIN: 603203

Smoking is considered as a major risk aspect of cardiovascular disease (CVD). Angiotensin-converting enzyme (ACE) is a key enzyme in the renin-angiotensin-aldosterone system, converting angiotensin I to the angiotensin II, regulates blood pressure and act as a vasoconstrictor may play a vital role in cardiovascular disease. So, the aim of this study is to find out the potential relationship between ACE and smoking and its relation with the severity of cardiovascular disease in young smokers. The study comprise 60 young smokers with CHD aged between 20 to 45 years who were attending in Cardiology OP, Medicine OP was selected for the study and 60 healthy non smoker were included as a control who were attending in MHC. Serum ACE, APO-E and hsCRP levels were measured by Enzyme-linked Immune Sorbent Assay (ELISA) and lipid profile was measured by enzymatic method. The mean serum ACE, APO-E and hsCRP levels were significantly ($p < 0.0001$) higher in smokers with CHD when compared to the controls. A significant positive correlation was found between ACE and APO-E (r- =0.3776), hsCRP (r=0.4614), TC (r =0.4858), TGL (r=0.3917), LDL (r=0.4689), TC/HDL (r=0.3225) and HDL/LDL (r=0.3638). The study also shows a significant positive correlation between serum ACE, APO-E and hsCRP levels with different age group, duration of smoking and number of smoking per day in young smokers. The study concludes that smoking produced a major effect on serum ACE, APO-E and hsCRP levels and is notably linked with the severity of coronary heart disease in young smokers.

Keywords : smoking, Anginotensin converting enzyme, cardiovascular disease, APO-E

PP-35

An Integrative Genomics and Interactomics Approach to Understand the Progression of Diabetic Nephropathy

Manoj Khokhar[1], Ashita Gadwal[1], Dipayan Roy[1], Sojit Tomo[2], Purvi Purohit[1]

[1]*Department of Biochemistry, All India Institute of Medical Sciences, Jodhpur, India*

[2]*Santosh Medical College Ghaziabad, Uttar Pradesh, India*

Background : Diabetic nephropathy (DN) is a significant cause of chronic kidney disease affects a large percentage of the population worldwide. Focal segmental glomerulosclerosis (FSGS) is a serious condition that can lead to renal- failure. Introduction: This study aimed to construct a molecular network to identify regulatory molecules and common MicroRNAs in DN that significantly affect disease pathophysiology and cause the FSGSlike condition. Method: Several keywords, including "Type 2 Diabetes mellitus", "T2DM", "Diabetic nephropathy", "DN", "Blood", and "Homo sapiens", were searched to identify the GEO, iLINCS dataset in the LINCS Data Portal and NCBI GEO database. Bioinformatics analyses performed included protein-protein interaction (PPI), functional enrichment analyses, and co-expression comparison and identification of target Micro RNAs. Result: We downloaded two gene expression profiles (GSE1009 and GSE142025) from the GEO and iLINCS database. Analyzed the dataSets with GEO2R (GEOquery and limma R packages) and GREIN. With a fold change cut-off of 0.8 and 1.25, we identified 84 and 8091 differential expressed genes (DEGs) in GSE1009 and GSE142025 respectively at adjusted P value <0.05. A total of 36 genes co-exist in the DEGs of the two data sets. WikiPathway analysis showed Primary FSGSpathway and four major interacting genes *PTPRO, CR1, NPHS1, MME* responsible for pathogenesis. Disease-Gene Association analysis showed proteinuria and glomerulonephritis. Gene Ontology analysis also yielded similar results. We found hsa-mir-16-5p (degree-18, betweenness-20303.12), hsa-mir-1-3p (degree-18, betweenness-24339.08), hsa-mir-27a-3p (degree-15, betweenness-10155.33), hsa-mir-124-3p (degree-15, betweenness-

15946.49), hsa-mir-107 (degree-15, betweenness-11825.72) were common target MicroRNAs of Common DEGs. We constructed a miRNA-mRNA regulatory network for the aforementioned five microRNAs. Conclusion: This integrative genomics study identified Primary FSGS pathway with four *PTPRO, CR1, NPHS1, MME* genes in pathogenesis and disease aggravation of DN. We identified the highest degree and betweenness hsa-mir-16-5p, hsa-mir-1-3p, hsa-mir-27a-3p, hsa-mir-124-3p, hsa-mir-107 are important miRNAs involved in the pathophysiology of FSGS and DN.

Keywords : Integrative genomics, Protein-protein interaction, focal segmental glomerulosclerosis

PP-36

Serum Lipoprotein(a) Level In Subjects With Ischemic Heart Disease Carrying Single Nucleotide Polymorphism Rs6415084 Of LPA Gene

Vineet Kulkarni[a], Sukanya Shetty[a], Anirban Chakraborty[b], Subramanyam[c], Prakash Patil[d] Roopa Bhandary[a]

[a]*Department of Biochemistry, KS Hegde Medical Academy,*
[b]*Nitte University Center for Science Education and Research,*
[c]*Department of Cardiology, Justice KS Hegde Charitable Hospital, KSHEMA,*
[d]*Central Research Laboratory, KS Hegde Medical Academy,*
Nitte (Deemed to be University), Deralakatte, Mangaluru, Karnataka – 575018, India
Email: vineetkulkarni2505@gmail.com

Objective : This cross sectional study was aimed to estimate serum lipoprotein(a) level among subjects with Ischemic Heart disease carrying SNP rs 6415084 and to find correlation between serum lipoprotein(a) level and severity of Ischemic heart disease(IHD) determined by SYNTAX score. Methodology – Total of 100 subjects with angiographically proven IHD were recruited for this cross sectional study. Based on SYNTAX score subjects were classified into mild(<22)(N=76) and severe (>22)(N=24). Serum Lipoprotein(a) level was estimated by using Immunoturbidometric method. Severity of Ischemic Heart disease was determined by SYNTAX score. SNP genotyping assay among IHD subjects was performed by Real time PCR method by using Taqman genotyping assay kit. Results- The Median Lp(a) level of all subjects was 15.2mg/dL (7.3-26.7) Severe subjects had higher Median Lp(a) level(18.9mg/dL (12.3-24.4) compared to mild subjects (13.7mg/dL(6.6-18.6). Out of 100 study subjects, 38 subjects had C/T genotype, 17 had CC genotype 15 had TT genotype and 30 subjects did not carry any genotype (undetermined). Subjects carrying TT genotype had a slightly higher median Lp(a) level[22.6mg/dL(11.1-45.3)] compared to subjects carrying CC [19.4mg/dL(17-31.2)]and CT genotype[20.05(11.3-28.9)]. Conclusion- Severe subjects had higher Lp(a) level compared to mild subjects. There was no significant correlation between Lp(a) and SYNTAX score among severe group. Positive correlation between Lp(a) and SYNTAX score was observed only among female mild group. Subjects carrying homozygous allele(TT) had slightly higher median Lp(a) level compared to subjects carrying heterozygous(CT) population.

Keywords: Lipoprotein(a), Coronary artery disease, Single nucleotide polymorphism, SYNTAX score

PP-37

Genetic Analysis of 1p13.3 Locus and Circulating Sortilin Levels as Biomarkers of Coronary Artery Disease in Indian Patients

Ankita Bane[1], Minal Paradkar[1, 2], Amruta Pathare[1], Chandrashekhar K. Ponde[3], Rajesh M. Rajani[3], Sudhir Pillai[3], Tester F. Ashavaid[1,2]

[1]*Research Laboratories,* [2]*Biochemistry Section, Department of Laboratory Medicine,* [3]*Department of Cardiology,P. D. Hinduja Hospital and MRC*
Email: ankitasbane@gmail.com
dr_tashavaid@hindujahospital.com

Objectives : Genetic variants in 1p13.3 chromosomal locus containing CELSR2-PSRC1-SORT1 are strongly

associated with lipid levels, hepatic-mRNA levels of nearby genes and coronary artery disease (CAD). However, there is limited evidence on the clinical utility of these variants and circulating sortilin as potential biomarkers for CAD. We analyzed the association of 3 SNPs in the 1p13.3 locus and circulating sortilin levels with lipid levels, candidate gene expression and CAD in a representative Indian cohort. Methodology – 1p13.3 SNPs were genotyped by ARMS-PCR in 112 CAD patients and 112 controls. Plasma lipid and circulating sortilin levels were estimated. mRNA levels of CELSR2, PSRC1 and SORT1 genes were determined by qPCR in a subset of 50 cases and 50 controls. Results – Minor alleles of rs646776, rs599839 and rs12740374 were associated with reduced LDL-C (92mg/dl vs 85.5mg/dl; p=0.0428) and VLDL levels(23 mg/dl vs 20mg/dl; p-0.0424), but not with risk of CAD; the mutant allele was significantly associated with type-2 diabetes mellitus (p=0.0436). Sortilin levels were elevated in cases (5.013ng/ml; IQR:4.159-6.929) compared to controls (2.726ng/ml; IQR:0.893-4.214, p<0.0001). ROC analysis suggested that sortilin levels could identify the presence of CAD in our population (AUC=0.798, p<0.001). Gene expression analysis showed that PSRC1 gene expression was lower in cases vs controls (9.39±8.19 vs 10.8±10.65, p=0.024), however, mRNA levels of CELSR2 and SORT1 were not significant. Conclusions – No association was observed between 1p13.3 genotypes, lipid levels and mRNA levels of the 3 studied genes. Circulating sortilin was significantly associated with the presence of diabetes mellitus in patients with CAD. Validation in a larger cohort is necessary to confirm the true clinical impact.

Keywords : sortilin, 1p13, coronary artery disease, gene expression

PP-38

Study of Serum Neutrophil Gelatinase Associated Lipocalin Levels in Acute Coronary Syndrome and Its Correlation with Severity and High-Sensitive C Reactive Protein

Sunanda Dalai, Nirupama Devi, Anuva Mishra, Rasmita Kumari Padhy

Dept. of Biochemistry, MKCG Medical College and Hospital
Correspondence email – sunu.mkcg@gmail.com

Objectives : 1) To estimate the serum levels of neutrophil gelatinase associated lipocalin (NGAL) in patients with acute coronary syndromes (ACS). 2) To determine the proportion of patients with elevated serum NGAL. 3) Correlation of serum NGAL with serum high sensitive C reactive protein (hsCRP) and SYNTAX score in such patients. Methods: Thirty-two cases with acute coronary syndromes and 32 angio negative controls were included in the study. Apart from the routine work up and management, all patients underwent determination of serum NGAL and serum hsCRP levels at admission. SYNTAX score was calculated from the angiographic studies done. Results: Serum NGAL (140.72 + 52.69) ng/ml levels were detectably elevated in 93% of patients with ACS without any renal failure, hepatic failure or sepsis. Serum NGAL levels positively correlated with serum hsCRP and the SYNTAX scores ($p < 0.001$). Conclusion: This is a case-control study that shows serum NGAL is significantly high in ACS patients when compared to controls. Also it correlates with the severity of the disease, so it may be considered as a possible new risk marker in ACS.

Keywords : Neutrophil gelatinase associated lipocalin, acute coronary syndrome, SYNTAX score, high sensitive C-reactive protein.

PP-39

Evaluating Prognostic Role of Cardiac Biomarkers in COVID-19 Patients

Swarn Surbhi, P.D. Sarkar,
Rajeev Lohokare, Deepasha Shahi

Department of Biochemistry, M.G.M. Medical College, Indore, MP
Corresponding Author : swarnsurabhi@gmail.com

INTRODUCTION : The COVID-19 pandemic has created havoc in India with total deaths crossing 0.4 million. Cardiac biomarkers are found to be associated with poor outcome in COVID-19 patients having concomitant cardiac diseases. But the prognostic value of cardiac biomarkers in cardiac and non-cardiac patients following COVID-19 disease was not thoroughly investigated. This study was designed to investigate prognostic role of cardiac biomarkers in COVID-19 patients with cardiac disease. METHODS: This retrospective study was conducted in the Department of Clinical Biochemistry, M.G.M. Medical college & M. Y. hospital, Indore. Four cardiac biomarkers, Trop-I, Myo, CK-MB, and BNP were considered for evaluation. Laboratory confirmed COVID-19 patients were divided in two groups, with and without concomitant cardiac disease. The differences of cardiac biomarker levels between the groups were compared using the Wilcoxon signed-ranks test. RESULTS: Out-off 632 admitted patients, 512 were found evaluable. Of 512 eligible patients, 58 (11.3 %) had a history of cardiac disease. A total of 31 (6.0%) all-cause death occurred during the follow-up, 8 (13.8%) deaths occurred in the cardiac disease group and 23 (5.0%) occurred in the non-cardiac group. For cardiac patients, the AUC of Trop-I, CK-MB, Myo, and BNP was found 0.660, 0.512, 0.753 and 0.712, respectively. Myo, had the highest prognostic value, followed by BNP. CONCLUSION: Increased levels of Myo and BNP have significant prognostic relevance. Our study can help to understand the prognosis of cardiac patients with COVID-19 disease. However, further study is needed.

Keywords : COVID-19, Myo, BNP, CK-MB, TROP-I

PP-40

Effect of BPB on Bacterial Growth

Samiksha Jain*, Sumanpreet Kaur,
Sonal Sangwan, Sheemona Chowdhary,
Deepak Kumar, Rajasri Bhattacharyya,
Dibyajyoti Banerjee

Postgraduate institute of medical education and research (PGIMER), Chandigarh 160012
**Corresponding author: samikshaj1310@gmail.com*

Introduction : Bisphenol B (BPB) is a plastic leak out. Its adverse effects are well known. However, its effect on the gut microbiome is incompletely understood. Objective: To study the effect of BPB on the growth of *E.coli* MTCC 1687. Methods: In silico and in-vitro studies are employed to known the effect of BPB on the growth of E.coli MTCC 1687. Result: BPB is found to inhibit the growth of the studied bacteria. Conclusion: E.coli MTCC 1687 is collected from human feces. So, we believe that the effect of BPB in the human gut microbiome is worth investigating.

Keywords : Bisphenol B , Microbiome, gut health, E.coli

PP-41

Oxidative Stress Markers and Pro-Inflammatory Cytokine Levels in Occupationally Lead Exposed Workers

Taru Goya1[1], Prasenjit Mitra[2],
Shailja Sharma[1], Praveen Sharma[1]
Department of Biochemistry,

[1]All India Institute of Medical Sciences, Jodhpur
[2]Post Graduate Institute of Medical Education & Research, Chandigarh
Email: tarugoyal123@gmail.com

Background : Lead (Pb) exposure in environmental and occupational settings is a major public health concern. Pb exposure is associated with production of free radicle

and reactive oxygen species. The aim of the present study is to evaluate the effect of occupational exposure to Pb on oxidative stress and pro-inflammatory biomarkers in the workers. Methods: 100 occupationally exposed individuals working in metal handicraft industry and welding industry were recruited from industrial area of Jodhpur, Rajasthan. Blood Pb levels were estimated using atomic absorption spectroscopy. Serum Total Antioxidant Capacity (TAC), Catalase (CAT), Superoxide Dismutase (SOD), and Malondialdehyde (MDA) levels were measured by colorimetric method to assess oxidative status and serum IL-6 and TNF-α were measured by ELISA to assess inflammatory status. Results: The median Pb levels in the study population were 4.80µg/dL, with welders having significantly higher Pb levels than metal handicraft workers. Among the oxidative stress markers, TAC and CAT were significantly lower, while MDA was significantly higher in subjects with high Pb levels. The Pb levels showed a significant negative and positive correlation with TAC and MDA, respectively. IL- 6 and TNF-α did not show significant difference between the study groups, but both had an inverse correlation with antioxidant enzymes. Conclusion: Occupational exposure to even low levels of Pb may result in oxidative stress in workers primarily via decrease in antioxidant enzymes and increasing lipid peroxidation. Increased oxidative stress in turn may result in immune cell activation which may result in increased concentration of pro-inflammatory cytokine in the exposed workers

Keywords : Lead, Oxidative stress, cytokines, India

PP-42

A Study to Assess the Presence of Heavy Metals in Urine and Hair of Patients Diagnosed With Attention Deficit Hyperactivity Disorder In Eastern India

Saurav Nayak[1]*, Suchanda Sahu[1],
Joseph John[2], Suravi Patra[3]

[1]Department of Biochemistry, [2]Department of Paediatrics, [3]Department of Psychiatry, AIIMS Bhubaneswar. email: drsauravn@gmail.com

Objectives : 1. To estimate levels of heavy metals in urine and hair in the study population 2. To evaluate the association between excretion of heavy metals in urine, and accumulation in hair, with ADHD. Methods: 24 children diagnosed with ADHD were taken as cases and matched with 24 healthy controls. Hair and urine samples were analysed for lead, cadmium, zinc, nickel, copper, and arsenic. The samples were collected in sterile containers following standardised protocols. Acid digestion of hair samples and extraction of heavy metals from urine were performed. The levels of heavy metals were measured using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). Results: The levels of lead ($p = 0.004$), cadmium ($p = 0.020$), nickel ($p = 0.016$) and copper ($p = 0.013$) of hair samples were higher in the cases while Zinc levels were lower in the cases ($p < 0.001$) compared to controls. In urine too the heavy metals except zinc were significantly higher, lead ($p = 0.003$), cadmium ($p < 0.001$), zinc ($p < 0.001$), nickel ($p < 0.001$) and copper ($p = 0.006$) while. Zinc levels were lower in cases ($p<0.001$) than controls. The zinc to copper ratio was lower in cases ($p < 0.001$ in both hair and urine). Conclusion: The heavy metals level in hair and urine are significantly higher than controls in ADHD.

Keywords : heavy metals, urine, hair, icpooes

PP-43

Radioactive Dose Deposition upon Thoron Inhalation and Subsequent Biological Alterations in Lung Tissues

Debajit Chaudhury[1]*, Utsav Sen[1], Nagesh N. Bhat[2], Bijay K. Sahoo[2], Sudheer Shenoy P.[1], Bipasha Bose[1]

[1]Yenepoya Research Centre, Yenepoya (Deemed to be University), Mangalore, India-575018.

[2]Radiological Physics and Advisory Division, Bhabha Atomic Research Centre, Trombay, Mumbai, India-400085.
**email ID: chaudhury.debajit@gmail.com*

Aim and Objectives : To study the effect of different dose ranges of thoron inhalation on the entire respiratory tract along with gross molecular changes associated with it. Materials and Methods: We have generated a range of high background radiation areas (HBRAs) ~2.5-25 mSv in our laboratory using the the natural thorium (thorium oxalate) bed laid inside a 1m3 stainless steel chamber with air flushing ports. BALB/c mice were exposed to such range of HBR radiation from day 1 to day 10. Total radioactive dose deposition in the airway tissues are estimated by high resolution gamma ray spectroscopy

using high purity germanium (HPGe) radiation detectors along with reactive oxygen species detection. The subsequent cellular and molecular changes were assessed as well. Results: Highest total radioactive dose in the total airway tissue was calculated to be 343.20±17 mSv. There was a dose dependent increase in the alveolar hyperplasia along with hemosiderin deposition in the respiratory tissue. Specifically, the manifestations were DNA damage and inflammatory response in dose- and time-dependent manners. In detail, it caused the antioxidative dysfunction and oxidative stress as determined by the abnormal levels of malondialdehyde. An initiation in respiratory fibrosis was also observed at the highest dose deposition. Conclusion: Thoron daughter progenies Lead212, Thallium208 and Bismuth212 are responsible for delivering the dose in the tissue which are responsible for the gross and molecular changes in the respiratory tissue.

Keywords : HBRAs, thoron, alpha rays, ROS, oxidative stress, lung damage

PP-44

Effect of BPA on Bacterial Growth

Sumanpreet Kaur*, Samiksha Jain,
Sonal Sangwan, Sheemona Chowdhary,
Deepak Kumar, Rajasri Bhattacharyya,
Dibyajyoti Banerjee

Post graduate institute of Medical Education and Research (PGIMER), Chandigarh 160012
** Corresponding author: sumankamboj436@gmail.com*

Introduction : Bisphenol A (BPA) is a plastic leak out. Its adverse effects are well known. However, its effect on the gut microbiome is incompletely understood. Objective: To study the effect of BPA on the growth of *E. coli* MTCC 1687. Methods: In silico and in-vitro studies are employed to known the effect of BPA on the growth of E. coli MTCC 1687 Result: BPA is found to inhibit the growth of the studied bacteria. Conclusion: E. coli MTCC 1687 is collected from human faeces. So, we believe that the effect of BPA in the human gut microbiome is worth investigating.

Keywords : Bisphenol A, *E coli*, Microbiome

PP-45

Association of Blood Lead and Serum Serotonin Levels in Indian Children

Malavika Lingeswaran[1], Prasenjit Mitra[2],
Taru Goyal[3], Shailja Sharma[4], Praveen Sharma[4]

[1]*Department of Biochemistry, ESIC Medical College and PGIMSR, KK Nagar, Chennai*

[2]*Department of Biochemistry,* [3]*Department of Pediatrics, PGIMER, Chandigarh*

[4]*Department of Biochemistry, AIIMS, Jodhpur*
Email: drmalavikal@gmail.com

Objectives : Childhood lead (Pb) toxicity is major public health concern as it is associated with irreversible adverse behavioural and intellectual changes in children. Pathogenesis of childhood Pb toxicity is unclear and previous studies suggest an imbalance in neurotransmitter pathways as an underlying cause. Present study was aimed to assess the association of serum serotonin levels and blood lead levels in school going children. Methodology: School-going children aged 9–15 years (n=72) were included in the study. The blood lead level (BLL) was measured using graphite furnace atomic absorption spectrophotometry and serum serotonin levels were measured by ELISA. Shapiro wilk test was used to assess normality of data. Since data was non-parametric in distribution, Spearman's correlation test and Mann whiney U test were used to analyze the data. Results: Median BLL of the study population was 4.99µg/dL. BLL had significant negative association with serum serotonin levels ($r=-0.41$, $P<0.001$). Further when the subjects were stratified into High and Low BLL groups based on median BLL, Serum serotonin levels were significantly lower in High BLL group (Serum serotonin in High BLL group = 123.3 ng/ml, Low BLL group = 303.1 ng/ml $P<0.001$). Conclusion: Pb toxicity may induce an imbalance in serotonergic system, thereby resulting in low serum serotonin levels in children exposed to Pb. Imbalance in serotonergic pathway may be a crucial factor mediating neurotoxic effects of Pb in children

Keywords : Children, Lead, Neurotoxicity, India

PP-46

Evaluating Laboratory Parameters for Diagnostic Accuracy in COVID 19 Patients in a Tertiary Care Government Hospital in Greater Noida, U.P

Mamata Padhy[1], Ajay Kumar Garg[2], Hariom Kumar Solanki[3], Ravoori Saideswar Rao[1], Manisha Singh[1], Vivek Gupta[4]

[1]Department of Biochemistry, [2]Department of Medicine, [3]Department of Community Medicine, [4]Department of Pathology, Government Institute of Medical Sciences, Greater Noida, UP.
Email ID: mamtajan@gmail.com

Objective : In this study, we have assessed the hematological characteristics of the patients. This study aimed to evaluate the accuracy of laboratory parameters in predicting cases with positive RT-PCR for COVID-19. Methodology: This was a cross-sectional study that included 32 RTPCR +ve and 64 RTPCR -ve cases over a period of 5 weeks. The blood samples were collected from symptomatic patients who presented to cough OPD. On the day of swab sampling, blood sampling was done for each participant. All tests were performed in an appropriate autoanalyzer after complying with internal quality control. Results: The mean CT value of RT-PCR test was found to be 22.7, while mean PCT value was 0.3 ng/ml. The mean ferritin value came out to be 133.5 ng/ml and mean D-dimer values calculated to be just 1.3 mg/L. The mean LDH and CRP levels were 340.4 IU/L and 12.6 mg/L respectively. The sensitivity and specificity for procalcitonin analysis among these patients were 97% with CI (93.8-100) followed by serum ferritin with 82%, CI (70-94) and CRP levels were having just 77.3%, CI (61.2-93.4). Conclusion: In the current study, the AUC of procalcitonin and serum ferritin were above 0.80; thus, they are effective and have very good predictive value for predicting COVID-19. It seems that these blood laboratory parameters could be used in screening cases with positive RT-PCR for COVID-19. However, serum LDH, D Dimer, and vitamin D levels or liver function tests, renal function tests remain insignificantly linked with covid positivity rate in this study.

Keywords : COVID-19, serum LDH, Procalcitonin, RT-PCR.

PP-47

Comparative Analysis of Biochemical Parameters in Moderate & Severe Patients Infected with COVID-19

Komal Meshram[1], ArunTadas[2]

Department of Biochemistry, Indira Gandhi Government Medical College & Hospital, Nagpur, Maharashtra, India
E-mail: komalmeshram0894@gmail.com

Background/Objectives : Corona virus disease 2019(COVID19) pandemic has caught the world into pronounced health crisis as number of patients is dramatically increasing worldwide. COVID19 is caused by severe acute respiratory syndrome corona virus 2 (SARSCoV2) which mainly infects respiratory system but can damage other systems also. So, its early diagnosis is very necessary. Biochemical Parameters can effectively diagnose COVID19 earlier. This study is to analyze alterations in biochemical parameters in COVID19 patients of our region as there is scarcity of COVID19 related biochemical data of our region & to compare them according to disease severity. Methodology: This study involved 112 COVID19 positive patients admitted between 01/09/2020 & 30/11/2020 at IGGMC, Nagpur. Patients were categorized on the basis of ICMR guidelines into two groups i.e. moderate(n=56) & severe(n=56) each between 18 & 80 years of age. Blood samples were processed in ERBA-XL-640 autoanalyzer for estimation of serum levels of C-reactive protein(CRP), Ferritin, Lactate Dehydrogenase (LDH), Creatinine, Urea, Aspartate Transaminase (AST), Alanine Transaminase (ALT), Alkaline Phosphatase (ALP),Total Proteins (TP), Albumin. Results were compared between these two groups & evaluated using independent samples t-test. Result: Severely ill patients had significantly higher levels of LDH (p=0.0001), CRP (p=0.0001), Ferritin (p=0.0001), Creatinine (p=0.0001), Urea (p=0.007), AST (p=0.02) & ALT (p=0.02) as compared to moderate patients. No significant difference was observed in values of TP (p=0.4), Albumin (p=0.6), ALP (p=0.7) between both groups. Conclusion: Biochemical investigations of COVID19 patients are simple, cost-effective & rapid marker which helps in early identification of critically ill patients & monitoring of disease progression aiming to improve recovery & reduce mortality of COVID19 patients.

Keywords : COVID19, Biochemical Parameters, LDH, FERRITIN, CRP, ALT, AST, Urea, Creatinine

PP-48

Spectrum of Arterial Blood Gas Alterations in COVID-19 Patients Admitted In ICU With Multi-Organ Involvement

V. Pearlin Bala, M. Ganesh

Sri Ram Chandra Medical College, TN
E-mail : m0420002@sriramachandra.edu.in

AIM : To assess the arterial blood gas alterations in COVID-19 patients admitted in ICU with multi-organ involvement. METHODS: Systematic research of articles assessing the arterial blood gas alterations was performed with NCBI as the search engine during the year 2020-2021. Baseline arterial blood gas data were taken. A pH of < 7.35 was categorized as acidaemia & pH of >7.45 was categorized as alkalemia. Patients with multiple organ involvement such as liver, kidney, muscle were considered in this study. All types of acid – base disorders were seen in these review of journals. RESULTS: ABG analysis revealed low arterial partial pressure of oxygen, altered pH, pCO2 & bicarbonate levels. Most of the patients had low oxygen saturation(<90%) leading to acute respiratory distress syndrome. 8 articles revealed arterial blood gas alterations pertaining to acid-base disorders which includes original studies & a case report. Respiratory alkalosis (3 studies), metabolic acidosis (3 studies) followed by metabolic alkalosis (2 studies). Majority of patients had comorbid conditions like diabetes, hypertension, cardiovascular disease, cerebrovascular disease. CONCLUSION: Most common acid – base disorder that occurred in patients were respiratory alkalosis with compensatory metabolic acidosis. A higher proportion of females were affected with respiratory alkalosis. Equal prevalence of metabolic alkalosis condition was also noted in COVID-19 patients. Primary alteration in COVID patients resulting in death was metabolic acidosis which could be due to inadequate respiratory compensation due to primary involvement of lungs by COVID-19 infection, increased lactate levels due to hypoxia. Hence it's advisable to screen for acid-base disorders in all COVID-19 patients irrespective of severity of disease.

Keywords : COVID-19, ABG, acid-base disorder,

PP-49

Evaluation of Maternal Serum Leptin levels in Gestational Diabetes mellitus and Healthy Pregnant Women in Central India

Vibha Khare, Purnima Dey Sarkar, Sangeeta Panerri, Rajeev Lohokare, Bhavana Tiwari

Department of Biochemistry, MGM Medical College, Indore, MP

Objective : Pregnancy is a physiological condition associated with insulin resistance and marked biochemical changes in body. Women with gestational diabetes mellitus shows defect in insulin secretion might be mediated by increases in hormones. Leptin an adipocytokine is involved in weight regulation and metabolism and also affect the maternal and fetal outcome. Aim of our study was to measure the serum leptin levels in gestational diabetes mellitus patient and normal healthy pregnant women. Material and methods – The cross sectional study was conducted in the Department of Biochemistry MGM Medical college Indore after Ethical committee approval. 50 healthy pregnant women and 50 newly diagnosed gestational diabetes mellitus patients with age and gestation age matched were taken after informed consent. BMI and fasting blood sample for serum leptin and lipid profile were done in both the groups. Results – Serum leptin level was significantly higher in women with GDM compared with the healthy pregnant women. In GDM Patients mean serum leptin was 32.01 ± 3.53 ng /ml while in control group it was 22.62 ± 2.16 ng/ml. Conclusion - Our study showed that serum leptin level is significantly higher in GDM patients. Detection of serum leptin levels helps in early diagnosis of GDM and associated complications that will help in better fetomaternal outcome.

Keywords : Gestational Diabetes Mellitus, Leptin, BMI, Insulin resistance, GDM

PP-50

MicroRNA-181b-5p as a Potential Biomarker in Obese Type 2 Diabetes mellitus

Dipayan Roy,[1] Anupama Modi,[1] Manoj Khokhar,[1] Ravindra Shukla,[2] Praveen Sharma[1], Purvi Purohit[1]

[1]*Department of Biochemistry,*
[2]*Department of Endocrinology and Metabolism,*
AIIMS, Jodhpur
Email: d.roy12092009@gmail.com

Objectives : The diagnosis of type 2 diabetes (T2DM) at early stages and prediction of the high-risk population require identifying markers sensitive enough to be detected at early stages of disease. The current study aimed to analyse the circulating miR-181b-5p as a potential biomarker in obese pre-diabetics and T2DM. Methodology: The study included 30 type 2 diabetics, 15 pre-diabetics and 15 age and gender matched healthy controls. All the subjects were free from any associated co-morbidities. The fasting venous blood sample of the study participants was analysed for blood sugar (FBS), insulin, insulin resistance, lipid profile, HbA1c, and miR-181b-5p. Fold change expression was done using RNU6. Receiver operator characteristic curve (ROC) was plotted for miR-81b-5p taking HbA1c as the gold standard to determine its strength as a potential biomarker. Results: The study reports of a significant difference across the three groups healthy controls, pre-diabetes and T2DM for FBS ($p<0.01$); insulin ($p<0.01$); HOMA-IR ($p<0.01$); HbA1c ($p<0.01$); total cholesterol ($p<0.01$) and miR-181b-5p ($p=0.01$). Fold change expression of miR-181b-5p was 6.24 for pre-diabetes and 5.83 for T2DM. The analysis of ROC curve for miR-181b-5p in pre-diabetes and T2DM showed a sensitivity of 62.5% and 78.3%, respectively, with an AUC of 0.80 for the latter.

Conclusion : The miR-181b-5p- can be a potential biomarker in obese T2DM patients.

PP-51

Correlation of Serum Cystatin C and Thyroid hormones in Hypothyroid patients

Suman Debnath, Tina Das, Davina Hijam, O.Prabita Devi, Ibetombi Devi

Dept. Of Biochemistry, Regional Institute of Medical Sciences, Imphal
Email: dr.tinadas@gmail.com

Thyroid disorders are the most common endocrine problems encountered in our laboratory. Cystatin C, a potent cysteine protease inhibitor, is considered as a novel marker for assessing glomerular filtration rate (GFR) and claimed to be superior to serum creatinine. Thyroid dysfunction have been demonstrated to have an impact on the serum concentrations of cystatin C. Compared with the euthyroid state, serum cystatin C concentrations are lower in the hypothyroid state. This study was done to estimate and compare the level of serum cystatin C in patients suffering from hypothyroidism as well as in normal healthy individuals, to find whether serum cystatin C and hypothyroidism is correlated and can serum cystatin C be used as a marker of peripheral thyroid hormone effect. This was a case control study, carried out in 50 hypothyroid patients presenting in different departments of Regional Institute of Medical Sciences, Imphal from Oct 2017 to Oct 2019. Another 50 patients were taken as healthy controls. Serum Cystatin C was measured by ELISA and serum TSH, T3 & T4 was measured by chemiluminescence enzyme immunoassay. The serum cystatin C level was low (0.84±0.42mg/L) in hypothyroid patients as compared to controls (1.22±0.65mg/L). The level of TSH is negatively correlated whereas; levels of T3 & T4 are positively correlated with serum cystatin C level, both of which are statistically significant. This study concluded that the thyroid hormones influence the production of cystatin C and cystatin C is decreased in hypothyroid patients.

Keywords : Cystatin C, Hypothyroidism, Chemiluminescence, ELISA

PP-52

Serum Uric Acid Levels in Chronic Obstructive Pulmonary Disease (COPD) Patients

Malla Rupesh Kumar, R. C. Gupta, Madhuri Gupta

National Institute of Medical Sciences & Research, Jaipur
Email: madhurigupta01@gmail.com

Background : COPD is a progressive irreversible inflammatory disease that affects the lungs and reduces the airflow. Serum uric acid is an end product of purines metabolism, and is a major extra cellular antioxidant present in the respiratory tract. However, the role of serum Uric Acid (sUA) in COPD subjects has been found both confounding and inconclusive. Objectives: To determine serum uric acid levels in different stages of COPD and to compare it with healthy controls. Material and Methods: sUA levels were measured in 85 stable COPD subjects (40 to 60 years) and 85 age and sex matched healthy control subjects. Results: COPD cases had significantly higher level of serum uric acid levelscompared to control subjects (5.95±1.55; 3.63±0.48 mg/dl, respectively).Comparison of sUA with severity of COPD stages was observed (as per GOLD criteria) for mild, moderate, severe, and very severe (4.7±0.60 mg/dl, 6.5±0.80 mg/dl, 8.4±0.45 mg/dl & 9.3±014 mg/dl, respectively). The ROC analysis indicates that cut off value of serum uric acid is 4.3 mg/dl in COPD, with sensitivity of 88.2% and specificity of 94.1%. Conclusion: This study provides the possible evidence that serum uric acid may be useful in assessing disease severity and progression in COPD patients.

Keywords : COPD, GOLD Criteria, ROC curve, Serum Uric acid

PP-53

Association of Age and Gender on HbA1c Levels in Individuals without Diabetes- A Study to Prevent Misdiagnosis during Diabetic Treatment

S.Janani Iswarya, Arun jose Nellickal

Department of Clinical Biochemistry, Christian Medical College, Vellore.

BACKGROUND : HbA1c or glycated hemoglobin is globally accepted as a diagnostic marker for diabetes mellitus. Various factors influence the measurement of HbA1c levels such as age and sex and it is well known that increased HbA1C levels have been associated with increase in age in diabetics. However, only very few studies have supported the impact of these factors in nondiabetic individuals. Hence this study was carried out to find the association of HbA1c levels with age and gender in individuals without diabetes. AIM: To study the association between HbA1C levels and factors such as age and sex in individuals without diabetes. METHOD: HbA1C values of both male and female non diabetic individuals were enrolled for this study. HbA1c levels were measured by using ion exchange HPLC method (Biorad D 100 Analyzer). RESULTS: A strong relationship between HbA1C levels and age in patients without diabetes was noted. A significant increase in HbA1c levels were also observed in male group when compared to the female group. CONCLUSION: This study helps us to consider the confounding factors like age and sex while selecting HbA1C as a criterion for diabetes screening. And it also signifies the importance of deriving age related reference values for HbA1C to improve the diagnostic efficiency in the elderly non diabetic individuals.

Keywords : HbA1C, Age, Sex,

PP-54

Evaluation of Serum Levels of Zinc and Copper in Treatment Naive Tuberculosis Patients of Central India

Modi Priyank*, Mittal Rishabh*,
S N Krishnagopal, Singh Snigdha,
Ahirwar Sonu, Chaurasia Nidhi,
Tripathi Ajay**, Shukla K Arvind**,
Khurana Alkesh^, Kotnis Ashwin^^

*** Indian Institute of Soil Sciences Bhopal*
**Department of Biochemistry, ^Department of Pulmonary Medicine, AIIMS, Bhopal*
Email: ashwin.biochemistry@aiimsbhopal.edu.in

Objective : Tuberculosis (TB) is a curable infectious disease, prevalent in India, causing significant morbidity and preventable deaths worldwide. Concomitant malnutrition in TB patients is an under addressed issue in TB research. Zinc and Copper are the most important micronutrients for immunological defense which get depleted from body stores in tuberculosis. Methods: A cross-sectional, ethics approved, ICMR-STS study

comprising of 43 consenting active TB patients with smear positive microscopy test for Acid Fast Bacillus or a positive Cartridge Based Nucleic Acid Amplification Test with compatible clinical history was accrued from the Department of Pulmonary medicine, AIIMS Bhopal. Concomitantly, 44 matched, unrelated healthy controls were enrolled from the hospital premises. 4 ml of venous blood was collected in metal free vacutainers from the participants to obtain serum for quantitatively estimated for Zn and Cu by Atomic Absorption Spectrometry (AAS). Results: The mean serum Zinc and Copper levels of patients presenting pulmonary tuberculosis were 59.92µg/dl and 161.48µg/dl respectively. The mean serum Zinc and Copper levels of enrolled age, gender and economic status of apparently healthy controls were 80.91µg/dl and 102.74 µg/dl respectively. Conclusion: Zinc supplementation through diet and/or medications is advised for patients with active Tuberculosis in Central India and a clinical trial to study its effect on prognosis is warranted

Keywords : Tuberculosis, Zinc, Copper, Nutrition and Tuberculosis

PP-55

Comparison of New and Old Formulae for LDL-Cholesterol Estimation in Indian Subjects at a Higher Range of Triglyceride

Shrimanjunath Sankanagoudar,
Sojit Tomo, Praveen Sharma

Department of Biochemistry, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India 342005.
Email: doc_manjunath@yahoo.co.in

Objectives : LDL Cholesterol (LDL-C) is one of the important risk factors for atherosclerotic cardiovascular disease. Reducing LDL-C levels has been proposed by various guidelines for mitigating the risk of atherosclerotic cardiovascular disease. Martin's and Sampson's formula are the newly derived formulae proposed to replace the older calculation methods. We aimed to assess the newer formulae viz. Martin's and Sampson's formula, in comparison with older formulae, in calculating LDL-C in patients with triglyceride (TG) more than 250 mg/dL. Methodology: The analytical cross-sectional study collected lipid profile data from 4096 patients retrospectively, of which 422 samples with TG more than 250 mg/dL were selected and stratified based on the TG levels into four groups. Results: A significant difference was observed in calculated LDL-C in all the groups for the formulae Friedewald's, Ahmadi's, Anandaraja's, Martin Hopkins's and Sampson's except Cordova. Our study demonstrated the Cordova formula to calculate LDL-C in better approximation with direct estimation than any other formula in patients with TG levels between 350 - 1000 mg/dL. Conclusion: Thus, the Cordova formula, which is the simplest of all, was poised to be superior to the newer Martin Hopkins' and Sampson's formulae at higher ranges of TG and may be applied in clinical practice to calculate LDL Cholesterol.

Keywords : Martin Hopkins, Sampson, Cordova, Friedewald, LDL Cholesterol, Triglyceride

PP-56

Increased C-Reactive Protein associates with Disease Activity and Quality of Life in patients with Rheumatoid Arthritis from a Tertiary Care Hospital in Central India.

Singh S, Ingle V*, Kotnis A^

Department of Biochemistry,
**Department of Medicine, AIIMS Bhopal*
ashwin.biochemistry@aiimsbhopal.edu.in

Objective : Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease affecting the synovial joints, leading to severe disability, affecting ~ 1% of the world population. C- Reactive protein (CRP), an acute phase reactant, marker of inflammation is associated with Clinical Disease Activity Index (CDAI) and quality of life/disability of the patient (scored by Health Assessment Questionnaire -HAQ) of RA. Methods: This was a cross-sectional, ethics approved study on 100 consenting RA patients visiting Medicine OPD, AIIMS, Bhopal without medication for the past 2 months. CRP levels were available for 30 patients at the time of admission. CRP was analysed on Beckman Coulter AU-680. The CDAI score was calculated by analyzing the tender and swollen joints, Patient's Disease Global Assessment, and Evaluator Disease Global Assessment. The HAQ score was calculated using Community Oriented Program for Control of Rheumatic Disorders. Results: The mean serum CRP levels of patients presenting with moderate and severe disease activity were 18.27mg/l and 30.18 mg/l respectively. The patients with mild, moderate, severe and very severely affected quality of life had mean serum CRP levels of

19.30 mg/l, 29.12mg/l, 30.77 mg/l and 42.20 mg/l respectively. Conclusion: The CDAI and HAQ score has positive association with the serum CRP levels of the Rheumatoid arthritis patients of Tertiary Care hospital.

Keywords : Rheumatoid arthritis, C-reactive protein, CDAI, HAQ

PP-57

Association of Selected Antioxidant Enzymes and Oxidative Stress Biomarkers in Cigarette Smokers

Sangeeta Singh[1], Basant Joshi[2*],
Tapan Mohapatra[3]

Dept. of Biochemistry

SSJGIMSR, Almora[1], RMCH, Bareilly[2], Santosh Medical College, Ghaziabad[3]
Email- bjoshi86@gmail.com

Introduction : Cigarette Smoking (CS) is rich in Reactive Oxygen and Nitrogen Species (ROS and RNS). These can cause the production of other free radicals, which, in turn, initiate lipid peroxidation and cause several diseases. Free radical scavenger enzymes namely Superoxide Dismutase (SOD), Catalase (CAT) and Glutathione Peroxidase (GPx) represent the enzymatic part that have the ability to inhibit oxidative stress by scavenging the highly destructive free radicals. So we studied the effect of CS on selected antioxidant enzymes and oxidative stress biomarkers. Materials and Methods: A case control study was conducted, in which total of 284 healthy cigarette smokers (cases) in the age group of 18-60 years compared with age and sex matched 284 controls were included in the study. Estimation was done for serum 8-hydroxydeoxyguanosine (8-OHdG) by ELISA, Malondialdehyde (MDA) by TBARS, SOD by water soluble tetrazolium salt 1, GPx and CAT by colorimetric methods. Unpaired t-test and one-way ANOVA were used to analyse all the data for statistical significance. Results: The mean Serum MDA and 8-OHdG levels were significantly raised 7.47±1.84, 63.41±22.44 as compared to nonsmokers (3.90±1.03, 40.04±20.14) and serum SOD, Gpx and CAT levels were decreased 62.55±19.97, 44.45±16.60 and 12.92±10.16 in cigarette smokers as compared to nonsmokers 274.04±68.37, 208.56±75.63 and 127.82±18.68, respectively. These differences were also found to be statistically significant in cigarette smokers according to duration and number of cigarette smoked at the level of <0.05. Conclusion: In conclusion CS, especially long-term smoking may leads to significant changes in the enzymatic antioxidant defense systems of smokers.

Keywords : Catalase, Cigarette smokers, Glutathione peroxidase, Serum oxidase dismutase

PP-58

Reduction in Telomere Length of Leucocytes and Its Correlation with Biomarkers of Oxidative Stress during Human Aging

Somu Yadav, Pawan Kumar Maurya

Department of Biochemistry, Central University of Haryana, Mahendergarh, India
Email: ysomu100@gmail.com

Objective : To investigate the correlation between telomere length (TL) and biomarkers of oxidative stress. Methodology: Human blood was collected. Malondialdehyde (MDA) and reduced glutathione (GSH) assays were as per the standard protocols. Telomere length was measured by RT-PCR. The correlation between telomere length and biomarkers was established by statistical analysis. Results: We analyzed healthy 105 subjects of both sexes. A significant ($p<0.001$) age-dependent decline in telomere length was observed. Telomere length was positively correlated with the GSH ($r=0.8209$) while TL was negatively correlated with MDA ($r=-0.7191$). Conclusion: The telomere length has increasingly been used as a biomarker of human aging because it has been shown to predict the chances of survival and longevity. Oxidative stress is presumed to be a major cause of telomere shortening but the importance of oxidative stress as a determinant of telomere shortening remains less clear and has recently been questioned. Taken together, our findings supported the idea of a possible correlation between the TL length and biomarkers of oxidative stress during aging. Therefore, prospective and experimental studies are essential to establish a causal relationship between TL and oxidative stress markers and the possible mechanisms involved.

Keywords : Aging, Oxidative stress, Biomarkers, Red blood cells

PP-59

Ischemia-Modified Albumin as a Marker of Oxidative Stress in Patients with Locally Advanced Head and Neck Cancer

Madhumita R[1], Nivedita Nanda[1], Pooja Sethi[2]

[1]Department of Biochemistry, [2]Department of Radiotherapy,
Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry605 006, India
Email: drnnivedita@gmail.com

Objective : Head and neck cancer (HNC) accounts for 30% incidence of cancer in India. Oxidative stress (OS) can be one of the aetiologies as well as the after-effect in cancer. Being a non specific marker it is not usually monitored in HNC patients. Therefore, in the present study we have compared the efficacy of Ischemia-modified albumin as a marker of OS in comparison to total antioxidant status assay in HNC patients and healthy controls. Methodology: Forty locally advanced squamous cell carcinoma HNC patients and forty healthy individuals of similar age and gender were recruited. Their body mass index (BMI), waist hip ratio, blood pressure, albumin, total antioxidant status (TAS), ischemia modified albumin (IMA) and albumin levels were analyzed. IMA was adjusted for albumin level and its efficacy was compared against TAS using receiver operating curve (ROC). Results: BMI and WHR were significantly lower in HNC patients. IMA adjusted for albumin was higher and TAS was lower in HNC patients. TAS had a negative association with Adjusted IMA. In ROC curve, Adjusted IMA showed higher sensitivity (71%) and specificity (65%) compared to TAS. Conclusion: Antioxidant levels are significantly reduced in HNC patients. IMA when adjusted for albumin level can be considered a better marker for assessing OS in HNC patients compared to traditional marker TAS.

Keywords : Oxidative stress, Total antioxidant status, Squamous cell carcinoma

PP-60

Role of Ascorbic Acid- A Natural Antioxidant in the Treatment of Osteoporosis

Faiza Ismail[1], Abhishek Sharma[2] and Najmul Islam[1]

Department of Biochemistry, [1]Faculty of Medicine, JNMC, AMU, Aligarh, UP, [2]Government Medical College, Datia, MP., faizaismail22@gmail.com

Objective : To study the management and regulation of ROS and TNF-α activation in osteoporosis patient monocytes cultured under osteoclastogenic medium by co-culturing with natural antioxidant, ascorbic acid (rich in citrus fruits). Methodology: Effects of ascorbic acid were evaluated in the treatment of osteoporosis by employing cell culture study, ELISA, GPx activity determination and GSH assay. Results: Findings of the study showed marked suppression in GPx activity in osteoporosis patients ($n=30$; $p<0.001$) thereby showing impaired free radical neutralizing mechanism. Intramonocyte GSH levels were also significantly altered, indicative of weak antioxidant system. Lipid peroxidation by-product malondialdehyde (MDA) was high in monocytes culture of osteoporosis patients, thus confirming high oxidative stress in patients. Ascorbic acid increased GSH levels and GPx activity dose dependently to near normal values. Moreover, TNF-α and IL-1β levels in 24 hours monocyte culture supernatants were down regulated dose dependently (0-100µg/ml) in patients. Conclusion: Ascorbic acid thus has an important in quenching free radicals the main cause of osteoporosis and thus helpful in the management of osteoporosis.

Keywords : Glutathione peroxidase (GPx) activity, GSH, TNF-α

PP-61

Role of Manganese Superoxide Dismutase in Tuberculosis patients

Kavya Gauba, Shruti Gupta, Jyoti Shekhawat, Mithu Banerjee, Dharamveer Yadav, Praveen Sharma

Department of Biochemistry, All India Institute of Medical Sciences, Jodhpur, India

Background : Oxidative stress mediated by host cells, especially macrophages, plays a pivotal role in fighting TB infection. Antioxidants such as MnSOD (Manganese-Superoxide Dismutase) reduce this exacerbated oxidative stress response. However, the levels of these antioxidants are decreased in TB patients, thus causing lung injury and cavitations. The MnSOD Ala16Val polymorphism alters its synthesis, transport and activity in the mitochondria. This study aimed to evaluate serum levels of SOD2 along with Ala16Val polymorphism in the MnSOD gene to assess free radical injury in TB patients. Materials and methodology: 50 TB patients and 50 apparently healthy subjects were enrolled in the study. Serum was separated and MnSOD levels were estimated using sandwich ELISA. Genomic DNA was extracted from whole blood and subjected to PCR-RFLP for studying the polymorphism. Statistical analysis was performed using SPSS. Results: The mean value of serum SOD2 was found to be nearly three-folds lower in TB patients as compared to healthy subjects. The results showed that val/val genotype (mutant genotype) was higher in the patient group than the healthy subject group. Further, majority of the healthy subjects were heterozygous for the MnSOD gene. The difference observed between values of serum SOD2 levels in the different genotypes was statistically non-significant. Conclusion: The present study found that the serum levels of SOD2 were significantly lower in TB patients compared to healthy subjects. Distribution of genotypes of Ala16Val polymorphism was such that in patient group, the TT (homozygous mutant) was the major genotype; whereas in healthy subjects, the major genotype was CT (heterozygous variant).

Keywords : MnSOD, Tuberculosis, Antioxidants, Polymorphism

PP-62

Analysis of Anti-Oxidant Activity of Phytoestrogen Biochanin A, an Isoflavone Phytoestrogen

Anum Bushra, Sana Riaz, Somaiya Mateen, Shagufta Moin, Abul Faiz Faizy

Department of Biochemistry, J. N. Medical College, Aligarh Muslim University, Aligarh, India
Email: anum.bushra7@gmail.com

BCA (C16H12O5) is an O-methylated isoflavone (5,7-dihydroxy-4'-methoxyisoflavone). It is found mainly in leguminous plants of the family fabeacae like clovers, chick peas, alfafa and soy. Red clover (Trifolium pratense) is particularly rich in BCA. Various recent studies have attributed many health benefits to BCA. Objective: To determine the antioxidant activity of Biochanin A(BCA) by using in-vitro assay systems. Methodology: BCA was dissolved in DMSO in varying concentrations- 0.1 mM, 0.25 mM, 0.5 mM, 1 mM, 2 mM, 3 mM and 4 mM. Experiments were carried out to determine the anti-oxidant activity of the phytochemical using anti-oxidant assays like DPPH assay, FRAP assay, ABTS assay, hydroxyl radical scavenging activity assay, superoxide radical scavenging activity assay and analysis of metal chelating power. Results: The present study showed an increase in inhibition in DPPH radical, ABTS radical and hydroxyl radical scavenging activity with the increase in the concentration of BCA. The FRAP assay showed a concentration dependent increase in the reduction of μM of Fe3+ to Fe2. In case of hydroxyl radical scavenging and metal chelation, there was a concentration dependent increase followed by the subsequent decrease in the inhibition potential of the BCA. Conclusions: The present study found that BCA has significant anti-oxidant property. Therefore it might be used as an adjunct in the management of diseases involving redox imbalance.

Keywords : Biochanin A, redox imbalance, antioxidant

PP-63

Comparison of Serum Malondialdehyde in different stages of Chronic Kidney Disease with healthy control at Tertiary Care Hospital, IGIMS, Patna

Pallavi Sagar[a], Sandeep Kumar[a], Kumar Pranay[a], Ravi Shekhar[a], Prit Pal Singh[b]

[a]*Department of Biochemistry,*
[b]*Department of Nephrology,*
IGIMS, Sheikhpura, Patna, Bihar

Introduction : Chronic kidney disease (CKD) is a widespread public health problem, which may have several adverse consequences like renal failure, cardiovascular disease, and premature death. Several markers emerged as well-suited indicators of OS and AO in CKD like Malondialdehyde, lipid hydroperoxides, etc. The reduced activities of antioxidant enzymes status and increased production of Malondialdehyde in the CKD patients confirms the presence of oxidative stress. Aim: The objective of the study was to compare plasma malondialdehyde in different stages of chronic kidney disease with that of control. It is well known that inflammation has an important role in CKD and malondialdehyde (MDA) is an oxidant biomarker. Material and Methods 400 participants (Case and Control) were included in this cross-sectional and observational study. The study group were selected from nephrology OPD and general medicine OPD of IGIMS, Patna. The CKD patients were divided into three groups based on KDOQI CKD classification- Stage III, Stage IV and Stage V and control group included healthy people. Serum MDA levels were measured by Thiobarbituric acid (TBA) assay. Results: There The median MDA value in Stage III (5.47±3.03Umol/L),Stage IV (5.62±2.07Umol/L) and Stage V (7.61±5.35Umol/L) of CKD patients were high in comparison to healthy control (1.91±0.20). There was significant difference between the groups regarding the MDA values ($p<0.001$) with that of control. Conclusion: We concluded that MDA as a useful biomarkers in CKD patients.

Keywords: Chronic Kidney Disease, Oxidative stress, Malondialdehyde, Anti oxidants

PP-64

in silico Identification of Potential Inhibitory Action of Bio-Active Compounds of *Moringa Oleifera* against Hypoxia Inducible Factor 1 Alpha: a Prospective Therapeutic Approach against Breast Cancer

Neha Masarkar[1], Jagat Kanwar[1], Rajeev Nema[2], Mona Kriplani[3], Sukhes Mukherjee*

[1]*Department of Biochemistry,*
All India Institute of Medical Sciences (AIIMS) Saket Nagar, Bhopal, 462020
Email ID: neha.phd2019@aiimsbhopal.edu.in

Background : Breast cancer is one of the most heterogeneous and aggressive disease in women globally and a leading cause of death in women worldwide. The Breast tumors are hypoxic actively expressing HIF-1α, that activates the transcription of a large battery of genes encoding proteins that promotes tumor growth, metastasis, and is associated with poor prognosis. Based on the reported anti-cancer and cytotoxic activities of Moringa oleifera also called as the miracle plant, this study explores the inhibitory effect of phytochemicals from Moringa oleifera and identified the interaction between them and Breast cancer target protein (HIF-1α) in silico. Methodology: The phytochemical dataset of 110 known bio-active compounds of Moringa oleifera was screened by drug-likeness parameters and ADMET properties using SwissADME online server, to retrieve the potential inhibitors. 2 compounds with zero violations were chosen along with two clinical drugs as reference compounds – Doxorubicin and Paclitaxol investigated via molecular docking-based scoring using AutoDock Vina. The docking hits were further validated for their binding stability through molecular dynamics simulations and root mean square deviation analysis (RMSD). Results: The docking score and pharmacokinetic and pharmacodynamic properties of the compounds were promising suggesting that they can be developed as putative lead compounds against HIF-1α. Results suggested that two phytochemicals are better than the investigated clinical drugs. Conclusion: The compounds were computationally characterized and were found to bind with good affinity with the target protein. Further in vitro and in vivo studies are required to validate their efficacy in clinical settings.

Keywords : ADMET, Breast Cancer, Bio-active

compounds, Hypoxia Inducible Factor-1α, Molecular docking, Moringa oleifera.

PP-65

Preventive Effect of Barley in Triton X-100 Induced Hyperlipidemia in Rats

Samreen M Sheik[1], Revathi P Shenoy[1], Varashree BS[1], K.Sreedhara Ranganath Pai[2], Madhukar Mallya H[3], Deepak Nayak M[4].

[1]Department of Biochemistry, [4]Department of Pathology, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India-576104

[2]Department of Pharmacology,Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Karnataka,India-576104

[3]Department of Biochemistry, Melaka Manipal Medical College, Manipal, Manipal Academy of Higher Education (MAHE), Manipal, Karnataka, India -576104

Objective : To test the prevention effect of barley in triton X-100-induced hyperlipidemia in rats Methodology: Rats were grouped as control group fed normal chow diets, and experimental group served normal chow along with barley for 15 days.After 15days, rats are made to fast overnight and a single dose of intraperitoneal triton x-100(100mg/kg/body weight) was given to both the groups. Blood was withdrawn intra-orbit ally within 24hours and serum sample was collected for the assessment of lipid profile. Results: Statistically One-Way ANOVA was performed followed by the Post hoc Tukey test. There was a significant reduction in Triglyceride ($p<0.05$) and VLDL ($p<0.05$) levels in rats fed with barley. However, we didn't observe a statistical difference in Total cholesterol, HDL and LDL between the experimental group and the control group. Conclusion: In the triton X-100 model, the barley used as diet formulation prevented hyperlipidemia from developing. Conflict of interest: authors have no conflict of interest to declare.

Keywords : Barley, Dyslipidemia, Triton X-100, Nutraceuticals

PP-66

The Study of Association of Serum Malondialdehyde, Ceruloplasmin and Lipid Profile in Pre-Eclampsia: A Cross-Sectional Study

Apurva Sakarde[1], Ashok Kumar Ahirwar[2], Parveen Kavathekar[3], Vaijayanti Hardas[3]

Department of Biochemistry,

[1]All India Institute of Medical Sciences, Nagpur, Maharashtra, 441108, India

[2]University College of Medical Sciences, New Delhi 110095.

[3]Government Medical College, Aurangabad, Maharashtra, 431001, India

Introduction : Pre-eclampsia (PE) is a very common disease of pregnancy complicating about 5-10% of all pregnancies across the world. Oxidative stress and its metabolites in the pathogenesis of PE has been considered as debated area. Hence, the aim of the present work is to study the association of oxidative stress's markers such as serum malondialdehyde (MDA), ceruloplasmin and lipid profile in patients of pre-eclampsia. Materials and Methods: A cross-sectional study was conducted in which 100 pre -eclampsia patients and 50 healthy controls were included in the study. Pre – eclampsia patients were further subdivided into two groups, one group consisted of 50 mild pre-eclampsia patients and another group consisted of 50 severe pre eclampsia patients. Serum MDA, ceruloplasmin and lipid profile were estimated by spectrophotometry method. Results: Serum MDA and ceruloplasmin were significantly higher in pre-eclampsia patients as compared to healthy controls ($p<0.001$). An altered lipid profile was seen in the patients of pre-eclampsia as compared to controls. Serum MDA showed a positive correlation with serum ceruloplasmin among the study population. On binary logistic analysis, serum MDA and ceruloplasmin showed a significant odd ratio to predict pre-eclampsia. Conclusion: Pre-eclampsia is associated with altered lipid profile and increased oxidative stress markers i.e serum MDA and ceruloplasmin in pre-eclampsia. Thus, serum MDA and ceruloplasmin may be considered as risk factors for pre-eclampsia. Key Points: Pre-eclampsia, Serum malondialdehyde (MDA), Ceruloplasmin, Lipid profile.

Keywords: Pre-eclampsia, Serum malondialdehyde (MDA), Ceruloplasmin, Lipid profile

PP-67

Serum Lipoprotein (a) and Lipid Profile Levels in Young Patients with Established Atherosclerotic Cardiovascular Events

Navaneeth[1], Tom Devasia[1], Ganesh P[1], Shobha U Kamath[2], Ravishankar[3]

[1]Department of Cardiology, [2]Department of Biochemistry, Kasturba Medical College,

[3]Department of statistics, PSPH, Manipal,

Manipal Academy of Higher Education (MAHE), Manipal, Karnataka, India -576104
naviamin7@gmail.com

Objective : Serum lipoprotein (a) and lipid profile levels in young patients with established atherosclerotic cardiovascular events**.** Introduction: Acute myocardial infarction is the most important consequence of coronary artery disease. Although traditional risk factors of MI are helpful in diagnosis, specific clinical markers would be valuable in identifying the persons who are at risk. In the past few decades, much attention has been focused on serum Lp(a) and other lipids mainly because of their strong association with coronary artery disease. Methodology: 150 young male and female atherosclerotic cardiovascular disease patients (MI,CAD,PAD,Stroke) (< 45 years of age)with no traditional risk factors (diabetes, highcholesterol, hypertension, smoking, abnormal bodymass index) but with positivefamily history were selected for the study. None ofthe selected patients had a record of altered bloodpressure, hypercholesterolemia or altered bloodglucose levels. These patients fasting lipoproteins(a) and Lipid profile are measured and patients follow up done for next 18 months to access the major adverse cardiovascular events in elevated lp(a) patients. Results:Statistically significant differences were observed in the mean of serum Lp(a) concentrations in atherosclerotic cardiovascular disease patients and MACE associated with them. Conclusion: Our data suggests that irrespective of other traditional risk factors, increase in Lp(a) is an independent risk factor for atherosclerotic cardiovascular disease and major adverse cardiac events related to that patients with positive family history. Thus elevated levels of Lp(a) may serve as an important criterion to identify the individuals who need to undergo Lp(a) lowering treatment, thereby preventing them from cardiovascular events

Conflict of interest : authors have no conflict of interest to declare.

PP-68

Role of 4-Hydroxynonenal in Low Density Lipoprotein Modification: A Biophysical and Biochemical Approach

Neda Tufail*, Minhal Abidi, Saleem Javed, Moinuddin

Department of Biochemistry, Faculty of Medicine, Aligarh Muslim University, Aligarh, UP-202002
**Email: nedakhan3112@gmail.com*

Objective : To evaluate biophysical changes in native LDL and HNE modified LDL. Methods: LDL was incubated with increasing concentrations of HNE in PBS, pH 7.4. The reaction mixture was incubated at 37°C for 24 h followed by extensive dialysis. HNE-LDL was evaluated using various physicochemical techniques like UV-Vis spectroscopy, fluorescence, circular dichroism spectroscopy, FTIR, carbonyl content, TBARS, ANS, NBT reduction assay and SEM. Results: The HNE-LDL spectrum exhibited hyperchromicity with increasing concentrations of HNE. An increase in fluorescence intensity, a decrease in CD values and ANS fluorescence point towards structural and conformational changes in HNE-LDL were observed. The peak positions in FTIR spectroscopy demonstrated a change in the secondary structure of modified protein. Oxidation of protein results in an increase in ketoamine content and carbonyl content. MDA content was also found to be increased in HNE-LDL. SEM confirmed HNE induced aggregation of LDL. Conclusion: Incubation of LDL with HNE under *in vitro* conditions causes structural and conformational changes and induces oxidative stress, HNE-modified proteins can be used as biomarkers of oxidative stress due to their higher biological stability, compared to free HNE or even the oxidizing radicals itself. HNE-modified proteins have been detected in several diseases like systemic lupus erythematosus (SLE), RA and other diseases of auto-aggression

PP-69

Evaluation of Cytotoxicity of Human Serum Albumin Purified From SLE Patients

Manal Khursheed* and Zarina Arif

Department of Biochemistry, Jawaharlal Nehru Medical College, Faculty of Medicine, Aligarh Muslim University, Aligarh-202002
**email: manalkhursheed7399@gmail.com*

Background : Systemic lupus erythematosus (SLE) is an autoimmune disorder characterized by the production of a large number of inflammatory mediators. The reactive oxygen species (ROS) produced from these mediators has the potential to alter macromolecules both structurally and functionally. Human serum albumin (HSA) is one such macromolecule that is particularly susceptible to oxidative changes. Objective: The current study aimed to assess the repercussions of ROS induced changes in albumin of SLE patients through cytotoxic effects produced in lymphocytes. Methodology: Isolation of albumin from sera was carried out using the Aurum affi-gel blue column. Methods such as fluorescence measurements, circular dichroism, estimation of protein carbonyls, transmission electron microscopy, etc. were employed to examine the changes in albumin. MTT/ trypan blue exclusion assay and other biochemicals were used to evaluate the cytotoxicity of structurally/functionally modified HSA. Results: HSA isolated from SLE patients was found to be toxic to lymphocytes as the cell viability decreased substantially. Moreover, damage to cells was also evident as there was an enhanced leakage of catalase, superoxide dismutase and LDH. Detrimental effect of SLE HSA was further confirmed by dual staining and confocal microscopy. Conclusions: Persistent stress/inflammation in SLE patients may modify HSA and this modified HSA can be detrimental to cells and tissues, which may further aggravate the disease.

Keywords : Systemic lupus erythematosus, lymphocytes, albumin, reactive oxygen species

PP-70

A Biophysical Insight into the Structural Perturbations of Human Insulin Induced By Hydroxyl Radical (OH) Modification

Mohd Talha, Minhal Abidi and Moinuddin

Department of Biochemistry, Jawaharlal Nehru Medical College, AMU, Aligarh
Presenting Author: mohd.talha16@gmail.com

Objective : Reactive oxygen species (ROS) cause oxidative damage to proteins and generate deleterious by-products which induce a breakdown of immune tolerance and produce antibodies against host macromolecules with implication in human diseases. This study characterizes the hydroxyl radical (OH) modifications of insulin as the exposure to hydroxyl radical is known to cause dramatic changes in the structure, stability and functional properties of proteins. Methodology: Oxidative modification of human insulin was carried out *in vitro* by hydroxyl radical (OH), generated by Fenton's reaction, and the structural changes were studied by UV–Vis, fluorescence and Circular Dichroism spectroscopy, ATR-FTIR, Transmission and Scanning electron microscopy. To know the details of hydrophobic clusters on the insulin surface before and after OH treatment, protein-ANS binding study was performed. The carbonyl content was also quantitated in native and modified insulin. Change in the mass was studied with the help of MALDI-TOF. Result: The results demonstrate susceptibility of insulin to modifications induced by OH, as revealed by the increased UV absorbance, quenching of tyrosine fluorescence intensity, loss of α-helix and gain in β content. Increase in the mass of insulin was also observed. Modification caused an increase in the carbonyl content in insulin, exposed its hydrophobic patches and generated non-fibrillar, amorphous type of aggregates. Conclusion: In conclusion, insulin loses structural integrity to OH and forms amorphous aggregates. This study suggests that native insulin structure is highly prone to hydroxyl radical (OH) modifications. Moreover, this modification of human insulin might be important in the pathogenesis of diabetes mellitus.

Keywords : Hydroxyl radical, insulin, aggregates, diabetes mellitus.

PP-71

Targeting P-Glycoprotein Mediated Multidrug Resistance in Breast Cancer via Aurantiamide acetate- A New Avenue in Precision Oncology

Mona Kriplani, Sukhes Mukherjee

Department of Biochemistry, All India Institute of Medical Sciences, Bhopal

Statistics on breast cancer incidence and mortalities indicates that this disease is the second leading cause of death in women worldwide. The options available for breast cancer treatment include chemotherapy as adjuvant therapy which commands a lead still in clinical oncology. A major limitation to successful chemotherapy is the development of cellular resistance to multiple structurally unrelated anticancer drugs. This phenomenon has been termed as multidrug resistance (MDR), which occurs in a majority of breast cancer patients. One of the major mechanisms of MDR is the increased activity and overexpression of ABC transporters which extrude chemotherapeutic drugs outside of cancer cells. There are more than 20 members of ABC transporters reported to be involved in MDR but the P-glycoprotein p-gp encoded by the ABCB1 gene is the best characterized and identified member of the ABC-transporters family to be involved in MDR development in breast cancer. Therefore, downregulation of ABCB1-gene expression (P-gp) seems to be a novel approach for reversal of multidrug resistance (MDR). Several plant-derived phytochemicals play crucial roles in modulating ABCB1 gene expression and MDR reversal. Therefore, phytochemicals may be considered an alternative to synthetic small molecule P-gp inhibitors for the MDR reversal in cancer cells. This study discusses the role of natural phytochemical, Aurantiamide acetate from Piper aurantiacum that modulates ABCB1 expression in MDR cancer cells exhibiting the potential of Aurantiamide acetate in modulating ABCB1 gene expression and the reversal of MDR in breast cancer.

Keywords : Breast cancer, P-glycoprotein, Multidrug resistance, Aurantiamide acetate, Natural Product

PP-72

Analysis of Membrane Na^+, K^+ -ATPase Transporter in Quercetin Treated Erythrocytes during Human Aging

Akshay Kumar* and Pawan Kumar Maurya

Department of Biochemistry, Central University of Haryana, Mahendergah-123031, India
Email: akshaykhichi05@gmail.com

Objectives : Increasing interest has recently focused on determining whether natural compounds may exert anti-aging properties or not? Quercetin, a polyphenol, has received the most attention in this regard. The objective of this study was determination of ATP dependent transporter, Na+, K+ -ATPase activity in quercetin treated erythrocytes during human aging along with molecular docking studies. Methodology: The study was carried out on clinically relevant blood samples obtained from healthy subjects between the ages of 18-76 years. Results: *In vitro* administration of quercetin(10-6M to 10-3M final concentration) significantly attenuated deleterious effect of oxidative stress in red blood cells from all three age groups. Further, in silico studies were carried out to understand the possible mode of binding of quercetin with the catalytic unit (α unit) of Na+, K+-ATPase. Molecular docking simulation showed that quercetin can potentially interact with the target through multiple hydrogen bond interactions. Conclusion: We believe that these findings are novel and they will help in further research against oxidative stress in erythrocytes, thereby the study has remarkable scope in medical science.

Key words : Quercetin, Na^+, K^+ -ATPase, Aging

PP-73

Determining the Antioxidant Potential of Baicalein Using *in-vitro* Assay System

Sana Riaz, Anum Bushra,
Somaiya Mateen, Shagufta Moin

Department of Biochemistry, Jawaharlal Nehru Medical College, Faculty of Medicine, Aligarh Muslim University, Aligarh, India, ssaphire065@gmail.com

Objective : Baiclaein, a flavonoid is one of the main components of Scutellariabaicalensis and

Oroxylumindicum, which are consumed as teas or dietary supplements in the United States, Europe and Asia. Literature suggests the possible role of baicalein in the management of various disorders such as diabetes, cancer, neurodegenerative and inflammatory disorders. In the present study the antioxidant activity of baicalein was evaluated by using in vitro-assay system. Methodology:The antioxidant property of baicalein was studied by using different in-vitro assay systems such 1, 1-diphenyl-2-picryl-hydrazyl (DPPH) assay, ferric reducing antioxidant potential assay (FRAP), total –SH, ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)assay. Moreover, superoxide anion radical scavenging, hydroxyl radical scavenging, hydrogen peroxide scavenging, phosphomolybdenum assay and metal chelating power assays were also done by using varying concentrations of baicalein. Results: It was found that with increase in the concentration of baicalein there was significant enhancement in the percent inhibition of DPPH and ABTS radical. In addition, percent inhibition of hydrogen peroxide, superoxide anion and hydroxyl radical were also elevated with increase in the concentration of baicalein. Similar concentration dependent effect of baicalein was also observed in case of metal chelating, phosphomolybdenum and FRAPS assays. Conclusion: Our results strongly suggest that baicalein has significant antioxidant property and hence it might have the potential to overcome oxidative stress associated with various disorders.

Keywords : Baicalein, antioxidant activity, in-vitro assay system, radical scavenging property

PP-74

Association of Maternal blood Telomere Length & Oxidative stress markers in Late Preeclampsia

Ravoori Saideswar Rao[1], Manisha Singh[2], Preethi Sharma[1], Ritu Sharma[3], Rakesh Gupta[4], Mohit Mehndiratta[5], Rajarshi Kar[5]

[1]*Department of Biochemistry, Santosh Medical College & Hospital, Ghaziabad.*

[2]*Department of Biochemistry, Government Institute of Medical Sciences, Greater Noida, UP.*

[3]*Department of Obstetrics and Gynaecology, Government Institute of Medical Sciences, Greater Noida, UP.*

[4]*Government Institute of Medical Sciences, Greater Noida, UP.*

[5]*Department of Biochemistry, University college of medical sciences, Delhi.*
Email ID: sai.ravoori7@gmail.com

Objective : 1. To measure Telomere Length in maternal blood by RT-PCR-based techniques in Late Preeclampsia (LPE) and control groups. 2. To quantify circulatory blood Oxidative stress marker (Malondialdehyde (MDA) by ELISA kit (sandwich) in LPE and control groups. Methods: It is a case-control study. Each group consists of 40 subjects, cases (n 40) LPE are selected those with ⩾ 34 (weeks) gestational age, Hypertensive (⩾ SBP 140 mmHg, ⩾ DBP 90 mmHg at least two readings), proteinuria as per American College of Obstetricians and Gynaecologists (ACOG), control Healthy pregnant women. Samples were collected from the Department of Obstetrics and Gynaecology, Government Institute of Medical Sciences (GIMS), Greater Noida. All subjects gave signed informed consent. Obtained ethical clearance from IE-GIMS and Santhosh medical college, Ghaziabad. Telomere length by RT- PCR: DNA extraction as per manufacturer protocol (DNASure Blood Mini Kit, Nucleo-pore, Genetix Biotech Asia Pvt. Ltd., India.) and RT-PCR (reaction mixture, cyclic conditions) as per Cawthon et. all. Estimation of MDA by ELISA kit protocol (puregene, Genetix Biotech Asia Pvt. Ltd., India). Statistical analysis for non-normally distributed data and Mann -Whitney U test considered significance

p-value < 0.05. Results: There was reduced Telomere length, & increased MDA levels in Late Preeclampsia. Conclusion: The current study found a significantly reduced Telomere length, & increased MDA levels in Late Preeclampsia.

Keywords : Late Preeclampsia, Telomere length, MDA

PP-75

Identification of Biomarkers of Migraine in Central India

Kamran Alam[1], Ashish Kumar Yadav[2], Nirendra Rai[2] and Rashmi Chowdhary[1]

[1]Department of Biochemistry, [2]Department of Neurology,
All India Institute of Medical Sciences (AIIMS), Saket Nagar, Bhopal, Madhya Pradesh, 462020.
Mail id - rashmi.biochemistry@aiimsbhopal.edu.in

Background : According to numerous epidemiological studies, migraine is a chronic neurological condition in which various genetic variables play a key part in its etiology, and there is a familial susceptibility to it. As a result, understanding its susceptibility genes is critical to improving our understanding of the disease. In this case-control research, we looked at the effect of two single nucleotide polymorphisms (SNPs) in migraine risk in the Central Indian population: rs1929992 in Interleukin-33 (IL-33) and rs4379368 in succinyl-CoA-glutarate-CoA transferase (SUGCT) enzyme. Methods: Polymerase chain reaction and restriction-fragment-length polymorphism (PCR-RFLP) analyses were performed on a total of 70 samples. The relationship of distinct genotypic and allelic frequencies of SNPs in migraine was investigated using a univariate approach. Results: The T allele of rs4379368 does not follow the Hardy-Weinberg equilibrium and is more common in migraine patients (56%; P = 0.049). Thus, compared to the control groups, the CT and TT genotypes were more prevalent in migraine patients (51.0 percent and 34.7 percent vs. 46.0 percent and 27.8 percent, respectively; p = 0.019). The CC genotype of rs4379368 and the AA or AG genotypes of rs1929992 were shown to be linked with a lower incidence of migraine (p values 0.039). Clinical analysis by questionnaire and genotyping findings, were correlated. Conclusions: The results of this study suggest that genotype CT in rs4379368 and GG in rs1929992 could be a possible genetic marker for Migraine. However, larger sample size will be required to strengthen our findings.

Keywords : Migraine, Biomarkers, Polymorphism, Diagnostic, Genetics

PP-76

Genetic variations in ELMO1 associated with diabetic nephropathy in South Indians

V. Ramesh[1], D. Ponnudhali[2], G. Jayachandran[3], M. Sridevi[4]

Department of Biochemistry,

[1]Sri Ramakrishna Dental College & Hospital, Coimbatore

[2]Vinayaga Mission's Kirupananda Variyar Medical College & Hospital, Salem

[3]PSG IMSR, Coimbatore

[4]VMKVEC, Salem.

Background : For diabetic nephropathy (DN), several genetic loci were identified in different population. Only few of them have been validated. Replication studies in association of single nucleotide polymorphism gene, Engulfment and Cell Motility 1 (ELMO1) with DN were meagre in south Indian population. The aim of this study was to find out the association of a single nucleotide polymorphism(rs741301) of the ELMO1 gene with Type 2 diabetic nephropathy(T2DN). Methods: In the present study, 65 patients with T2DN, 80 healthy non-nephropathic subjects who were matched for age and sex were selected. Allele and genotype frequencies were determined by polymerase chain reaction followed by restriction fragment length polymorphism and agarose gel electrophoresis. In both groups, levels of FBS, creatinine, urea, HbA1C, urine albumin creatinine ratio (ACR) and estimated glomerular filtration rate were measured. Results: A statistically significant association was noted between G allele of rs741301 (odds ratio (OR) = 0.45[95 % CI 0.28 -0.73]; p value = 0.001) and DN. Also, genotypes of variant rs741301 in all subjects had significant difference with respect to the mean of ACR (p Value < 0.05). Conclusion: This study supports the role of ELMO1 gene polymorphisms (rs741301) in development of DN. Hence, ELMO1 plays a key role as a candidate gene in the susceptibility to DN in south Indians.

Keywords : Diabetic nephropathy, ELMO1 gene, rs741301 variant, single nucleotide polymorphism

PP-77

Circulating miRNA as a Biomarker in Diabetic Retinopathy

T. Shakthiya, Leena Chand,
Radha Annamalai

Sri Ramachandra Institute of Higher Education and Research
Shakthi1031993@gmail.com

Diabetic retinopathy (DR) is a microvascular complication of diabetes and a leading cause of vision disability in the general population worldwide. It is caused by abnormal retinal blood vessels that are either proliferative (PDR) or functionally incompetent, leaking fluid and lipid into the retina. A screening biomarker of diabetic retinopathy with high sensitivity and specificity would aid considerably in identifying those individuals in need of clinical assessment and treatment. The majority of the studies reviewed identified specific microRNAs in blood serum/plasma able to distinguish DM patients with retinopathy and progression of the disease from non-proliferative diabetic retinopathy to proliferative diabetic retinopathy. Hence this review analysis aimed to find the association of different types of micro-RNA in the progression of DR. MicroRNAs is short sequences of endogenous non-coding RNAs that emerged as a class of negative post-transcriptional modulators of gene expression. They are also released in the extracellular space and detectable in biological fluids such as serum, plasma, urine, tears, aqueous and vitreous humors. The miRNA stability in biological fluids raised the intriguing possibility that they could serve as disease biomarkers. This review, helps to enlist few important miRNAs which play key roles in the development and their association in various stages of DR. So, assessment of miRNA levels in serum may be an important tool for early diagnosis of diseases and their progression. Validation in different populations with large group sizes is required to make miRNAs as possible diagnostic and prognostic biomarkers of DR

Keywords : Micro-RNA, proliferative diabetic retinopathy, Non proliferative diabetic retinopathy, Diabetic retinopathy

PP-78

Hypomagnesemia is Associated with Risk of Metabolic Syndrome in Premenopausal Women

Deepa Gupta[1], Neelima Singh[2], Aditi Jindel[3], Kalyani Deshmukh[1], Suryakant Nagtilak[1]

[1]*Dept. of Biochemistry NAMO MERI, Silvassa,*
[2]*University of Kota,*
[3]*Aster Labs, Bengaluru*

Background & Objectives : Recently, a debate has immersed whether the concept of metabolic syndrome (MetS) has validity & clinical utility. Some believe it is useful, others disagree. MetS is a multiplex cardiovascular risk factor. MetS is one of the several patterns of risk for atherosclerotic cardiovascular disease (ASCVD) and type 2 diabetes mellitus (T2DM) as well. Studies suggested that low circulatory magnesium levels are related to MetS, T2DM, and CVD. Therefore, this study aim is to find the association between serum magnesium levels and risk for development of MetS. Methodology: The study was conducted in 200 premenopausal women of age 18-45 years and divided into two groups- with MetS (53, 26.5%) were considered as cases and without MetS (147, 73.5%) were considered as control healthy women. MetS was defined by NCEP-ATP III criteria. Serum Magnesium level was estimated by formazan dye method on dry chemistry analyzer VITROS 5600. Data were analyzed by using SPSS software, version 22.0 and $p<0.05$ was considered as statistically significant. Results: Serum magnesium levels were significantly decreased in women with MetS (1.7 mg/dL ±0.3) as compared with control group (2.0 mg/dL±0.5), $p<0.001$. A significant inverse correlation between serum magnesium levels and fasting blood sugar, triglyceride levels, systolic and diastolic blood pressure ($p<0.05$) whereas a positive correlation with high-density lipoprotein levels were found in premenopausal women with MetS. Conclusion: Hypomagnesemia plays a significant role in the pathogenesis of MetS and its associated complications. In view of this, supplementation of magnesium might improve the prevalence of MetS by reducing high blood pressure, hyperglycemia, and dyslipidemia.

Keywords : Magnesium, Metabolic Syndrome, ASCVD, T2DM

PP-79

Correlation of Serum Creatine Kinase (CK) and Lactate Dehydrogenase (LDH) in Patients with Hypothyroidism and Healthy Control

Parmanand Raju[1], Rekha Kumari[1], Ved Prakash[2], Sweta Kumari[1], Preetam Prakash[1], Ravi Shekhar[1]

[1]Department of Biochemistry, [2]Department of Endocrinology
IGIMS, Patna-800014
Email id: kumarprayan2018@gmail.com

Introduction : Thyroid disorders are very common worldwide. In India, prevalence of hypothyroidism is estimated to be 3.9%. In women the prevalence is higher, at 11.4% as compared to men which is 6.2%. Musculoskeletal features are very often observed in patients with hypothyroidism so alteration in serum levels of CK and LDH could be observed. Objective: To estimate serum levels of CK and LDH in patients with hypothyroidism and to correlate with that of healthy control. Materials & Methods: This was an observational study with sample size of 45 cases and 45 control and was carried out in the Department of Biochemistry, IGIMS, Patna. The clinically diagnosed cases of 18–60-year age group undergoing hormone replacement therapy were included. Patients with other diseases and on medications were excluded. Serum T3, T4 and TSH were measured by CLIA method on Architect i 2000, CK and LDH levels by Enzymatic method on automated analyser AU 5800. Result: The mean serum CK level in patients with hypothyroidism and healthy control were 145.73±109.83 and 110.46±42.18 (p value=0.0409) respectively. The mean level of LDH in patients suffering from hypothyroidism and healthy control were 233.9±49.11 U/L and 169.85±29.17 U/L (p value=0.0001) respectively. The mean serum level of TSH in hypothyroidism patients and healthy control were 7.08±11.88 and 2.44±1.51 µIU/ml (p value=0.0123) respectively. $p < 0.05$ was significant. Conclusion: The significant rise in serum levels of CK and LDH in patients with hypothyroidism indicates that these parameters can be used for screening the patients suffering from hypothyroidism.

Keywords : Creatine kinase, Lactate dehydrogenase, Hypothyroidism, Control

PP-80

Association of Plasminogen Activator Inhibitor-1(PAI-1) and Oxidized LDL in Metabolic Syndrome Patients

Gitanjali[1], Kirti[1], Navdeep[1], Ravinder Garg[2], Sumit K[2]

[1]Department of Biochemistry, 2Department of Medicine, GGS Medical College Faridkot, Punjab
gitanjaligoyal@ggsmch.org

Objectives : Metabolic syndrome is a constellation of various metabolic derangements that include hyperglycemia, dyslipidemia, high BMI and associated hypertension. The syndrome is associated with markedly increased risk of cardiovascular morbidity and mortality. The syndrome is characterized by atherogenic dyslipidemia, dysglycemia, insulin resistance, vascular dysregulation, prothromotic state and increased oxidative stress. The prothrombotic state along with oxidative stress play pivotal role in increasing morbidity in these patients. The study was planned to know the association of PAI-1 and oxidized LDL in metabolic syndrome patients. Methodology- The study was done in Department of Biochemistry and Dept of Medicine, GGS Medical college Faridkot after taking ethical clearance. The study was funded by MRU of GGS Medical College. A total 48 patients were enrolled for the study after taking informed written consent. Socioeconomic profile, age and sex matched 48 healthy participants were enrolled as control group. Metabolic syndrome was diagnosed according to NCEP ATP III guidelines based on demographic and biochemical analysis.PAI-1 and oxidized LDL were analysed by ELISA Results- The mean age of enrolled patients was 40.95= 10.78 years with M:F ratio of 1:1.16. The levels of PAI-1 and oxidized LDL were significantly high in cases as compared to control group($P = < 0.05$). Linear regression analysis was done for both the parameters which was found to be stastically significant. Conclusion- Metabolic syndrome is not merely a syndrome of dysglycemia and dyslipidemia, it is associated with much more adverse biochemical abnormalities which should be closely monitored to reduce morbidity and mortality associated with metabolic syndrome.

Keywords : MetS, PAI-1, oxidized LDL, dyslipidemia

PP-81

Comparison of Serum Matrix Metalloproteinase-13 between Grade 3 and Grade 4 stages of Osteoarthritis

Purushottam Kumar[1], Rekha Kumari[1], Ravi Shekhar[1], Ritesh Runu[2], Santosh Kumar[1]

[1]Department of Biochemistry, [2]Department of Orthopedics
IGIMS, Patna

INTRODUCTION Osteoarthritis (OA) is the most common form of degenerative joint disease characterized by progressive degeneration of articular cartilage, osteophyte formation and joint space narrowing. Matrix metalloproteinases (MMP) are potential biomarkers for Osteoarthritis. Objective Comparison of serum Matrix Metalloproteinase (MMP) 13 level in Grade 3 and Grade 4 stages of osteoarthritis according to Kellgren and Lawrence,s system of classification. Materials and methods A total of 54 subjects were included, of them 28 patients were with Grade 3 and 26 patients with Grade 4 knee osteoarthritis according to Kellgren & Lawrence criteria, has been enrolled in study. Venous blood has been collected from all of them for estimation of MMP-13 by ELISA. Results The mean value of Grade 3 serum MMP-13 (1.176 ± 0.041) was found elevated compared to Grade 4 (0.993 ± 0.117). Mann-Whitney U-test was performed to compare these two groups and there was a significant difference between these two groups, ($p < 0.05$). Conclusion: After progression of osteoarthritis from Grade 3 to Grade 4 according to Kellgren and Lawrence system of classification, the value of serum MMP-13 level decrease.

Keywords : Matrix metalloproteinase 13, Kellgren-Lawrence stage, Knee osteoarthritis, ELISA

PP-82

Serum Uric Acid Levels in Metabolic Syndrome (An Observational Study)

Shikha Komal, Yogesh Krishna Sahay, Madhu Sinha
Department of Biochemistry, Patna Medical College, Patna, Email ID: drskomal@gmail.com

Introduction Hyperuricemia reflects defects in insulin action on the renal tubular reabsorption of Uric Acid. Elevated levels of Serum Uric Acid (SUA) have been associated with Metabolic Syndrome (MetS). However, information is limited on the association between SUA and MetS in general adults. Objectives This study aimed to assess the relationship of SUA with MetS in adults presenting to Dept. of Medicine in Patna Medical College, Patna. Methodology The Harmonizing Definition criteria were applied to define MetS. 120 study subjects were enrolled and biochemical parameters including SUA, Fasting Blood Glucose (FBG), Serum Alanine Aminotransferase (ALT) and Fasting Lipid Profile (FLP) were analyzed using standard methods. 18 study subjects were excluded in view of extreme variables. Finally, a total of 102 study subjects were evaluated by SPSS 16.0 for association of SUA with MetS. Results/Conclusion Mean age was 52.25±13.65 years. 44 (43.1%) were males and 58 (56.9%) were females. Mean SUA was 4.97±1.66 mg%. 17.6% of study subjects had hyperuricemia. Out of non-diabetic study subjects, 24.3%, out of prediabetics, 7.7% and out of diabetics, 17.9% had hyperuricemia, which is considerably lower than reported in other studies.

Keywords : Metabolic Syndrome, Harmonizing Definition, Serum Uric Acid, Hyperuricemia

PP-83

A correlative study of Proteinuria, Renal Parameters, and Glycated Haemoglobin in Patients with Diabetic Nephropathy and Those with Diabetes mellitus without Nephropathy

Ramlingareddy

Dept of Biochemistry, SSIMS&RC, Davangere
Email ID: drramlingreddydeshmukh@gmail.com

Introduction : Proteinuria is not only the hallmark but also a prognostic factor of diabetic nephropathy. Proteinuria and other relevant biochemical parameters do play an important role in the management and prognosis of diabetic nephropathy. Aims and Objectives 1.To essay and compare serum urea, serum creatinine, urinary micro total proteins, urinary protein creatinine ratio, glycated haemoglobin, in patients with diabetic nephropathy and those with DM without nephropathy. 2.To study the correlation between 24 hour urinary micro total protein and urinary protein-creatinine ratio in diabetic nephropathy. Materials and Methods: This was a retrospective cross sectional study. Medical records of

all inpatients admitted to medicine ward during specific six months period with a diagnosis of type 2 diabetes with or without nephropathy were reviewed. Patients were categorised as Group 1 - diabetics with nephropathy; Group 2 – diabetics without complications Patients with comorbid hypertension, ischaemic heart disease, or other significant medical illness were excluded. Results: Ten out of 22(45.5%) patients with diabetic nephropathy had significant proteinuria (>300mg/day). Patients with diabetic nephropathy and diabetics without nephropathy showed significant group differences in serum creatinine, serum urea, urinary micro total protein (326.47 vs 18.41 P<0.01) and urinary protein-creatinine ratio (0.324 vs 0.007, P<0.01). Conclusion: There was a significant positive correlation (+0.84) between urinary micro total protein and urinary protein-creatinine ratio among patients with diabetic nephropathy. Assessment of Urinary micro total protein and urinary protein-creatinine ratio could be used as conventional biomarker

Keywords : Diabetic Nephropathy, Urinary micro total protein, Protein creatinine ratio

PP-84

Advanced Glycosylation End Products, Pathogenetic Basis of Diabetic Complications and Latest Anti AGEs Therapeutic Interventions

Zarin Jalal, Y. K. Sahay, Prerna Banthia

Department of Biochemistry, Patna Medical College, Patna, itszarin251@gmail.com

Advanced glycosylation end products (AGEs) are non enzymatic reaction products of reducing sugars and amino groups of proteins, lipids and nucleic acids forming schiff base further undergoing amadori rearrangement and dehydration leading to formation of fluorescent products which are irreversibly cross linked. Diabetes has been found to be associated with higher AGEs levels due to accelerated endogenous AGEs production. The ability of AGEs to form cross links with other proteins of the body (i.e collagen) is especially important in pathogenesis of diabetic complications – microvascular as well as macro vascular, nephropathy, neuropathy, retinopathy and cardiovascular complications. Several pharmacologic agents (e.g metformin, pioglitazone, ACE inhibitors, ARBs) have been found to have anti AGE effect, and several others are still under pre-clinical and clinical trials. The purpose of this study is to review recent research advances in genesis and accumulation of AGEs, its role in pathogenesis of diabetic complications and latest pharmacologic anti-AGE interventions. A systematic literature review has been done to explore the existing studies on AGEs, diabetes and diabetic complications. A number of studies have emphasized on the role of AGE-RAGE interaction in development of diabetic complications. AGEs upon binding to receptors for AGEs (RAGE) prompts oxidative stress and inflammation in different cells, thus promoting development of diabetic complications. Also, it can be used to assess prognosis in diabetic patients.

Keywords : AGEs, AGE – RAGE interaction, Diabetes, Diabetic complications

PP-85

Assessing Mineral Status among Patients with Essential Hypertension

Madhu babu, M.Vasanthan, Stanely, P.Renuka, VM.Vinodhini.

Department of bio-chemistry,SRM Medical College Hospital & Research Centre, Kattankulathur, Kancheepuram – 603203, Tamil nadu.

Hypertension is an important public health problem worldwide it leading risk factor for non communicable disease globally and it responsible for 13% global deaths and global disease in the year 2013 WHO 2008 statistic. Risk factor for hypertension is cardiovascular morbidity and mortality, cerebrovascular disease, stroke and renal dysfunction most commonly occur in conjunction with diabetes and also include age, obesity, excess salt intake, tobacco use, lack of physical activity and excess alcohol consumption that various minerals like sodium (Na^+), potassium (K^+), magnesium (Mg^{2+}), Calcium (Ca^{2+}), chloride (Cl^-), iron (Fe), phosphorous(P) could directly or indirectly influence the BP , major minerals involved within the regulation of BP, together with clinical evidence and their possible BP regulating mechanisms. These minerals illustrates the relationship between the subsequent on blood pressure sodium (Na) induce hypertension (excess dietary salt) not fully explored. Potassium (P) induces hypotension (by suppressing SNS). Calcium (Ca) intracellular regulates vascular tone

it direct impact on blood pressure. Magnesium (mg) is natural calcium channel blocker and it suppress calcium movement into endothelial and myocytes and its lower BP iron (haemoglobin) and transferrin level were positively associated with blood pressure and incident (increase) hypertension. Phosphorus decreased in hypertension but not fully explored.

Keywords : Blood pressure, Sympathetic nervous system, Sodium, Potassium, Magnesium, Iron, Phosphorus, Calcium, Chloride.

PP-86

A Case Study of a 14-Year Boy with Discrepant Thyroid Function Test (TFT)

Smita Gawandi, J Kumarasamy,
Savita Kulkarni

Radiation Medicine Centre, B.A.R.C.

Aim : To investigate the cause of discrepant thyroid function tests (TFT) in a boy with congenital hypothyroidism (CH). Introduction: A certain population of the patients exhibit discordant TFT consistently, which cause equivocation during diagnosis and treatment. A patient (M/14) who was a case of congenital hypothyroidism, was referred to RMC for discrepant TFT i.e., simultaneous elevation in both T4 and TSH levels. He was on thyroxine therapy since birth and the dose was changed multiple times during last 14 years to normalise TFT. He had no history of pituitary abnormality. His case was investigated for presence of Thyroxine binding globulin (TBG) excess and thyroid hormone resistance syndrome (THRS) as these conditions can cause simultaneous elevation in T4 and TSH in presence of hypothyroidism. Materials & Methods: T4, TSH, FT4, anti-TPO and TBG levels were estimated by immunoassays. For mutational screening, the coding regions of TBG and thyroid hormone β receptor (THRβ) genes were sequenced. Results: TBG level in the patient was 80 µg/ml which was three-fold excess than normal range. No alteration in the coding region of the TBG gene was detected. The sequence of THRβ gene was normal except a presence of a heterozygous silent mutation in the Exon 8. Conclusion: The simultaneous elevation in the T4 and TSH levels in the proband was TBG-excess coexisting with CH. The estimation of TBG levels and appropriate genetic investigations can provide additional diagnostic information which would definitely help in unequivocal diagnosis and treatment of thyroid disorders associated with discrepant TFT levels.

Keywords : Thyroid function tests, Thyroxine binding globulin, Congenital hypothyroidism, THRS

PP-87

Atherogenic Lipid Indices in Gestational Diabetes Mellitus – To Worry or Not To Worry?

Rakchna M[1], Nivedita Nanda[2], Haritha Sagili[3]

[1]*Department of Biochemistry, Sri Ramachandra Institute of Higher Education and Research, Chennai, India*

[2]*Department of Biochemistry,* [3]*Department of Obstetrics & Gynaecology,*

Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India
Email of presenting author: rakchna@gmail.com

INTRODUCTION & OBJECTIVES : Gestational diabetes mellitus (GDM) is defined by the ADA as "hyperglycemia diagnosed for the first time during the second or third trimester of pregnancy." The prevalence of GDM in Tamil Nadu is as high as 18.9%. These women are at a grave liability to develop cardiovascular disease (CVD) regardless of progression to type 2 diabetes mellitus. Atherogenic indices are lipid ratios derived from the lipid profile. These indices are robust in identifying the risk for long-term CVD development. These indices are ideal for population-level screening strategies since they are readily available in most laboratories. The study aims to compare the atherogenic indices in GDM patients and normal pregnancies. METHODOLOGY: This was a cross-sectional study. This study had two groups, GDM patients and normal antenatal women. Parameters were measured using commercially standard kits in the laboratory. RESULTS The atherogenic lipid indices were significantly higher in the cases when compared with the controls viz., Triglyceride glucose index (TyG) ($p<0.001$), Atherogenic index of plasma (log TGL/HDL-C) ($p=0.004$), Atherogenic coefficient (TC-HDL-C/HDL-C) ($p=0.001$), Castelli's risk index I (TC/HDL-C) ($p=0.001$) & Castelli's risk index II (LDL-C/HDL-C) ($p=0.001$). CONCLUSION: The findings validate the fact that women with GDM are susceptible to develop

CVD much earlier than their normal counterparts. These atherogenic indices can be used as screening tools in all GDM patients for early risk assessment and management. It would not only reduce the mortality imposed by CVD but also limit the overhead economic expenditure incurred by CVD complications in the long run.

Keywords : GDM, CVD, atherogenic

PP-88

Serum Irisin and Triglycerides Glucose Index as Markers of Insulin Resistance in Young Adults

Nilofer Sagana MK, KA.Arul Senghor,
Renuka.P, VM.Vinodhini

Department of Biochemistry, SRM Medical College Hospital & Research Centre,

Kattankulathur, Kancheepuram-603203, Tamilnadu, India.

INTRODUCTION : Diabetes risk scoring in young adults based on modifiable (waist circumference, physical activity) and non-modifiable risk factors (age, family history) for Diabetes. AIM: To investigate serum Irisin and Triglyceride glucose index (TyG index) as predictors of insulin resistance and the risk of diabetes in young adults. METHODOLOGY: This study is an observational cross-sectional study conducted in Master Health Checkup, SRM Medical College Hospital & Research Centre. The study will be conducted in 80 participants in the age group of 18 – 35 yrs (both male and female) attending the master health check-up. With consent from the patient anthropometric measurements were documented. Known DM, hypertension, kidney, liver diseases, cardiovascular diseases are excluded. TyG index is derived from log of product of fasting plasma glucose and triglyceride levels. Serum Irisin analysed in Bio-Rad ELISA using standard kit. HYPOTHESIS: Irisin levels is expected to decrease with the increasing severity of MDRF-IDRS score and reflects the severity of insulin resistance. TyG index is expected to be low in individuals with metabolically unhealthy lipid environment and will associate with MDRF-IDRS score. Increased triglyceride levels can lead to increased flux of free fatty acids to non-adipose tissue that may affect glycemic control thereby increases the risk of Diabetes and cardiovascular diseases. TyG index, WC and Irisin can be used as reliable markers that can predict the risk of reduced insulin sensitivity and risk of Diabetes Mellitus in young adults.

Keywords : Triglycerides glucose index (TyG), Diabetes Mellitus (DM), Madras Diabetic Research Foundation-Indian Diabetes Risk Score (MDRF-IDRS),Waist Circumference(WC).

PP-89

A Comparative Study of Risk Factors Associated with Obesity among Diabetics and Non-Diabetics

Aihik Saha, Sandip Chakraborty
Sayantan Dasgupta, Soma Gupta

Dept of Biochemistry, NRS Medical College & Hospital, Kolkata

Objectives : i) To measure and compare biochemical parameters like Lipid profile and Leptin among Obese Patients with and without Diabetes Mellitus. ii) To study FTO gene polymorphism among the study population. Methodology: This Observational cross sectional study was carried out at the Department of Biochemistry, Nil Ratan Sircar Medical College during the year 2020. Obese individuals were recruited for the study from the medicine OPD and after due consent. Demographic data were collected, physical indices were measured and blood samples were collected. Serum was separated from clot vials and estimation of Lipid profile (Enzymatic Method) and Leptin (ELISA) were carried out. DNA extraction was carried out from EDTA vials using necessary Kit. PCR was carried out for the FTO rs9939609 allele and later digested by ScaI to detect polymorphism. Results: The levels of leptin were found to be more in obese individuals irrespective of the presence of diabetes. The FTO 9939609 polymorphism in the population of Bengal was in accordance with the Hardy-Weinberg principle. Conclusion: The regulatory role of adepokine like leptin can be strengthened from this study. This study also shows that the frequency of FTO 9939609 polymorphism is similar to other studies conducted previously in the country.

Keywords : obesity, diabetes, leptin, FTOgene

PP-90

Study of Association between Serum Bilirubin and Urine Microalbumin Levels in Type 2 Diabetes Mellitus Patients

Renuka P*, Suma M, Vinodhini V.M

Department of Biochemistry, SRM Medical College Hospital & Research Centre, SRMIST, Kattankulathur, Kancheepuram, Tamil Nadu, India.
**rpangaluri@gmail.com*

Objective : Diabetic nephropathy is one of the major chronic complications in diabetes mellitus (DM). Bilirubin being a potent physiological antioxidant, prevents renal and cardiovascular complications in DM. Microalbuminuria is reported as an early marker for Diabetic nephropathy and CVD in type 2 diabetes mellitus patients. The main objective is to determine the correlation between serum bilirubin and urine microalbumin in type 2 DM subjects. Methods: This is a case-control study involving 36 Type 2 Diabetes mellitus patients aged between 30-70 years attending Diabetic OPD at SRM Medical College Hospital & Research Centre along with 36 age and sex matched apparently healthy individuals as control. Fasting plasma glucose, postprandial plasma glucose, HbA1c, serum total bilirubin, blood urea, serum creatinine and spot urine sample for microalbumin were measured. Data were analyzed using SPSS statistics V 25.0 software. The P value <0.05 was considered as statistically significant. Results: The mean levels of fasting plasma glucose, post prandial blood glucose, HbA1c, albuminuria (ACR), blood urea, and serum creatinine were found to be significantly increased and serum total bilirubin concentration was decreased in type 2 diabetic patients. Serum total bilirubin showed a negative correlation with albuminuria (ACR), and fasting plasma glucose among Type 2 diabetic patients. Conclusion: This study shows elevated urine micro albumin excretion which has been reported to be an early marker for diagnosis of diabetic nephropathy and high bilirubin levels might protect against the progression of diabetic nephropathy in patients with type 2 diabetes.

Keywords : Type 2 diabetes, Diabetic nephropathy, bilirubin, urine microalbumin

PP-91

A Study on Changes in Hormonal Imbalance in Polycystic Ovary Syndrome with Advancing Age and Body Mass Index

Pravesh Hegde, Prasanna Kumar Shetty[1],
Dr. Shilpa S Shetty[3], Dr.Suchetha Kumari N*

[1]Dept of Biochemistry, [2]Dept of OBG, [3]Central Research Laboratory,
KS Hegde Medical Academy, NITTE Deemed to be University

Background & Objective : Polycystic ovary syndrome (PCOS) is a diverse condition that contributes to metabolic problems like insulin resistance and hyperandrogenism which women experience during their reproductive years and it is closely related to the body mass index. The present study was to assess the clinical, biochemical, and hormonal profile of PCOS and healthy women concerning age and BMI and also to correlate insulin with other parameters. Methods: This hospital-based case-control study was conducted from June 2019- April 2021. We studied 180 women with PCOS and 170 age-matched control women from Mangalore, Karnataka. Anthropometric measurements, biochemical, hormonal profile, and the presence of IR were estimated in all patients and were further subdivided based on age and BMI. Results: The mean age of patients with PCOS and controls was 25.9± 5.6 years vs 24.7 ± 6.8 years. BMI and WHR were statistically significant ($p<0.01$) between the groups. TG & HDL were statistically significant ($p<0.05$) in both age groups also who were underweight and had normal BMI. There was a statistically significant difference ($p<0.05$) in plasma insulin and HOMA-IR in all groups except in women who were obese. Conclusion: PCOS women were presented with hyperandrogenism and had metabolic risk factors like insulin resistance and low HDL-C levels at budding age and increased BMI. Our findings suggest that differences found might play a key role in pathophysiology and necessary screening of IR and early periodic examination of lipids and hormones with necessary dietary intake to reduce body mass is highly advisable.

Keywords : Age group, Body mass index, Insulin Resistance, Lipid profile, Polycystic ovary syndrome.

PP-92

A Study on Prevalence Of PCOS among Reproductive Age Group Women and Its Association with Vitamin D and Insulin Resistance in RIMS Ranchi: A Cross Sectional Study

Asha Oroan, Pradeep Minz, Bela Rose Ekka

Department of Biochemistry, RIMS, Ranchi

Objectives To study the prevalence of PCOS among reproductive age group women. To study the vitamin D status in women with or without PCOS. To determine the association between vitamin D status and insulin resistance in PCOS women. Materials & Methods A cross sectional study was conducted during a period of March 2020 to March 2021 at RIMS, Ranchi, where total 250 cases were included, out of which 40 were diagnosed PCOS women based on Rotterdam diagnostic criteria and 210 were found without PCOS. The participant age group was between 15 to 45 years. Results: A total of 250 cases were taken consecutively in which 40 were diagnosed PCOS women and 210 women were without PCOS. The serum 25 (OH)D concentration was found to be low among women with PCOS and without PCOS. The prevalence rate of 25 (OH)D deficiency and insufficiency were similar in both groups.Serum 25(OH)D concentration was significantly lower in PCOS women with insulin resistance than in women without insulin resistance($p<0.05$). Conclusion: Our study shows higher prevalence of PCOS among reproductive age women. In India, the prevalence ranges from 2-26%. In this study prevalence of 25 (OH)D deficiency occurred in women both with/without PCOS and there is an associations between low serum 25(OH)D with a higher insulin resistance in women with PCOS. Vitamin D deficiency may play a role in exacerbating PCOS, so Vitamin D supplementation should be given in the management of PCOS.

Keywords : PCOS, 25(OH)D, insulin resistance, reproductive age

PP-93

Therapeutic Efficacy of *Trigonellafoenum-graecum* L. Seed Extract in Modulation of Biomarkers in Ovariectomized Rats Fed with High Fat Diet

Takkella Nagamma[1], Anjaneyulu Konuri[2], Padmanabha Udupa[3], Yogendra Nayak[4]

[1]*Department of Biochemistry, Melaka Manipal Medical College (Manipal Campus),*

[2]*Department of Anatomy, Manipal-TATA Medical College,*

[3]*Departments of Biochemistry, Kasturba Medical College,*

[4]*Department of Pharmacology, Manipal College of Pharmaceutical Sciences,*

Manipal Academy of Higher Education, Manipal, Karnataka, India – 576104

Objectives : The purpose was to study the changes in biomarkers and its modulations by petroleum ether fraction of *Trigonellafoenum-graecum*L (PE-TFG) seed extract in ovariectomized rats fed with high fat diet. Methodology: Six groups of female Sprague Dawley rats were used and each group had six rats. The groups were high fat diet (HFD), Ovariectomized+HFD (OVX+HFD), OVX+HFD+PE-TFG, OVX+HFD+Atorvastatin, OVX+HFD+Diosgenin and OVX+HFD+17β-estradiol. Three weeks after ovariectomy, all the groups were treated with HFD along with PE-TFG seed extract, ATR, DIS, and E2 for 12 weeks. The rats were sacrificed after 12 weeks of treatment. The samples such as blood andliver was collected for testing bio markers such as TNF-α leptin, lipid profile, hepatic markers, antioxidants and oxidative stress markers. Results: The OVX+HFD group showed significantly elevated AST, ALT, and decreased HDL compared to HFD group ($P<0.05$). The PE-TFG treatment decreased the elevation of total cholesterol, triglyceride, AST, ALT.Thiobarbituric acid reactive substances (TBARS) was significantly increased in OVX+HFD rats compared to HFD group ($P<0.05$). Leptin and TNF-α were significantly decreased ($P<0.01$) after treatment with PE-TFG seed extract. Conclusion: PE-TFGsupplementation played a significant role in

reversing the effect of oavriectomy and HFD. This effect may be due to the presence of phytoestrogen components and other components like phenols, flavonoids, and phytoestrogen component present in PE-TFG seeds. PE-TFG can be a therapeutic agent for treating menopause induced changes such as metabolic and cardiovascular complications.

Keywords : Post-menopause, ovariectomy, lipid profile

PP-94

Serum Uric Acid Level among Acute Cerebrovascular Accident Patients in Manipur

H. Lakhipyari Devi, Davina Hijam,
Tina Das, Ibetombi Devi

Department of Biochemistry, Regional Institue of Medical Sciences, Imphal
Email: davina_hijam@yahoo.co.in

A large number of studies in the past gives conflicting results about the role of uric acid as a risk factor in patients with acute cerebrovascular accident(CVA). This study was carried out to measure the level of uric acid among acute cases of CVA and compare it with normal controls and also to find its relationship with cerebrovascular risk factors. It was a cross sectional study, carried out on 60 patients with acute stroke admitted in Regional institute of Medical Sciences(RIMS) hospital, Imphal, from Oct 2017 to Oct 2019. Another 60 healthy individuals were taken as controls. Serum uric acid was measured by Enzymatic Colorimetric method. Mean age of the patients was 58.35+11.54 years. Out of 60 patients, 54 were hypertensive, 28 had haemorrhagic stroke and 32 had Ischemic stroke. Serum uric acid level was significantly higher in CVA cases (7.64±2.01)mg/dL compared to controls(5.06±0.98)mg / dL. The level of uric acid was found to be significantly higher in males (8.55±1.75)mg/dl compared to females(6.54±1.75)mg /dL. Maximum patients had uric acid level >8mg/dl. The level of uric acid was found to be more among the patients of ischemic stroke (7.97±1.87mg/dl) compared to hemorrhagic stroke (7.27±2.13 mg/dl) A strong significant positive correlation was observed with all the lipid parameters except a significant negative correlation with HDL cholesterol. This study concluded that increased serum uric acid may be considered as a risk factor of acute cerebrovascular accident.

Keywords : Cerebrovascular Accident, Uric acid, Hemorrhagic stroke, Ischemic stroke.

PP-95

Role of ADA in Serum and Pleural Fluid for Diagnosis of Pulmonary Tuberculosis

Supriya, Suman Jain

Department of Biochemistry, Pacific institute of Medical Sciences, Umarda, Udaipur

Background and Objective : The ADA increase has been attributed to cell mediated response to Mycobacterium Antigens. Hence, the study was conducted to evaluate the level of ADA in Serum and Pleural Fluid to find its role for early diagnosis of Pulmonary Tuberculosis (PTB). Method: The study was conducted on 76 subjects and was divided into two groups. Group-I include 35 subjects as healthy control and Group-II include 41 PTB patients, which has 28 sputum negative (-ve AFB) patients and 13 sputum positive (+ve AFB) patients between the age group of 25-83 years. ADA level was estimated in serum and pleural Fluid in both the groups of patients in tertiary care hospital, Udaipur. Results: The ADA level in Serum and pleural fluid were significantly higher in sputum positive (+ve AFB) patients; 35.62±2.41 and 29.27±3.20 as compared to sputum negative (-ve AFB) patients; 57.40±32.14 and 55.94±18.60. Further, serum ADA was significantly higher in PTB patients than the healthy control group. Conclusion: ADA determination is as fast and discriminating test for early diagnosis of PTB and may probably reflects differences in cellular immune response to different infectious agent.

Keywords : Adenosine deaminase, pulmonary tuberculosis, Pleural Fluid, Acid Fast Bacili

PP-96

Study of Thyroid Profile in Type 2 Diabetes Mellitus Patients

Rubana Kauser , Md. Faizur Rahman , Md. Ezaz Zafar , Sangita Choudhary , Jyoti Jha , Arif Iqubal

Department of Biochemistry, Katihar Medical College, Katihar, Bihar

Introduction : Diabetes mellitus (DM) and Thyroid dysfunction (TD) are endocrinopathies that are seen very commonly in routine practices, and frequently coexist. A high prevalence of TD is seen among both type 1 and type 2 Diabetes Mellitus patients. This study is done with the aim to find the prevalence of TD in T2DM patients who are visiting Katihar Medical College and the objective is to access a systemic approach to thyroid testing in patients of T2DM to prevent complication if diagnosed early. Methods: This hospital based cross sectional study was conducted among 120 Type 2 Diabetes Mellitus Patients between February 2021 to August 2021. The patients were enrolled from the outpatient unit of the Department of Medicine and the investigations were conducted in the Department of Biochemistry of Katihar Medical College. Results: There were 70 (58%) males and 50 (42%) females with T2DM in which including both male and female 40 were euthyroid, 10 were hyperthyroid and 70 were hypothyroid. TSH level was high in 58.3% (70) and T3 was decreased in them of which 29.16% (35) were females and 29.16% (35) males. Conclusion: There is high prevalence of hypothyroidism in patients with T2DM in the katihar district of Bihar. Therefore, screening for hypothyroidism should be considered for early diagnosis and effective management.

Keywords : Diabetes, Thyroid, prevalence

PP-97

To Study the Level of Serum Sodium in Hypothyroid Patients

Gulshan Prakash[1], Sumit Dokwal[1], Piyush Bansal[2]

Department of Biochemistry
[1]Pt. B.D. Sharma PGIMS, Rohtak, [2]B.P.S Govt. Medical College , Khanpur, Sonepat.
Email id: gulshanprakash.chahal@gmail.com

OBJECTIVE : To evaluate the levels of Serum Sodium in hypothyroid patients. Methodology: 60 patients were selected from the endocrine OPD of PGIMS Rohtak. Their TSH levels were evaluated by two site sandwiched immunoassay using chemiluminometric technology and their serum Sodium levels were evaluated by electrolyte analyser using ion selective electrode method. These 60 patients were divided in 2 groups according to TSH values Result: The mean TSH level was 9.25 µIU/ml and their mean Sodium level is 127 mmol/dl in 39 patients. Their results were tested by a T test which showed no significance at p=0.34. The rest 21 patients had a mean TSH 135.10 µIU/ml and their mean Serum Sodium level was 114 mmol/dl and these results showed a significance of p<0.1 Conclusion: In severe hypothyroidism there is hyponatremia in comparison to mild or moderate hypothyroidism pertaining to further studies.

Keywords : Hypothyroidism, Hyponatremia, Sodium, TSH

PP-98

To Assess the Exocrine Function Of Pancreas in Patients with Type II Diabetes Mellitus

Aafrin Daruwala, H.B. Sirajwala

Biochemistry Department, Medical College Baroda and S.S.G Hospital, Vadodara.
E-mail Id: aafrindaruwala@gmail.com

INTRODUCTION : Diabetes Mellitus (DM) is a metabolic disease due to absolute or relative insulin deficiency. Insulin secretion is normal in Type-II DM, but receptors are defective. Insulin affects lipid metabolism which causes deposition of FFA that lead to atrophy of acinar cells of pancreas that leads to decrease Amylase & Lipase activity in patients with Type II DM

OBJECTIVES:- To assess the levels of serum amylase, serum lipase and fasting blood glucose in patients with Type-II Diabetes Mellitus and compare and correlate with healthy controls. METHODOLOGY: - This is an Analytical Cross-sectional Study which was conducted in Biochemistry Department, S.S.G Hospital, Vadodara from July-21 to August-21. 50 confirmed Type II DM patients were included in this study from Diabetic OPD of Our Hospital and 50 Healthy controls were included as control group. Blood samples were collected and analyzed by using an Fully Automated Biochemistry Analyzer for serum amylase, serum lipase and Blood glucose. Results were analyzed statistically by using Independent Student's "t" test and Pearson's correlation coefficients. RESULTS: - We found significantly low levels of serum amylase, serum lipase ($p < 0.001$) in cases in comparision to the healthy controls. CONCLUSION: - It is concluded from our study that exocrine portion of pancreas gets affected by Diabetes mellitus.

Keywords : Amylase, Lipase, Type-II Diabetes Mellitus, Pancreas

PP-99

A Comparative Study of Selenium and Deiodinase Enzyme among Healthy Controls and Hypothyroid Patients

Priya K. Dhas, G. Ramani

Department of Biochemistry, Vinayaka Mission's Kirupananda Variyar Medical College and Hospitals, Salem.
priyakdhas79@gmail.com

OBJECTIVES : In this paper, we aimed to analyze whether the altered thyroid profile observed in subclinical hypothyroidism is due to the deficiency of selenium or due to the decreased activity of deioidnase enzyme involved in thyroid hormone metabolism. Materials and methods: The study included the patients attending the outpatient department of General Medicine of VMKV Medical college and Hospitals, Salem. The study participants were classified into 3 groups based on their thyroid profile as Group 1- Patients with Subclinical hypothyroidism (n=20), Group 2: Patients with hypothyroidism (n=20), Group 3: Control (n=20). After obtaining informed consent from the study participants, blood sample were collected for Selenium and deiodinase assay. Selenium was performed in mass spectrophotometer using whole blood and deiodinase activity was measured in serum by ELISA method. Result: Our results showed a decreased level of selenium and decreased activity of deiodinase in subclinical hypothyroidism when compared to hypothyroidism and healthy controls. Conclusion: The enzyme deiodinase which is a selenoprotein is involved in the conversion of T4 to T3 in the thyroid gland. Deficiency of selenium in the body may affect the activity of the enzyme resulting in decreased synthesis of T3. Hence, to maintain thyroid level and overall health the physiological concentration of selenium should be maintained through a balanced diet or through supplementation.

Keywords : Selenium, deiodinase, subclinical hypothyroidism

PP-100

Estimation of IL-18 Levels in Newly Diagnosed Type 2 Diabetes Mellitus

Abhilasha[1], Mitra P[2], Suri S[2], Saxena I[3], Shukla RG[4], Sharma P[4]

[1]*Department of Biochemistry, All India Institute of Medical Sciences, Patna*
[2]*Department of Biochemistry, Post Graduate Institute of Medical Education & Research, Chandigarh*
[3]*Department of Biochemistry, All India Institute of Medical Sciences, Gorakhpur*
[4]*Department of Endocrinology, All India Institute of Medical Sciences, Jodhpur*
Email id: abhilashabankul@gmail.com

OBJECTIVE : Type 2 diabetes mellitus (T2DM) is a multifactorial disorder in which genetic, lifestyle changes and environmental factors are involved, in the development of insulin resistance, leading to hyperglycemia. Previous studies have reported the role of inflammation in the pathogenesis of type 2 diabetes mellitus. This has increased the significance of inflammatory markers as prognostic biomarkers of early diagnosis and progression of the disease. Several cytokines, such as IL-2, IL-6, and IL-18 are observed to be associated with type 2 diabetes mellitus. Some studies have reported a plausible association of IL-18 with type 2 diabetes, but the data is unclear and inconsistent. The present study aimed to compare IL-18 levels in newly diagnosed type 2 diabetes mellitus patients with non-diabetic controls. Methodology: 35 newly diagnosed diabetic cases and 35 non-diabetic controls were recruited after obtaining due informed consent. Venous

whole blood was collected under aseptic conditions. Biochemical parameters were analyzed using the autoanalyzer. Serum levels of IL-18 were performed using a commercially available ELISA kit. Results: The fasting blood sugar levels and glycated hemoglobin were significantly higher in T2DM patients than controls ($p<0.001$). The mean ± SD of IL-18 was significantly higher ($p=0.0068$) among cases when compared to controls (696.9 ± 282.1 pg/ml and 524.4 ± 171.9 pg/ml respectively). Conclusion: Findings from the present study suggest the pro-inflammatory role of IL-18 in newly diagnosed Type 2 Diabetes Mellitus.

Keywords : Diabetes, IL, Glycated hemoglobin, IL-18

PP-101

Assessment of Effect of Yoga on Insulin Resistance and Beta Cell Function

Chetna, Saini N, Rajput R**, Kharb S*

**Department of Biochemistry,*
***Department of Endocrinology, PGIMS Rohtak*
Email Id: coolchetna91@gmail.com

OBJECTIVE : To assess effect of Yoga on insulin resistance and beta cell function. Methodology: The study was a cohort study carried out on 100 diagnosed cases of prediabetes whose insulin resistance and beta cell function were measured initially, at 3 months and at 6 months of yoga. Subjects were trained to perform Yoga in the hospital for 1 week under direct supervision of a trained yoga instructor and then allowed to do same for rest 3 weeks of month at home. Insulin resistance values and beta cell function were calculated by HOMA-IR and HOMA-β formula. Results: Insulin resistance was found to be reduced significantly at 3 months and at 6 months. Beta cell function was found to be decreased at 3 months and 6 months but not significantly. Conclusions: After yoga insulin resistance (calculated by HOMA-IR) was decreased significantly. Beta cell function also improved after yoga though initially declined in first three months, though change was non-significant. It can be safely concluded that yoga has an undoubted role in decreasing insulin resistance and hence has promising role in prevention of prediabetes to diabetes conversion.

Keywords : Yoga, Prediabetes, insulin resistance, beta cell function

PP-102

Serum Creatine Kinase and Lactate Dehydrogenase Activities in Patients with Hypothyroidism

Namita Jain, P.D.Sarkar,
S.Paneri, Rajeev Lohokare

Department of Biochemistry, M. G. M. Medical College Indore (M.P.)
Email id- drnamitamohit@gmail.com

OBJECTIVES : So many biochemical abnormalities have been documented in hypothyroidism,serum creatine kinase (CK) has become an important clinical marker for muscle damage. But only a few studies have documented serum lactate dehydrogenase (LDH) activity in patients with thyroid dysfunction. We have conducted this to determine the activities of serum creatine kinase (CK) and lactate deydrogenase (LDH) in hypothyroid patients, and to find out the relationship between CK, LDH and T4, and TSH levels. Methodology: Thyroid function tests, serum CK and LDH levels were obtained from newly diagnosed hypothyroid patients attending the Endocrinology Clinic at M.Y Hospital, Indore (M.P.) We included 20 patients with overt hypothyroidism; 40 patients with subclinical Hypothyroidism and 60 controls who did their annual routine tests.TSH and T4 were measured by radioimmunoassay and CK and LDH levels were measured by spectrophotometric method in fully automated analyzer. Results: Elevation of CK activity was found in 9 patients with overt hypothyroidism and in 14 patients with subclinical hypothyroidism. The elevation of LDH activity was found in 11 patients with overt hypothyroidism and in 35 patients with subclinical hypothyroidism. In the hypothyroid patients, a positive correlation was found between CK activity and TSH, and a negative correlation between CK activity and FT4 and between FT4 and TSH. Conclusion: The significant higher levels of CK and LDH activities indicates that these can be used as screening tools in hypothyroidism

Keywords : LDH, CK, hypothyroidism, Endocrinology

PP-103

Elucidation of Novel Biomarkers for PCOS and Studying In Relationship with Age Group of PCOS Affected Woman

Janvika Verma, Aparna Pandey

ITM vocational University, Vadodara

BACKGROUND : Polycystic Ovarian Syndrome (PCOS) is characterized by female infertility and metabolic abnormalities and is one of the most common endocrine disorders. PCOS is linked with increase in psychological distress in clinical populations. OBJECTIVE: To study the impact of PCOS on women psychology and elucidation of novel biomarker for improved diagnosis. METHODS: We have analysed about a group of 70 adolescents with an ethnically heterogeneous individuals, amongst them 25 were non-obese with PCOS, 25 were obese with PCOS, while 20 were as controls. Fasting levels of insulin, glucose, Androgen and AMH, luteinizing hormone and follicle-stimulating hormone were estimated using CLIA method and statistically validated RESULTS: In a selective effects model, the relative risk for cardio-metabolic disorder and impacts on HRQoL stroke were 2.02, as compared with women with PCOS to the women without PCOS. Pooling the two studies with risk estimates adjusted for metabolic disorder like diabetes showed a relative risk of 1.55. Moreover, the ANOVA analysis showed a 2-fold risk of cardio-metabolic disorder for patients with PCOS relative to women without PCOS. PCOS is well known multifaceted disease, impacting on various aspects of women's life, viz. aesthetics, metabolism, reproduction, sexuality and psychological well-being. The lean PCOS phenotypic woman has a high risk of misdiagnosis and under-diagnosis, with the overweight/obese phenotype. CONCLUSIONS: The above data shows that PCOS can be the unpredictable. While heterogeneity of the comorbidities, clinical appearances and outcomes, which affect woman during regenerative and post reproductive age that in turn influence on the individual implementation. Key Words: polycystic ovary syndrome, systematic review, arterial disease, obesity.

Keywords : polycystic ovary syndrome, systematic review, arterial disease, obesity.

PP-104

Assessment of Effect of Yoga on Fasting Blood Glucose and Post Prandial Blood Glucose in Prediabetics

Gaur S, Saini N, Rajput R**, Kharb S*

**Department of Biochemistry,*
***Department of Endocrinology, PGIMS Rohtak*
Email Id: shwetagaur21@gmail.com

OBJECTIVE : To assess effect of Yoga on fasting plasma glucose and post prandial plasma glucose in prediabetics. Methodology: The study was a cohort study carried out on 100 diagnosed cases of prediabetes whose fasting plasma glucose and post-prandial plasma glucose were measured initially, at 3 months and 6 months of yoga. Subjects were trained to perform Yoga in the hospital for 1 week under direct supervision of a trained yoga instructor and then allowed to do same for rest 3 weeks of month at home. Fasting plasma glucose was estimated and then participants were subjected to OGTT with 75g anhydrous glucose powder dissolved in 250-300 ml water which they were asked to consume over 5 minutes. Two hours post prandial plasma glucose was again tested by Glucose Oxidase method. Results: Fasting and post-prandial plasma glucose levels both were significantly reduced after 3 and 6 months of yoga as compared with levels prior to initiation of yoga. Conclusions: Favourable effect of yoga in reduction of fasting plasma glucose, plasma glucose after oral glucose was seen. It was concluded that yoga has a positive effect on reduction of plasma glucose levels and thus reducing chances of prediabetes to diabetes conversion.

Keywords : Yoga, prediabetes, Fasting glucose, post-prandial glucose

PP-105

Role of Glycated Fibrinogen in Type 2 Diabetes Mellitus

Shahida Perween*, Minhal Abidi,
Abul Faiz Faizy, Moinuddin

Department of Biochemistry, Jawaharlal Nehru Medical College, A.M.U., Aligarh, India
**shahida7a@gmail.com*

OBJECTIVE : To generate antibodies against native and methylglyoxal (MG) modified fibrinogen in experimental rabbits and to examine the binding of native and MG-fibrinogen with auto-antibodies in diabetic patient's sera by direct binding, inhibition-ELISA and gel-shift assay. To analyze the biophysical characteristic of isolated fibrinogen in type 2 diabetes mellitus (T2DM) patients. Methodology: In order to assess the likely role of MG-fibrinogen in the complications associated with T2DM (n=80), sera from these patients were analyzed for their binding to native fibrinogen and MG-fibrinogen on solid phase enzyme assays as well as by gel shift assay, competitive inhibition ELISA and binding studies on purified immunoglobulin G (IgG) in the immunological studies conducted on experimental rabbits. The conformational changes in isolated fibrinogen from T2DM patients were studied by UV absorption, fluorescence, FTIR and CD spectroscopy, ThT, Congo-red, SEM, TEM, confocal microscopy and ANS as compared to the healthy control groups. Results: The immune response in rabbits immunized with MG-modified fibrinogen and isolated IgG suggests a structural alteration in fibrinogen protein molecule. This would have been resulted into the generation of neo-epitopes and act as a foreign by rabbit's own immune system. The biophysical parameter shows the perturbation of secondary and tertiary structure of proteins in T2DM. Conclusion: The neo-epitopes on fibrinogen produced by its reaction with MG seem to be responsible for the production of high levels of antibodies and act as potential antigenic molecules for auto-immune response in diabetic patients which may be used as a potential biomarker for the disease diagnosis.

Keywords : antibodies, methylglyoxal, fibrinogen, neo-epitopes

PP-106

Evaluation of Prevalence and Pattern of Dyslipidemia and Fatty Liver in Type 2 Diabetic Patients in a Tertiary Care Hospital

Nabiha Mayanaz Karim, Barnali Thakur

Dept. of Biochemistry, Silchar Medical College and Hospital, Silchar, Assam -788014
Email: nabihamkarim@gmail.com

OBJECTIVES : 1. To measure the concentration of lipid profile parameters and presence of fatty liver in type 2 diabetic patients. 2. To study association of dyslipidaemia with its risk factors. Methodology: 100 adult patients with Type 2 diabetes mellitus were selected. Patients with history of significant alcohol intake/abuse, chronic liver disease, morbid obesity, tobacco smoking, history of alternative medicine intake were excluded. Fasting sample of blood was collected for lipid profile, HbA1c, HbsAg and Anti Hbc. Liver USG was performed for all to detect the presence of fatty liver. Results: 66% patients were found to have dyslipidaemia defined as abnormality in either LDL-C, HDL-C, total cholesterol or triglyceride. Increased LDL-C and total cholesterol were the most common abnormalities found. 54% of the patients had fatty liver on USG. Increased waist circumference, diastolic blood pressure and HbA1c were the risk factors strongly associated with dyslipidaemia. Conclusion: Abnormalities of lipid profile and fatty liver are highly prevalent among individuals with Type 2 diabetes mellitus despite ongoing therapy. Very few patients have well-controlled diabetes owing to the poor compliance with therapy, irregular follow-up among other factors. These abnormalities are the consequence of the insulin resistant state and increase the risk of cardiovascular morbidity. Conflict of interest: None.

Keywords : Dyslipidemia, Diabetes, Lipid

PP-107

Modification of Chitosan Impressively Heals Dermal Wounds in Diabetic Wistar Rats: Old turns to Gold

Sachin Shetty, Anushree U, Pratik Punj, Vasumathi Ramesh, Sanjay Bharati*

Department of Nuclear Medicine, Manipal College of Health Professions, Manipal Academy of Higher Education, Manipal (576104), Karnataka, India.

Wound healing is a dynamic process involving series of processes such as hemostasis, inflammatory phase, proliferative phase and remodeling or maturation phase. All these phases are well organized in normal conditions, whereas in the case of diabetes mellitus wound healing does not progress through these phases. There is delayed influx of inflammatory cells, delayed deposition of the collagen, delayed angiogenesis and impaired granulation tissue formation in the wound site. Chitosan, a polysaccharide and deacetylated product of chitin is long back known to be an effective multipotent wound healer. However, limitations such as low solubility, high molecular weight are a concern for its effective usage. In the present study, chitosan has been modified by phosphorylation (PC) with improved properties and enhanced biological activities required for effective healing of the wounds. PC was chemically characterized using Fourier transform infrared spectroscopy, Nuclear magnetic resonance spectroscopy, elemental analysis and LC-MS. Further PC was assessed for its dermal wound healing properties in streptozotocin induced diabetic male wistar rats. Modification of chitosan enhanced the solubility and antioxidant properties. Improvement in the wound healing parameters such as rate of wound contraction, hexosamine and hydroxyl proline content was also noted. Histological studies such as H & E for morphological changes of the wound and Masson's Trichrome for the collagen content of PC treated group were also suggestive of effective wound healing. Overall, PC can be potent wound healer with improved properties.

Keywords : Chitosan, Diabetes mellitus, Wound healing

PP-108

Effect of Single Bout of Moderate Exercise on Vitamin D Levels in Healthy Premenopausal Female Volunteers

Meenakshi Kaushik*, Manju Bala Pahwa*, Ramesh Verma**

*Department of Biochemistry*and Department of Community Medicine***
Pt. B.D. Sharma PGIMS, Rohtak-124001

OBJECTIVE : To study the effect of moderate exercise on vitamin D levels in healthy female volunteers METHODOLOGY The present study was conducted in the Department of Biochemistry Pt BD Sharma PGIMS, Rohtak in association with the Department of Community medicine. Thirty volunteer females of age group 20-50 years of hospital staff were taken up in the study. After proper informed written consent, first blood sample was withdrawn before exercise in red plain vacutainer under aseptic precautions. After 15 minutes of rest, they performed walking for 30 minutes. Second and third blood samples were collected after one hour and 24 hours of the exercise respectively. Samples for vitamin D were stored at -200C, till batch analysis and were estimated by using 25(OH) vitamin D total RIA kit. RESULTS The mean value of serum vitamin D fifteen minutes before exercise was 25.45±5.96 ng/mL, one hour after exercise was 27.11±6.04 ng/mL and twenty four hours after exercise was 26.80±5.85 ng/mL. The difference was statistically non significant with p=0.519 by using multi-group statistical analysis (ANOVA). CONCLUSION The alteration in serum vitamin D levels was statistically non-significant. Single bout of moderate exercise does not significantly effect serum vitamin D levels in healthy premenopausal female population. KeyWords: Vitamin D, Premenopausal women, Exercise

Keywords : Vitamin D, Premenopausal, Exercise, female

PP-109

Assessment of Serum High-sensitivity C-reactive Protein in Subclinical Hypothyroidism

Kustubh, Rajeev lohkare, Poornima Dey Sarkar, Rohit Manyal, Jaya Patel

Email:kaustubhsingh356@yahoo.com

OBJECTIVES : 1. To assess the difference between high-sensitivity C-reactive protein (hsCRP) in subclinical hypo- thyroidism (SCH) and controls. 2. To find an association between hsCRP and thyroid-stimulating hormone (TSH) in SCH. Methodology: The study was carried out in the Department of Biochemistry and Department of General Medicine, MGM Medical College Indore MP. In this study we selected total 120 subjects, which included 60 cases of SCH and 60 controls with general thyroid status. After taken informed consent from study participants attending OPD in Medicine Department, we took blood samples. Sample was analyzed in Biochemistry Lab. Analysis was done for thyroid hormones and hsCRP. Appropriate statistical test was applied. Results: The mean TSH levels were significantly elevated in SCH when compared with controls ($p < 0.0001$). Significantly elevated hsCRP was observed in SCH when compared with controls ($p < 0.0001$). Conclusion: Elevated levels of hsCRP in SCH suggest inflammation as a possible factor for linking SCH and CVD. Progression to overt hypothyroidism and cardiovascular risk are the major implication of SCH. Apart from inflammatory marker hsCRP is also a stimulator of inflammation and predictor of CVD. The hsCRP indicates the cardiovascular risk associated with SCH. Hence, it can be used to screen SCH patients who are at a risk of developing CVD.

Keywords : hs CRP, hypothyroidism, CVD, inflammatory marker

PP-110

Serum Ferritin is an Early Indicator of Insulin Resistance in Prediabetes

Aluguballi Sreenivas Reddy*[1], Meera shivasekar[2], V.M.Vinodhini[1], J.S Kumar[4]

[1]Department of Biochemistry, [2]Department of General Medicine, SRM Medical College Hospital and Research Centre, SRM Institute of Science and Technology, SRM Nagar, Kattankulathur-603203, Kanchipuram, Chennai, Tamil Nadu, India.
Email: sreeniva@srmist.edu.in

Introduction: Serum ferritin, a marker of iron stores has been implicated to play a role in many acute and chronic disease conditions. Several epidemiological studies have reported excess deposition of iron in tissues related to insulin resistance (IR). Aim & Objective: The aim of this study is to investigate the risk of iron stores as assessed by Serum ferritin to see where it could be an early indicator of insulin resistance in Pre-diabetes. Material and Methods: This case control study comprised of 112 Pre-Diabetic individuals who attended the OP Department of General Medicine and matched with 112 normal healthy individuals who attended the Master health checkup OP in SRM MCH & RC. Statistical Bivariate correlation analysis was performed between cases and controls by SPSS IBM social software. Results: Serum Ferritin (110.39 ± 13.52), Serum Iron (113.32 ± 14.81), %TS (32.18 ± 6.24), Serum Insulin (17.04 ± 1.89) and HOMA-IR (4.98 ± 0.77) were significantly high in Pre-Diabetics when compared with controls Serum Ferritin (43.46 ± 9.26), Serum Iron (70.02 ± 6.79), %TS (18.79 ± 3.04), Serum Insulin (8.02 ± 1.86) and HOMA-IR (1.71 ± 0.59). Similarly we found a significant positive correlation between Ferritin and Insulin ($r = .956^{**}$, $P = <0.001$) in Pre-Diabetics and controls. Conclusion: Serum ferritin levels were positively associated with serum insulin and HOMA-IR in individuals with Pre-Diabetes, suggesting increased serum ferritin could be an early indicator of IR in Pre-Diabetes.

Keywords : Prediabetes, Ferritin, Insulinresistance

PP-111

Effect of Diabetes mellitus Tyype 2 on Sex Hormones Profile of Indian Men

Sandeep Kumar[1], Jaya Jain[2]

[1]*Hind Institute of Medical Sciences, Sitapur*
[2]*Index Medical College, Indore*

Background : Diabetes mellitus is a metabolic disorder with characteristics of hyperglycemia and insufficiency of secretion or action of endogenous insulin. It is one of the largest global health emergencies of the 21st century. Approximately one-third of men with obesity, type 2 diabetes, or metabolic syndrome have subnormal free testosterone concentration which is inversely related to BMI and insulin resistance. In comparison with the developed countries, few research on effect of diabetes mellitus type 2 with sex hormone profile of Indian males has been done. Also, these studies did not report testosterone concentrations in association with luteinizing hormone (LH) and follicle-stimulating hormone (FSH) concentrations in men with type 2 diabetes. Diabetes and the metabolic syndrome can be risk factors for hypogonadism, hence, testing the circulating testosterone is strongly recommended in patients with type 2 DM Objective: To estimate the serum levels of Testosterone, LH and FSH in diabetic patients and non-diabetic healthy controls. Materials and Methods: blood samples of 181 diabetic patients and 181 non-diabetic healthy controls were collected and serum Testosterone, LH and FSH levels were accessed using ELISA Kits. Results: Diabetic patients have lower sex hormones level as compared to non-diabetic healthy controls. Conclusion: Type 2 diabetes mellitus has been associated with a lower level of sex hormones which may be a risk factor for hypogonadism in diabetic men, hence accessing sex hormones levels of diabetic men helps in further diagnosis of hypogonadism in these men.

Keywords : Type 2 Diabetes Mellitus, serum testosterone, serum LH, serum FSH

PP-112

Improved Therapeutic Potential of Chrysin Nanoparticles Against Diabetes: An *in vitro* Study

Asimah Khalid and Imrana Naseem*

Department of Biochemistry, Faculty of Life Sciences, Aligarh Muslim University, Aligarh, Uttar Pradesh, India, 202002

Chrysin is a well-known flavonoid possessing variety of therapeutic benefits and showing antioxidant, anti-inflammatory, anti-diabetic and other such properties. However, its proper application is hindered because of its poor solubility and poor bioavailability. To overcome these limiting factors, nanotization appears to be a promising method to improve the therapeutic efficacy of the molecule. Here, we have prepared the nanoformulation of chrysin by solvent-evaporation method and characterized them. The antioxidant potential was determined and in vitro anti-diabetic activity was assessed by α -amylase and alpha-glucosidase inhibition assays and the results showed a dose-dependent increase in percentage inhibition of the enzyme by the nanoparticles compared to their soluble forms. Glycation was reduced to a significantly higher extent in presence of nano chrysin and this was observed by a decrease in synthesis of amadori products as well as advanced glycation end products (AGEs). This effect was also evident by estimating free thiol and carbonyl contents. The results were further confirmed by spectroscopic techniques showing interaction of HSA with chrysin in both nano as well as soluble forms. All these results suggest that the nanoformulation of chrysin possess significantly greater antioxidant, antidiabetic and antiglycating activities than soluble form. The experimental outcomes were supported by molecular docking studies.

Keywords : Flavonoids, Chrysin nanoparticles, Diabetes, Glycation

PP-113

Role of MicroRNAs in Hepatitis C

Kaur Navneet[1], Goyal Gitanjali[1],
Garg Ravinder[2], Tapasvi Chaitnya[3]

[1]Department of Biochemistry, [2]Department of Medicine, [3]Department of Radiodiagnosis
GGSMCH, Faridkot

Hepatitis C virus (HCV) belongs to the Flaviviridae family, and differs from other families based on the genome organization. The HCV is a single-stranded and positive-sense RNA virus and composed of about 9,600 nucleotides in their length. HCV is transmitted through the HCV contaminated blood and their products, medical procedures and injectable drug use. Currently, there is no vaccine for the infection. Although it is a short term condition, but it is estimated that 85% of those infected will develop chronicity. The mechanisms which underlie the liver injury are constantly reconsidered as studies are done from time to time. Hepatitis C virus modulates the signaling and metabolic pathways of the viral proteins. It also induce the antiviral immune response of the host, which then leads to inflammation of the liver. MicroRNAs (miRNAs) are considered crucial in the development of various liver diseases including HCV. These are small non-coding strands of RNA, responsible for the regulation of the expression of genes after the transcription process. The miRNA is responsible for the pathogenesis of HCV infection and the immunologic response of the host following an infection. HCV infection leads to massive dysregulation of the host's miRNA, which could positively or negatively regulate the life cycle via targeting the genes or genomes linked to the cellular signaling pathways. There is a hope that with the knowledge of miRNA, novel drugs for the management of HCV infection can be developed.

Keywords : HCV, MICRORNA, LIVER, HEPATITIS

PP-114

Study of Correlation between Serum Sodium Levels and Severity of Chronic Liver Disease

Nalini P S

Coimbatore Medical College, Coimbatore
Email ID: drnalini20@gmail.com

Background : Chronic liver disease is a progressive deterioration of liver functions which includes process of inflammation, destruction and regeneration of liver parenchyma leading to fibrosis and cirrhosis. Sodium balance is vital for cellular function. An imbalance in the regulation of total body water leads to abnormal serum sodium levels. Chronic liver disease is associated with water and electrolyte imbalance. In Chronic liver disease, splanchnic vasodilatation leads to arterial underfilling which unloads high pressure baroreceptors that stimulates non-osmotic hypersecretion of Arginine vasopressin, leading to solute free water retention and dilutional hyponatremia. Aim: To study serum Sodium levels in Chronic liver disease cases. Materials and Methodology: A case control study conducted in Coimbatore medical college hospital. Chronic liver disease patients with complications were taken as cases and Chronic liver disease patients without complications were taken as controls. Serum sodium levels were estimated in both these groups and compared. Results: The study showed significant negative correlation between serum sodium levels and Chronic liver disease with complications cases with p value <0.001 which was statistically significant. Conclusion: Low serum sodium levels are associated with the pathophysiology of complicated chronic liver disease.

Keywords : chronic liver disease, cirrhosis, serum sodium, Hyponatremia

P-115

Changes in Liver Function Parameters in Patients with COVID-19 admitted in Tertiary Care Hospital: RIMS Hospital

Sangeeta Naorem

Department of Biochemistry, Regional institute of Medical Sciences (RIMS) Imphal
Email:drsangeetan@gmail.com

Background : COVID-19 outbreak caused by SARS-COV-2 which primarily targets lungs causing other organs dysfunction including liver have been reported .However studies on liver function in COVID 19 patients are limited. Hence, this study aimed to evaluate the Liver enzymes in COVID-19 cases admitted in RIMS, Imphal. Methodology: We performed a cross sectional study on the liver function parameters of 488 COVID-19 positive patients admitted in RIMS, Imphal during April 2020 to September 2020. The COVID-19 positivity was determined on basis of RNA real time PCR. Serum samples were analyzed using Randox Auto analyzer. Results: Out of 488 patients with COVID-19, 431cases (88.32%) had abnormal LFTs and 57 cases (11.68%) had normal LFTs. Out of these 431 cases 330 (76.57%) were males and 101 (23.43%) were females. Median age of abnormal LFTs cases was 35 years. The primary liver enzymes; AST, ALT, ALKP and GGT were found to be elevated in 79.3%, 78.1%, 30.8% and 25.5% cases respectively. However, serum albumin levels were low in 24.1% cases. Conclusion: The prevalence of abnormal LFTs in COVID-19 patients is relatively high (88.31%).Abnormal liver enzymes may be a frequent finding in COVID-19 cases. These patients may be at a higher risk of progressing to severe diseases and therefore they should be observed and evaluated frequently for further treatment.

Keywords : Albumin, ALT, AST, ALKP, GGT

PP-116

NAFLD & Alanine Transaminase: A Correlation Study from Tertiary Care Center in South India

Francy Louis T[1], Pamala John[2], Presthiena Lofi E L[1], P R Varghese[1]

[1]*Jubilee Mission Medical College & Research Institute (JMMC&RI), Thrissur,*

[2]*Department of Microbiology, ESIC MCH, Hyderabad & Former Research Assistant, Jubilee Centre for Medical Research (JCMR), JMMC&RI, Thrissur*
E-mail ID: pamalajn@gmail.com

Introduction Nonalcoholic fatty liver disease (NAFLD) is the accumulation of fat (steatosis) in the liver for reasons other than excess alcohol intake. It is emerging as an important cause of liver disease in India. The prevalence of NAFLD in India is around 9-32% in general population of India. It is a distinct hepatic condition and one of the most common causes of chronic liver disease globally. It is predicted to become the leading cause of cirrhosis requiring liver transplantation in the next decade. Objective: The study is aimed to explore the correlation between ALT and other liver function parameters in NAFLD patients. Methodology: The study is a cross sectional retrospective survey based on patient data from a tertiary care Centre in south India. The demographic data along with other clinical history and laboratory parameters were collected from medical records of 173 patients who attended the tertiary care center during 2013. The Serum ALT level of patients was tested for association with demographic variables and correlation with other biochemical indicators in the study. Result & Conclusion: Significant positive correlation of serum AST with total bilirubin, direct bilirubin and alkaline phosphatase and negative correlation with serum protein was observed in the study. The study concludes that early profiling of serum ALT and it`s covariates may help to diagnose NAFLD at an early stage.

Keywords : Fatty Liver, Biochemical Markers, Non-alcoholic Fatty Liver Disease, Liver enzymes

PP-117

Molecular Characterization of Hemaggluinin gene from Positive Samples of Influenza A (H1N1) pdm09 Viruses from Patients Referring to Tertiary Care Hospital Central India

Arshi Siddiqui[1,3]*, Ashish Kumar Yadav[1], Ram Kumar Nema[2], Debasis Biswas[2], Roji Begum[1], Jagat R Kanwar[1], Nidhi Tripathi[3], Anil Prakash[3] and Rashmi Chowdhary[1]

[1]Department of Biochemistry, [2]Department of Microbiology,

All India Institute of Medical Sciences (AIIMS), Bhopal, Madhya Pradesh, India

[3]Department of Biotechnology, Barkatullah University, Bhopal, Madhya Pradesh, India
Email: rashmi.biochemistry@aiimsbhopal.edu.in

Objectives : Hemagglutinin is a key surface glycoprotein protein of Influenza A (H1N1)2009 that varies often and is the target of about 60% of antibodies. Molecular monitoring is an important tool for managing epidemics. In human throat samples, the HA1 gene of Influenza A (H1N1)2009 was investigated for molecular characterization. Methodology: We used two-step RT PCR to amplify the HA1 gene from positive throat swab samples of the Influenza A (H1N1)2009 virus acquired in 2019. The amplified product was sequenced using the Sanger Sequencing Method. All of the sequences were aligned using BLAST. The Maximum Likelihood Method was used to build the phylogenetic tree. The amino acid changes were detected by matching sequences with the vaccine strain using MUSCLE in MEGA X software. Results: All of the samples were amplified, resulting in a 1 kb HA1 band. A product of 950 base pairs was sequenced. Phylogenetic analysis indicated that the samples belonged to Genogroup 6B. When compared to the vaccine strain, the mutational study found amino acid alterations. Conclusion: There have been reports that antigenic drift is associated with increased pathogenicity of H1N1 influenza virus, which correlates with the current study of circulating H1N1 virus in the area; will contribute to the design of vaccines or/developing diagnostic methods, and will help to plan any interventional H1N1virus control strategies

Keywords : Influenza A (H1N1)2009, Hemaggluinin, Genogroup 6B, Central India

PP-118

Circulating MicroRNAs as Diagnostic Biomarkers of Ovarian Cancer

Chawla Sonia[1], Goyal Gitanjali[1], Bhatti Seema[2], Sarita[3]

[1]Department of Biochemistry, [2]Department of Obstretics and Gynaecology, [3]Department of Pathology, GGSMCH, Faridkot

Ovarian cancer is characterized as deadly amid cancers of women. The reason for the raised fatality rate is asymptomatic and quiet nature of development of ovarian cancer particularly in early stages. Absence of relevant markers for diagnosing the disease in initial stages also adds up to the burden. There is critical need for improved diagnostic approaches for detection at initial stage where the disease is relatively manageable. MicroRNA (miRNA), a class of single stranded, non-coding RNA of length 19-25 nucleotides are currently being researched for early diagnosis of ovarian Cancer. miRNAs regulate expression of approximately more than half of the protein coding genes. They post-transcriptionally modulate expression of selected genes by binding to 3'- untranslated region of their mRNA. They are related with various aspects of oncogenesis such as development, metastasis, intrusion, angiogenesis and apoptosis by acting as modulators of growth factors, boosters of epithelial to mesenchymal transition, modulators of extracellular matrix and inhibitors of apoptosis etc. In this way, behave as supporters or suppressors of ovarian carcinoma. Dysregulation of microRNA is focal point of ovarian carcinogenesis. Deregulation is result of different mechanisms like chromosomal variations including deletion, insertion and amplification of miRNA genes. Loss of heterozygosity, epigenetic alterations also contribute to the same. microRNA can prove as better diagnostic marker than conventional protein biomarkers as they will display change before a protein marker and are stable in general circulation. The upregulated or down regulated expression of miRNAs can aid in differentiation of women with ovarian cancer from healthy subjects

Keywords : microRNA, Cancer, Ovary, Genes

PP-119

Study of C677T MTHFR Gene Polymorphism as a Risk Factor for NTDs

Manjulata Kumawat[1], Anjalika Goyal[1], Dhara[2], P.S. Gill[3], Ishwar Singh[4], Meenakshi Vashist[5]

[1]*Department of Biochemistry,* [2]*Department of Biotechnology,* [3]*Department of Microbiology,*

[4]*Department of Neurosurgery, PGIMS, Rohtak*

[5]*Department of Genetics, MDU, Rohtak*

INTRODUCTION : Various genetic and environmental factors contribute to development of neural tube defects (NTDs) which are a group of neurulation defects resulting from failure of closure of embryonic neural tube. Among genetic factors is polymorphism in methylenetetrahydrofolatereductase (MTHFR) gene, giving rise to a gene variant or mutant. Material & Methods: Forty diagnosed cases of NTDs and forty healthy individuals were investigated in a case control study for presence of C677T MTHFR gene polymorphism. Serum folate and Vitamin B12 levels were estimated and MTHFR gene polymorphism was detected by Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP). RESULTS: It was found that in cases thirty-two were homozygous with CC genotype and eight were heterozygous with CT genotype while in controls thirty five had CC genotype and five had CT genotype. TT genotype was absent in both the groups. There was no statistically significant difference between both the groups. CONCLUSION: Although there was no evidence of association between MTHFR C677T polymorphism and NTDs but our study doesn't rule out the impact of MTHFR gene mutation on folate metabolism. The reason for absence of TT genotype and no association could be a small sample size. Larger, comprehensive and well designed multi-centric but feasible studies involving proper subjects and appropriate and adequate controls from several hospitals may provide more meaningful data.

Keywords : MTHFR, neural tube defect, polymorphism, allel

PP-120

Interleukin-22-A Potential Diagnostic Biomarker in Tuberculosis

Shruti Gupta[1], Kavya Gauba[1], Prasenjit Mitra[2], Mithu Banerjee[1], Dhramveer Yadav[1], Praveen Sharma[1]

Department of Biochemistry,
[1]*All India Institute of Medical Sciences, Jodhpur, India*
[2]*PGIMER, Chandigarh, India*
Email ID: drshrutiga@gmail.com

INTRODUCTION : Disease progression of Tuberculosis (TB) is determined mainly by the balance between the microorganism and the host defense systems. T cell-mediated immune response begins after dissemination of Mycobacterium tuberculosis in the body and many distinct types of T helper cells are present at the site of infection. Interleukin-22 (IL-22) helps in cell proliferation, regeneration, and provides protection against microbial diseases. IL-22 producing T cells can migrate into the granulomas during TB infection. However, disparity exists in literature regarding its role. Objectives: To assess serum IL-22 levels in TB patients and compare them with healthy controls. Methodology: 80 sputum positive TB patients and 80 apparently healthy subjects were enrolled in the study taking into account the exclusion and inclusion criteria. After obtaining due informed consent, 5mL venous blood was withdrawn in plain vacutainer from all participants enrolled. Serum IL-22 levels were estimated using Human IL-22 GENLISA™ ELISA kit (Krishgen BioSystems, India). Statistical analysis was performed using SPSS. Results: The median (IQR) of serum IL-22 was significantly lower in TB patients compared to controls (18.55 (5.08) vs 49.38 (162.88) pg/mL); $p<0.0001$). On ROC analysis, IL-22 discriminated TB patients from healthy controls at 21.67 pg/mL with a sensitivity and specificity of 82% and 82% respectively and an AUC of 0.904. Conclusions: IL-22 is crucial for the modulation of tissues in response to TB infection and its levels are found to be significantly decreased in patients. It can be evaluated as a potential biomarker for diagnosing TB.

Keywords : Tuberculosis, Interleukin-22, Mycobacteria, Biomarker

PP-121

A Shift in the Etiological Profile of Hepatocellular Carcinoma in South India

Shilpa Cheerngod[1], Kavitha Karunakaran[2], Prasad Varamballi[2], Balaji Musunuri[1], Shiran Shetty*[1]

[1]*Department of Gastroenterology and Hepatology, Kasturba Medical College*

[2]*Manipal Institute of Virology,*

Manipal Academy of Higher Education (Deemed to be University), Manipal-576104, Karnataka, India
**Corresponding author*

Background : The data on the underlying etiologies of hepatocellular carcinoma is very limited from South India. Objective: To identify the causes of underlying liver diseases among hepatocellular carcinoma cases during a three-year period. Methods: A retrospective medical records review was done to collect the data of the patients who attended the gastroenterology OPD clinic from January 2016 to December 2018 and analyzed the etiologies, demographic data, and clinical parameters. Results: The median age of the HCC cases was 62.67 ±9.14 years with a male preponderance. Out of the 103 HCC cases, Hepatitis B virus (HBV) associated cirrhosis was found among 25.2% of cases and alcoholic cirrhosis among 30% of the cases. Most of the patients were ⩾ 61 years of age (66.4%). The prevalence of cryptogenic (33.9%) and alcoholic cirrhosis was found to be high compared to HBV cirrhosis, which may suggest that there is a requisite for appraising cryptogenic cirrhosis along with the other causes of HCC. HBV infection was observed significantly high among 41-60 years of age. Conclusion: Cryptogenic cirrhosis was found to be the underlying cause of HCC among most cases. Hence there is a need for implementing regular screenings which can enhance the surveillance and proper management of HCC since the diagnosis occurs during an advanced stage thus leading to shorter survival rates due to limited treatment. Additional studies to determine the underlying causes of cryptogenic liver disease should be carried out, which makes it easier to restrain the disease progression at the early stage.

Keywords: Hepatitis B Virus; Hepatocellular carcinoma; Cirrhosis; NAFLD; Hepatitis C Virus

PP-122

Role of Neuroinflammatory Markers in Dementia

Rachna Agarwal, Abhishek Khatri, Chandra Bhushan Tripathi, Omprakash

Institute of Human Behavior & Allied Sciences, New Delhi

Background : Cognitive decline in dementia is associated with cytokine dysregulation. Neuroinflammation acts as independent pathological factor in early preclinical stages of Alzheimer's disease. Interleukin-6 (IL-6) and C-reactive protein (CRP) have been most widely studied in population, showing IL-6 and CRP associated with high rates of cognitive decline. Material & Methods: A cross sectional study was done in Institute of Human Behavior & Allied Sciences, New Delhi. 66 Dementia patients with average age of 69 ± 0.06 years, 44 patients with AD and 22 patients with vascular dementia were included in the study. All subjects underwent estimation of Interleukin-6 (IL-6), C-Reactive Protein (CRP) and albumin along with routine laboratory tests in serum. Results: Age was having significant but weak negative correlation with HMSE score, whereas duration of illness was strongly but inversely related with HMSE. IL 6, CRP and serum albumin levels had almost non-existent strength of relationship with age. The duration of illness had strong, positive and statistically significant relationship with IL 6, but CRP was moderately correlated. The relationship between HMSE score, a measure of cognitive decline, and level of inflammatory markers (including IL-6, CRP and albumin) after eliminating the effect of major confounders age & duration of illness showed moderately negative but statistically significant correlation between HMSE and IL-6. No relation could be elicited between HMSE and CRP and Albumin. Conclusion: IL6 can be important inflammatory biomarker for monitoring the progress of disease and therapeutic intervention.

Keywords : Dementia, Inflammatory-markers, IL-6, CRP

PP-124

Evaluation of Apo A IV and Haptoglobin as Potential CSF Markers in Patients with Guillain-Barre´ Syndrome: A Cross Sectional Study

Rajlaxmi Tiwari[1], Gautom Kumar Saharia[1], Sanjeev Kumar Bhoi[2], Manaswini Mangaraj[1]

[1]Department of Biochemistry,[2] Department of Neurology AIIMS, Bhubaneswar, Odisha-751019, India.

Background : Brain and blood derived protein analysis in various studies done abroad found that some proteins and their isoforms in CSF were significantly altered in Guillain-Barre´ Syndrome (GBS) patients compared with controls. But data is lacking in India with respect to the blood or brain derived proteins in patients of GBS. Objective: This study aimed to identify the role of Apo A IV and haptoglobin as potential protein markers in CSF of patients with GBS in our population. Materials and Methods: This study comprised of 28 participants where 12 confirmed cases of GBS and 16 control subjects admitted for non-infectious neurological disorders were recruited. CSF glucose, protein and ADA were analysed in autoanalyser. Concentration of Apo A IV and haptoglobin were estimated with ELISA kits. Results: The CSF glucose and protein concentration of cases were higher as compared to controls, but the difference was found to be non-significant. The concentration of Haptoglobin and Apo A IV was higher in the confirmed cases of GBS as compared to the control subjects and this difference was found to be significant. The ROC curve analysis for Haptoglobin revealed that the area under curve (AUC) was 0.867 (95% CI: 0.732 – 1.001), with a sensitivity of 83.8% and specificity of 63.3%. The AUC for Apo A IV was 0.883 (95% CI: 0.758 – 1.009), with a sensitivity of 91.7% and specificity of 73.3%. Conclusions: Haptoglobin along with Apolipoprotein A IV can emerge as potential biochemical markers in CSF for diagnosis of GBS.

Keywords : Apo A IV, Haptoglobin, Guillain-Barre´ syndrome, GBS, CSF markers.

PP-125

A Linear Analysis of Maternal and Neonatal Factors Influencing Newborn TSH Level- An Observational Study

Verma NR[a], Naik G[b], Patel S[c], Padhi Pd, Naik T[d], Nanda R[c]

[a]Department of Biochemistry, Pt. Jawaharlal Nehru Memorial Medical College, Raipur, Chhattisgarh

[b]Department of Community and Family Medicine, [c]Department of Biochemistry,

[d]Department of Pediatrics,

All India Institute of Medical Sciences, Raipur, Chhattisgarh

Background : Thyroid hormones are essential for fetal growth and the central nervous system development. Thyroid-stimulating hormone (TSH) is the key regulatory hormone. Their levels are quite dynamic in the perinatal period and are influenced by multiple factors. These factors should be taken into consideration during new-born screening. Aim & Objective: This study aimed to observe the impact of maternal and neonatal factors on neonatal TSH (nTSH) status. Results: newborn TSH depicted a positive correlation with maternal age (p=0.457), parity (p=0.066) while negative correlation recorded with maternal blood haemoglobin (p=0.007) and ANC visit (p=0.066) among maternal factors. New-born length (p=0.027), head circumference (p=0.978), and birth weight (p<0.001) and gestational age (p=0.156) exhibited a negative correlation with nTSH among neonatal factors. Conclusions: This study concludes that among all the maternal and neonatal factors, birth weight shows the most influence on nTSH. However, the effect may be compounded by other factors. As these exposures rarely occur singly, it is often difficult to find the exposure which confers the risk on children. These factors should be considered while interpreting the result of the screening program.

Keywords : nTSH, newborn screening, regression analysis, maternal and neonatal factors

PP-126

Association of Atherogenic Index and Triglyceride Glucose Index with Insulin Resistance in Overweight and Obese Children

Ankanksha*, Ashuma Sachdeva*, Kapil Bhalla**

**Dept of Biochemistry, **Dept of Paediatrics, Pt. B. D. Sharma PGIMS, Rohtak*
Email: ankankshadureja@gmail.com

Background : Insulin resistance is based on findings that includes hyper glycemia, dyslipidemia, abdominal obesity and hypertension. Atherogenic index of plasma is composed of triglyceride and high-density lipoprotein cholesterol which shows association with obesity. Triglyceride glucose (TyG) index is a log transformed product of fasting triglycerides and fasting glucose. It has been found that individuals with elevated TyG Index and increased level of TG: HDL-C ratio has significant increase in insulin level. OBJECTIVE To review the literature on correlation between triglyceride glucose index and atherogenic index with insulin resistance in obese and overweight children and adolescents. METHODOLOGY Different databases like European journal of paediatrics, J paediatric metab, PubMed etc. were searched for articles reporting studies on association of atherogenic index and triglyceride glucose index with insulin resistance in overweight and obese children. These articles were compared. RESULTS and CONCLUSION After review of literature, it has been concluded that atherogenic index and triglyceride glucose index are positively associated with insulin resistance in obese and overweight children and adolescents.

Keywords : Insulin, Obesity, Triglycerides, Atherogenic.

PP-127

Screening of Oximolysis of Ester Substrate: A Step towards Finding of Ester Substrate for Erythrocyte Cholinesterase with Minimal Oximolysis

Sukhpreet Singh*, Sheemona Chowdhary, Deepak Kumar, Rajasri Bhattacharyya, Dibyajyoti Banerjee**

Department of Experimental Medicine and Biotechnology, PGIMER, Chandigarh 160012
**presenting author: sukhpreet4827@gmail.com*
*** corresponding author: dibyajyoti5200@yahoo.co.in*

Reactivation based methods are yet to be popularized for the detection of erythrocyte cholinesterase activity. It is in this context that we must grade the ester substrates as per their oximolysis profile. Objective: To study the oximolysis of several ester substrates Methods: In silico and in-vitro studies are employed to know the oximolysis profile of several ester substrates. Result: It is observed that the oximolysis profile differs with different ester substrates. Conclusion: The reactivation based method of cholinesterase detection can be devised with ester substrate with minimal oximolysis.

PP-128

Correlation of Ferritin Levels with Thyroid Hormones in Hypothyroid Patients at Tertiary Care Hospital

Nisha Jha, Ravi Shekhar, Rekha Kumari

Department of Biochemistry, Indira Gandhi Institute Of Medical Sciences, Patna.
E-mail: dr.nishajha7@gmail.com

INTRODUCTION : Thyroid gland produces thyroid hormones and it plays a vital role in human body. An enzyme thyroid peroxidase which is an iron containing enzyme is very much essential enzyme for first two steps of thyroid hormone synthesis. S. ferritin an iron storage protein present in all the cells, there is altered level of s.ferritin in patients with thyroid disease. Objective : The objective of our study is to determine and assess the correlation between levels of s.ferritin and thyroid

hormones TSH, fT3 and fT4 among hypothyroid patients. Methodology : A cross sectional study was conducted on 100 hypothyroidism patients. Thyroid Stimulating Hormone (TSH), Free Thyroxin (fT4), Free Tri-iodothyronine (fT3) and serum ferritin levels were measured in Architect Abott i2000 fully automated analyzer works on the principle of CMIA (Chemiluminescent Microparticle - immunoassay). Results and conclusions : ON GOING.

Keywords : Keywords: TSH, fT3, fT4, s.Ferritin

PP-129

Screening of Specific Small Molecule Inhibitors for Malate Dehydrogenase Using High Performance Computing Infrastructure: Autodock Vina and GOLD

Bharti Thakur*, Deepak Yadav,
Dibyajyoti Banerjee and Rajashri Bhattacharya

Department of Experimental Medicine & Biotechnology, PGIMER, Chandigarh, India
Email ID: thakurbharti272@gmail.com

INTRODUCTION : Malate dehydrogenase (MDH) is a group of multimeric enzymes characteristically self-organised as dimers or tetramers and reversibly catalyses the oxidation of malate into oxaloacetate using NAD+ /NADH as cofactor systems. Functional significance of MDH enzyme in human has been elucidated in earlier studies, but the rationale to screen potent MDH inhibitor was to explore these inhibitors as therapeutic agents or biomarkers in various diseases and medical emergencies such as colorectal cancer and prostate cancer. Thus, we explored a number of small molecules as significant MDH inhibitors by using various virtual screening tools which could be further exploited for assay or drug development. Objective: To explore the high performance computing infrastructure Autodock Vina and GOLD for studying the interactions between human MDH protein and small molecule inhibitors. Methodology: In silico analysis was performed for different inhibitors and human MDH protein using Autodock Vina and GOLD. Results: Autodock Vina was significantly explored to predict the protein-ligand confirmation with highest binding affinity. These confirmations were further validated via GOLD by identifying the correct binding mode of active molecules in a protein ligand complex. Conclusions: Small molecule inhibitors with highest protein ligand affinity and confident binding mode predictions were screened.

Keywords: Malate dehydrogenase, Toxicity, Autodock Vina, GOLD

PP-130

Role of IQC and EQAS in Clinical Laboratory

Raju Ram, Badri Lal Jat, Sanghapriya Mukherjee,
Aparajita Kushwaha, Saumya Soni,
Neha Sharma, Ashish Sharma

Department of Biochemistry, Geetanjali Medical College and Hospital, Udaipur, Rajasthan.
Email: ram853771@gmail.com

Objective : The aim of this study is to understand the role of Internal Quality Control and External Quality Assurance Service as of now; IQC & EQAS are the procedures that are being used for quality control and assurance in the analytical phase in any clinical laboratory. Methodology: In laboratory of GMCH, we used Roche for IQC of clinical chemistry while, BIORAD was used for Immunoassay. For EQAS, BIORAD control was used for both clinical chemistry and immunoassay. The IQC and EQAS controls were stored at appropriate temperature. Controls were reconstituted by trained technicians in calibrated pipettes and the shelf- life of controls was checked before running. Precision check, linearity check and derivation of lab mean was also done regularly. Results: After obtaining results of IQC and EQAS, it helped to distinguish the outliers, shifts, trends in LJ chart and take corrective actions for them. EQAS results helped in determination of trueness of the results, thereby preventing bias arising due to shift/trend. Conclusion: This study concludes that,IQC and EQAS are necessary for prevention of bias due to shift or trend, thereby, increasing the accuracy and precision in a clinical laboratory and plays an important role in generating more reliable patient results.

Keywords : IQC, EQAS, BIORAD, Roche.

PP-131

Reducing Repeat Testing Of Liver and Pancreatic Enzymes in Clinical Biochemistry Laboratory by Root Cause Analysis

Nihaal Maripini, Ravindra Maradi, Vijetha Shenoy Belle

Department of Biochemistry, Kasturba Medical College, Manipal, Manipal Academy of Higher education, Manipal, Karnataka, India-576104
Email ID: nmaripini@gmail.com
nihaal.maripini@learner.manipal.edu

Objectives : To reduce the number of repeat tests of Aspartate aminotransferase, Alanine aminotransferase, Alkaline phosphatase, Amylase and Lipase in clinical biochemistry laboratory by finding the root cause Methodology: After obtaining approval from institutional ethics committee, 4 months data (August2020 to November2020) on repeat testing (redos) was analysed for the following non-critical parameters - Aspartate aminotransferase, Alanine aminotransferase, Alkaline phosphatase, Amylase, Lipase. Laboratory policy was amended to perform repeat testing only upon clinician request for these parameters and same 6 months data (December2020 to May2021) was re analysed after policy amendment. Results: Average redos/1000 tests for 4 months were found to be 6.497 out of which the percentage contribution of serum enzymes was found to be 19.43% (AST-5.21%, ALT-5.18%, ALP-1.19%, Amylase-1.02%, Lipase-6.83%) costing the laboratory INR 22245/-. Root cause analysis showed that these enzymes were repeated in dilution when the result was greater than analytical measurement range without request from clinician. Corrective action was to stop repeat testing of samples in dilution only on request form clinician. Data after corrective action showed average redos/1000 tests for 6-months to be 4.404 out of which the percentage contribution of serum enzymes was found to be 7.32% (AST-3.08%, ALT-2.75%, ALP-0.73%, Amylase-0.14%, Lipase-0.61%) costing the laboratory INR 6901/-. Conclusion: Repeat testing of non-critical parameters only on clinician request can reduce burden on laboratory and improve Quality.

Keywords : Repeat testing, Quality indicators, Laboratory management, Liver Enzymes, Pancreatic Enzymes

PP-132

Quality Assurance: Application of Six Sigma in Clinical Laboratories

Neha Sharma

Biochemistry Department, Geetanjali Medical College and Hospital, Udaipur, Rajasthan, India.
Email: neha16.sharma@gmail.com

Objective : Clinical laboratories are continuing in search of method to solve analytical problems and decrease the errors to a negligible level. Quality of a test results can't be assured after multiple QC repetition. Aim of the study was to evaluate the performance of IQC in clinical Biochemistry laboratory using Sigma Metric. Methodology: Data regarding IQC and EQAS were collected from central Biochemistry laboratory of a tertiary care Hospital from jan 2021- may 2021. Sigma metrics was calculated for CV%, TEa and Bias. Quality Goal index ratio was calculated from Cv% and Bias. Results: Total 16 parameters were analyzed and interpreted using sigma metrics. In this study 3 parameters scored less than 3, 8 parameters were scored equal to 6 or more than 6, 5 scored between 3-6. For all parameters whose sigma values less than 6, quality goal index values were calculated and problems were defined. Conclusion: Applications of Six Sigma principles would significantly help in decreasing error, cost and improve the quality Assurance of Diagnostic Biochemical Laboratories service.

Keywords : CV-coefficient of Variance, TEa-total allowable error, IQC- internal quality control, EQAS-external quality assurance system, QGI- quality Goal Index.

PP-133

Quality Tools to Ensure Patient Safety and Reduce the Turnaround Time of Medical Laboratories servicing Tertiary Care Teaching Hospitals

Puja Kumari Jha[1], Rachna Agarwal[2], Rafat S Ahmed[1]

Department of Biochemistry, [1]UCMS, Delhi., [2]IHBAS, Delhi, Email ID: pujajha26@gmail.com

Objective : Turnaround time (TAT) is an important quality indicator for benchmarking any laboratory performance. This study was designed to improve the

TAT of two biochemistry laboratories serving tertiary care teaching hospitals (multispecialty & super specialty) through the application of quality tools namely Quality failure reporting, Fish bone model and Process mapping. Methodology TAT was defined for routine (4 hr) and urgent samples (2 hr) in routine biochemistry laboratory from sample receipt to reporting of results. TAT failures incidents in 2018-2019 were analyzed by Fish bone model. The Process map of TAT was studied and made more value streamed and lean after removal of waste steps. Corrective action plans were prioritized and implemented for potential causes with higher adverse outcome. Pilot solutions were implemented for six months and TAT failures incidents were reanalyzed. Results The quality failures in TAT reporting was reduced by 22% (from 34% to 12%) for urgent samples and by 19% (from 27% to 8%) for routine samples after implementation of quality tools in multispecialty hospital laboratory while in super specialty hospital laboratory, the improvement was more pronounced and the percentage TAT achieved after corrective actions were 96.57% and 98% for urgent and routine samples respectively. Conclusion Implementation of quality failure reporting culture along with quality tools led to significant increase in the results reporting in defined TAT with achievement of higher quality laboratory performance in terms of efficiency, reliability and increased patient safety.

Keywords : Quality failure, Turnaround time, Process Mapping, Fishbone Model, Patient Safety.

PP-134

Comparison of Common Biochemical Parameters in Heparinized Arterial Blood with Venous Blood

Sarvatnida Shaikh, Shilpa Jain

Department of Biochemistry, Medical College Baroda & SSG Hospital, Vadodara, Gujarat.
E-mail: sarvatnida96@gmail.com

INTRODUCTION : Biochemical tests are routinely performed from venous blood serum which is sometimes insufficient for all the tests. In some patients heparinized arterial blood is received for blood gas analysis (ABG) and is discarded after analysis. Literature does not report relationship of values of biochemical parameters in venous blood with arterial blood and whether the leftover arterial blood can be used for testing. OBJECTIVES: Present study was planned to compare values of biochemical parameters obtained from heparinized arterial blood plasma(AP) with venous serum(VS). METHODOLOGY: This study was carried out in Clinical Chemistry Laboratory, SSG Hospital on 50 heparinized arterial samples left after ABG analysis. Arterial plasma was tested for urea, creatinine, SGPT, SGOT, ALP, LDH on fully automated analyzer ERBA XL 640.These parameters were also tested from venous blood. Values obtained were statistically compared using paired t-test. RESULTS: Mean + SD for parameters in VS vs AP were as follows: urea 43.76 + 27.32mg/dl vs 44.92 + 27.92mg/dl($p=0.0226$); creatinine 1.87+2.07mg/dl vs 1.87+ 2.08mg/dl($p=0.7663$); SGPT 62.84 + 67.31 IU/L vs 62.57+66.35 IU/L($p=0.7059$); SGOT 75.34 + 66.84 vs 76.23 + 66.25 IU/L($p=0.3573$); ALP 186.34 + 114.28 U/L vs 191.10 + 113.08 U/L($p=0.1292$); LDH 707.07 + 328.21 U/L vs 722.39 + 328.96U/L($p=0.0470$) Creatinine, SGPT, SGOT showed no statistically significant difference($p>0.05$) while urea, ALP, LDH showed significant difference($p<0.05$). CONCLUSION: Arterial blood plasma can be used in place of venous serum for testing biochemical parameters like creatinine, SGPT, SGOT in case of non-availability of adequate amount of venous sample. However, for definitive conclusion, further studies with more number of samples and testing more parameters is needed.

Keywords : arterial blood biochemistry, serum, heparinized blood sample, comparison

PP-135

Role of Phlebotomists and Impact of Phlebotomist Training In Controlling Pre-Analytical Errors

Neha Priya, Arindam Ghosh

Dept of Biochemistry, M.G.M. Medical College & L.S.K. Hospital, Kishanganj,
Phone -9470948400

Objective : The present study is undertaken to find the impact of training of phlebotomists on the prevalence, origin and types of pre-analytical errors at our tertiary care hospital with their intervention with training of phlebotomists. Methodology: The cross-sectional study was to assess the pre-analytical errors found in a total of 12,847 outpatient and inpatient samples, during the Period April-2021 to September 2021. Pre-analytical errors were checked on samples obtained for regular clinical chemistry analysis. We did training of

phlebotomist regarding pre analytical errors during the period April-2021 to June-2021. Results: A total of 309 samples were found unsuitable for further processing. This accounted for 2.4% of all samples that were rejected due to pre-analytical errors during first 3 months of observations and was reduced to 2.28% after training of phlebotomist. We observed that rate of pre-analytical errors reduced by 5% . The following factors contributed to rejections: 56(0.43%) were rejected due to haemolyzed sample; 41(0.31%) was blood collection in the incorrect tubes; 52(0.40%) was clotted blood; 35(0.27%) had inappropriate timing of collection; 48(0.37%) were wrong marked samples; 65(0.50%) had an insufficient amount of sample and 12(0.09%) were lipemic samples. Conclusion: Proper training of phlebotomist has helped in statistically significant reduction in pre-analytical error.

Keywords : pre-analytical errors, rejected sample, clinical chemistry, training

PP-136

Quality Assurance of Clinical Laboratory by Root Cause Analysis of Bias in Results

Sanghapriya Mukherjee, Aparajita Kushwaha,
Pooja Patidar, Badri lal Jat, Raju Ram,
Neha Sharma, Ashish Sharma

Department of Biochemistry, Geetanjali Medical College and Hospital, Udaipur, Rajasthan.
Email: spriya.mukherjee@gmail.com

Objective : Shifts and trends are common in LJ charts and if they are not corrected it results in bias. The aim of this study is to understand the role of systematic Root Cause Analysis (RCA) in prevention of such bias. Methodology: If any parameter goes into shift/trend, we took into consideration the on board stability of calibrators, lot to lot verification, checking of mean , maintenance of machine (ILC, voltage check, lamp and cuvet), environmental condition (temperature of room, storage fridge, TDS). Result: After checking all the probable causes for the arising/trend, we are able to find out the underlying cause and take appropriate corrective action for it. Conclusion: The conclusion of this study is that, for quality control in clinical laboratory, it is important to detect and remedy the cause of shift/trend to generate both accurate and precise patient results.

Key words : RCA, shift, trend, LJ chart, ILC

PP-137

Appropriate Quality Indicators for Pre Analytical Phase Errors: An Experience of the Early Planning of Quality Assurance of a Newly Established Clinical Laboratory in a Tertiary Care Institute

Sibasish Sahoo, Kalyan Goswami,
Atanu kumar Dutta, Amit Pal,
Nibedita Sarma

Department of Biochemistry, All India Institute of Medical Sciences, Kalyani, West Bengal
Email id: sibasish.biochem@aiimskalyani.edu.in

Objectives : Quality indicators are the most important tools in quality assurance service in medical laboratories. The assurance of Quality patient services is always challenging for a newly established laboratory setup. Pre-analytical steps are the major source of errors in laboratory diagnostics. The objective of this study is to evaluate certain specific quality indicators in detecting such possible errors to plan for appropriate quality management. Methodology: A pilot data comprising of the entries of the test request forms, time of collection and duration of sample transport, and the types of sample rejection and their numbers that occurred in a tertiary care start-up laboratory between August 2021 to October 2021 was documented. Result: The preliminary analysis showed certain important trends that will be discussed along with the proposed study outcome which will definitely be of benefit for the overall quality management plan. With proper root cause analysis, the corrective measures would be taken to minimize the percentage of each error of this pre analytical phase of quality assurance system of the laboratory. Conclusion Hence to obviate the challenge of the initial lab set-up associated problems, an early planning for proper quality management in a scientific way through effective use of proper quality indicators can be rewarding. This will help to form the lab-specific guideline as a means to ensure that the laboratory implements an effective approach towards selection, interpretation, and application of information derived from well-designed quality indicators.

Keywords : Quality-Indicators, Preanalytical, quality assurance, lab-setup

PP-138

Comparison of Electrolytes Measurement by Blood Gas Analyser and ISE Analyser in a Tertiary Care Hospital

Ritika Punjabi, Shilpa Jain

Department of Biochemistry, Medical College, Baroda & SSG Hospital, Vadodara,Gujarat
E-mail: rp2356@gmail.com

INTRODUCTION : Electrolytes estimation (Na^+, K^+) is routinely done in Clinical Laboratories by Ion-Selective Electrode (ISE) Analyser in serum obtained from venous blood. Most of the arterial blood gas analysers (ABG) also give Na^+ and K^+ along with blood gas analysis report in the heparinised arterial blood sample OBJECTIVES: Present study was planned to compare the results of Na+ and K+ by these two methods and assess whether Na^+, K^+ report from blood gas analyser can substitute the results from ISE analyser. METHODOLOGY: This retrospective study was carried out on blood gas samples received in Clinical Chemistry Laboratory for which Na^+ and K^+ analysis had also been done been done by ISE analyser around the same time. Statistical analysis was done by applying paired-t test. RESULT: Reports of 101 ABG analyser samples received during month of August 2021 were analysed. The venous serum sodium value was significantly higher than arterial whole blood value (139 ± 7.02mmol/L vs 137.68 ± 8.17 mmol/L, $p<0.05$). There was highly significant statistical difference between venous serum potassium and arterial whole blood potassium values (4.19±0.86 mmol/L v 3.82±0.80 mmol/L, $p<0.0001$). CONCLUSION: The values obtained for electrolytes (Na^+ and K^+) differ significantly and so the results obtained from ABG analyser are not reliable for the definitive diagnosis and treatment of patients.

Keywords : Electrolytes, ISE, Blood Gas Analyzer, Comparison

PP-139

A study of Pre-analytical Errors in the Laboratory

Badri Lal Jat, Sanghpriya Mukherjee,
Aparajita Kushwaha, Rani Kumari,
Raju Ram, Neha Sharma, Ashish Sharma

Department of Biochemistry, Geetanjali Medical College and Hospital, Udaipur, Rajasthan.
Email-badrilal7223@gmail.com

Objective : In a clinical laboratory, due to excessive human interference the probability and frequency of errors is very high. The aim this observational study is to detect and remedy various pre-analytical errors. Few common pre-analytical errors are hemolyzed sample, short sample, sample clot etc. errors can occur at various stages before the analysis. Improper sample collection and labeling, incubation and centrifugation are commonly seen. Materials and Methods: Data for this observational study has been collected from the central laboratory of GMCH, for June-August Result: in June, the total number of tests performed were 64968 , the number of pre-analytical errors found is 12, in July out of 77617 only 14 errors were found and in the month of August out of 77467 only 12 pre-analytical were found. Conclusion: through proper training and carefulness of all personnel the laboratory was able to achieve 0.01% total pre-analytical errors in the span of three months.

Keywords : pre-analytical errors, hemolyzed sample, incubation, centrifugation.

PP-140

Role Of Retain Sample Verification in Clinical Laboratory

Aparajita Kushwaha, Sanghapriya Mukherjee,
Aafreen Syed, Badri lal Jat, Raju Ram,
Neha Sharma, Ashish Sharma

Department of Biochemistry, Geetanjali Medical College and Hospital, Udaipur, Rajasthan.
Email: aparajita.work31@gmail.com

Objective : The accuracy of various biochemical test results plays a crucial role in the diagnosis and treatment of a patient. Retain sample verification

has proven to be a necessary tools that helps in providing results of utmost accuracy and quality. The aim of the study is to conduct periodical retain sample verification to check and improve the authenticity of the results provided for various biochemical parameters by clinical laboratory. This not only provides patients and doctors with accurate results but also serves as an important process to maintain internal quality and reliability of the laboratory. Materials and methods: Verification of retained sample was conducted in clinical laboratory of GMCH for the month of June 2021 to current. The samples were stored at 2 to 8? after separation of serum into an aliquot for 24 hours. Result: We have found an acceptable difference between fresh and retain sample which is calculated by 1.97* C.V%. Conclusion: It is an easy way to rerun the sample in case of mismatch between reports and clinical history without another vein puncture. It also saves time and resources that would be wasted in transportation and maintenance of repeat sample.

Keywords : Retain sample verification, internal quality, accuracy, NABL documentation.

PP-141

Evaluation of Performance of Internal Quality Control in A Clinical Chemistry Laboratory Using Six Sigma-A Retrospective Analysis

Nibedita Sarma, Subhosmito Chakraborty,
S Sugumar, R Bhattacharya

Clinical Biochemistry division of Deptt of Lab Sciences, Tata Medical Centre, Kolkata
Email: nibedita.amc@gmail.com, subhosmito.chakraborty@tmckolkata.com

Objective : Medical laboratories play a vital role in clinical decision making.Stringent quality assurance in testing laboratory is required in all phases. With the advent of automation a reduction of variation has been seen. Six sigma is one metric of laboratory performance which aims to fit at least six standard deviations of an assay within defined total allowable error characteristics of each assay. In this study we evaluated six sigma metrics for 21 clinical biochemistry parameters in order to analyze our performance. Methodology: We conducted a retrospective data analysis from March - November 2020 in Tata Medical Center, Kolkata. Total allowable error (TEa) considered as per (CLIA)-88 Proficiency Testing Criteria.Coefficient of variance (CV) calculated from monthly internal quality control data. Bias percentage for each parameter calculated from a commercially available proficiency testing scheme.Sigma metrics and Quality goal index (QGI) calculated using TEa%, Bias% and CV%. Result: For lower level internal quality control, ten out of the 21 analytes achieved high six sigma quality performance. Nine analytes showed very good performance and two analytes failed minimum sigma quality performance. For higher level control the data collected indicated that sixteen out of 21 analytes qualified six sigma quality performances, four analytes had very good performance and one analyte had less than desirable sigma metrics. Conclusion: In our study lipase found to be the best performer and bicarbonate found to be poor performer on sigma metric analysis. Therefore sigma metric analysis can help evaluate the performance of laboratory.

PP-142

Study of Serum Neutrophil Gelatinase Associated Lipocalin (Sngal) In Patients with Diabetic Nephropathy (DN)

Sushil Kumar, Kiran Dahiya,
*H K Aggarwal, **Monika Verma

*Department of Biochemistry, * Department of Medicine, ** Department of Pharmacology*
Pt. B. D. S. Post-Graduate Institute of Medical Sciences, Rohtak
E-mail : sushil.soni87@gmail.com

Objectives : NGAL, a glycoprotein present in kidneys at tubular cell level, acts as a marker of endothelial dysfunction that can be predictor of microvascular and

macrovascular complications in diabetes. Thus, this study was planned to assess the renal status of diabetes mellitus (DM) patients with and without nephropathy. Methodology: 40 patients of DM and DN each were enrolled and levels of serum NGAL was assessed using enzyme linked immunosorbent assay (ELISA) kit. Results: Increased level of sNGAL was found in DN patients (218.97±80.70) as compared to DM patients (182.21±52.35) and the difference was statistically significant ($p<0.05$). Conclusion: In view of above findings it may be concluded that sNGAL might act as potential marker of tubular injury in diabetic patients.

Keywords : Diabetes mellitus, Diabetic nephropathy, sNGAL, ELISA

PP-143

Estimation of Inflammatory and Cardiovascular Risk Markers in Patients with Chronic Kidney Disease with and Without Diabetes

Sachin Dominic, Siraj Ahmed Khan,
N. N. Sreedevi, Iyyapu Krishna Mohan,
M. Noorjahan, M.Vijaya Bhaskar, K. S. S. Sai Baba.

Department of Biochemistry, Nizam's Institute of Medical Sciences, Punjagutta, Hyderabad -500082
sachind170291@gmail.com

Objectives : To estimate levels of inflammatory and cardiovascular risk markers in chronic kidney disease patients, and to study their association with diabetes. METHODOLOGY: 60 CKD patients and 20 healthy controls were included in the study. Blood samples were evaluated for serum creatinine, urea, glucose, LDH, CPK, ferritin, hsCRP, uric acid, d-dimer, fibrinogen, total leucocyte count, ESR, HbA1c and lipid profile. eGFR and atherogenic index of plasma (AIP) were calculated. Patients were grouped depending on their stage of CKD. To assess the effect of diabetes, cases were also grouped based on their HbA1c levels. RESULTS: Out of 60 CKD patients, 44 were males and 16 were female, with a mean age of 47 ± 14 years. The median levels of blood urea, serum creatinine, LDH, ferritin, hsCRP, uric acid, d-dimer, total leucocyte count, AIP and ESR were significantly higher across the CKD stages, and when compared to healthy controls. Significant positive correlation was seen between creatinine and ferritin, hsCRP, ESR, uric acid and fibrinogen. Inflammatory markers were elevated in diabetics when compared to pre-diabetics, but not significantly. Positive correlation was observed between HbA1c and uric acid, fibrinogen, hsCRP and AIP. CONCLUSION: We concluded that CKD is associated with a systemic inflammatory state. It is also associated with increased cardiovascular risk, which is further pronounced when diabetes mellitus is also present.

Keywords : Kidney, Diabetes, Inflammation, Marker

PP-144

Study of Serum Bilirubin and eGFR in Type 2 Diabetes Mellitus

Pullaiah Pasupuleti[1], Harnam Kaur[1],
Seema Patel[1], Gini Garima[1],
Praveen Malik[2], Sonam Bhatia[1]

[1]Department of Biochemistry, [2]Department of Medicine, ESIC Medical College and Hospital, Faridabad

Introduction : The burden of diabetes is increasing rapidly in Indian population as well as worldwide there are many diagnostic and prognostic markers which are routinely used for follow up and prognosis of T2DM patients. Recent studies are proving bilirubin as a marker for assessment of T2DM prognosis due to strong antioxidant and anti-inflammatory nature. Serum bilirubin and eGFR is important for early determination of diabetic nephropathy. Thus the present study is taken up to study the serum bilirubin levels and eGFR in patients with T2DM. Material and Methods: A case control study, conducted in the Department of Biochemistry, ESIC Medical College and Hospital, Faridabad. 50 T2DM patients and 50 age and gender matched healthy individuals were included. Comparison between means of two groups done by student t-test, and association of markers was studied by linear regression/logistic regression analysis. SPSS-20 and Microsoft Excel work Sheet and drawn the results. Results: Significantly increased levels of serum bilirubin

in T2DM (p>0.01) compared to controls shows a significant positive correlation with eGFR (p<0.05; r =0.3). Conclusion: Increased serum bilirubin in T2DM didn't show any effect of eGFR. Hence the study concludes that even though serum bilirubin has antioxidative ad anti-inflammatory nature it cannot help in protecting the renal function in T2DM patients.

Keywords : T2DM, Bilirubin, eGFR, Diabetic nephropathy.

PP-145

To Study the Laboratory Profile of Acute Renal Failure in Different Stages of Sepsis Syndrome

Dipali Singh, Farhan Usmani,
Yogesh Kumar Sahay,
Rita Chaudhary, Madhu sinha

Department of Biochemistry, Patna Medical College and Hospital, Patna, Bihar 800004
Email: dr.dipalisingh24@gmail.com

Objectives : Renal involvement in sepsis syndrome especially in critically ill patients is common and sepsis still remains a major problem both as a precipitating and complicating factors in acute Kidney injury. So, Objectives of this study is to analyse the clinical manifestations and laboratory profile of acute renal failure in different stages of sepsis syndrome. Methodology:- Fifty patients of septicaemia with renal involvement were studied in the department of Biochemistry, Patna medical college, Patna from January 2019 to December 2020. Results: Azotemia, oliguria, metabolic acidosis, anaemia, hyperkalemia hypocalcemia and proteinuria were the commonly encountered renal manifestations in patients with sepsis syndrome.

Conclusions : Diabetes mellitus, hypertension, older age (>60 years), pre-existing CKD, nephritic syndrome, HIV infection, malignancy and nephrotoxic drug intake were important risk for the development of sepsis, AKI or both

Keywords : Diabetes mellitus, hypertension, older age (>60 years), pre-existing CKD

PP-146

Renal Stone Analysis in Population of Telangana State- A Retrospective Study

Hajra Luqman, Noorjahan,
M.Vijaya Bhaskar, NN Sreedevi,
Siraj Ahmed Khan & K.S.S.Sai Baba

Department of Biochemistry, Nizam's Institute of Medical Sciences. Hyderabad-500082,Telangana, India.

Objectives : To assess the prevalence of various types of kidney stones in the population of Telangana. MATERIAL AND METHOD : The Retrospective data of 180 cases from November 2016- April 2021 was collected. Among the total 180 cases, 59 were males, 121 were Females with a mean age of 35+/- 5 Years. The patients had passed renal stones while micturating or had undergone Percutaneous Nephrolithotomy (PCNL), Ureterorenoscopy (URS) or open surgical techniques. The stones were analysed using qualitative tests for detection of calcium, oxalate, uric acid, phosphate, carbonate, cystine and xanthine. Statistical analysis was done using Microsoft Excel software. RESULTS: Among the total 180 cases, 59 were males and 121 were Females with a mean age of 35+/- 5 Years. All were on a non- vegetarian diet, 72 presented with single stone, 47 presented with 2-3 stones and 61 patients presented with multiple (>3) stones. After quantitative analysis, 83% stones composed of calcium, 56% had oxalate, 39% had phosphorus, 34 % had uric acid, 17.5 % had xanthine , 6 % had cystine and 5% had carbonate in them. CONCLUSION: In our study we found more prevalence of calcium and oxalate stones in the population of Telangana state. Higher prevalence was also found in females and in those consuming non- vegetarian diet. Increase in urinary calcium excretion is strongly related to the consumption of animal proteins, with a consequent reduction in urinary pH and citrate excretion, which are the basis of stone formation.

Keywords : renal, stones, Telangana, oxalate

PP-147

Impact of Neutrophil Gelatinase Associated Lipocalin on Acute Kidney Injury Associated with Clinical Comorbidities

Munilakshmi. U, K.N.Shashidhar,
V. Lakshamiah, Madhavireddy,
C. Muninarayana

Background : Acute Kidney Injury, largely asymptomatic and establishment of diagnosis relies on functional biomarkers such as serial serum creatinine measurements. Eventhough serum creatinine is a well established marker for kidney injury due to its delayed and unreliability limits its utility in AKI. Objectives: To estimate and compare NGAL and Cystatin C levels in AKI and to test the hypothesis that NGAL is an early biomarker in AKI with associated comorbid conditions. Materials and methods: Total 500 subjects for a period of eighteen months with the clinical comorbidities secondary to AKI were included in this study. Serum NGAL, CysC, creatinine, ACR, hs-CRP, NO, Malondialdehyde, vitamin C and Gpx estimated by standard methods. Results: Study subjects were classified as per the RIFLE criteria, with follow up from admission to the day of patient discharge, data categorized into frequency intervals of 0-4, 5- 9, 10- 14 and 15-18 days respectively. We observed isolated decrease of NGAL over 0- 14 days in cases of Snakebite and CPB, progressive decline NGAL & Cys C in hypertensive subjects and progressive decline of NGAL, Cys C and Scr of Leptospirosis. ROC showed NGAL as the better biomarker to detect early renal damage and decreased antioxidants determine the extent of renal damage in the included clinical comorbidties. Conclusion: Elevated levels of NGAL, creatinine, ACR, baseline inflammatory, oxidants and endothelial activation markers are predictors of AKI in the selected clinical conditions. Early management of etiological factors prevent the risk of AKI, as it has good prognosis with early intervention.

Keywords : Acute kidney injury, NGAL, Cystatin C, ACR

PP-148

Role of TSH in Premenopausal and Post Menopausal Women in RIMS, Ranchi

Elvis Vishal Saurabh Dadel[1], Tarique Aziz[2]

[1]*Phulo Jhano Medical College, Dumka, Jharkhand*
[2]*RIMS, Ranchi, Jharkhand*

Objective : To Evaluate the Role of TSH In Premenopausal and Post-Menopausal Women in Rims, Ranchi Methods- This Study was Conducted in 100 Premenopausal Women and 100 Post-Menopausal Women in Rims, Ranchi Results- In the present study we found that TSH was Higher in Post-Menopausal Women compared to Premenopausal Women Conclusion- Thyroid hormones plays an important role in maintaining Normal Reproductive Behavior by directly affecting on Gonadal function and indirectly interacting with Sex Hormones Binding Protein.

Keywords : TSH, Premenopausal, Post Menopausal, Sex Hormones Binding Protein

PP-149

Association of Vitamin D Deficiency with Endocrine Parameters in Infertile Women with Polycystic Ovarian Syndrome

Shilpasree A S[1], Vinuta B Kulkarni[2],
Vidya S Patil[1], Rathnamala M Desai[3]

[1]*Department of Biochemistry,* [3]*Department of Obstetrics and gynaecology*
SDM College of Medical Sciences & Hospital, Shri Dharmasthala Manjunatheshwara University, Dharwad, Karnataka
[2]*Department of Obstetrics and Gynaecology, KLE's JGMMC, Hubballi*
Email ID: shilpasree2007@gmail.com

Background and Objectives : Polycystic ovarian syndrome (PCOS) is the most common endocrinopathy in women of reproductive age group, characterised by various metabolic and reproductive disturbances. Vitamin D is a fat-soluble vitamin, having major influence on reproductive health. Since anovulatory infertility is the most common presentation in PCOS, we aim to determine the circulating Vitamin D levels in infertile patients with PCOS in comparison with normal

fertile controls and correlate it with other endocrine parameters. Methodology: A cross sectional study was conducted in a tertiary care hospital including 111 infertile women presenting with PCOS and 107 normal fertile controls in the age group 18-39yrs. Circulating FSH, LH, Total testosterone, SHBG and Vitamin D levels were measured in both the groups by chemiluminescence immunoassay. Free androgen index (FAI) was calculated. Circulating Vitamin D levels in PCOS patients was compared with normal fertile controls using unpaired 't' test and correlated with other endocrine parameters using Pearson correlation analysis Results: Mean circulating Vitamin D levels in cases was significantly lower compared to controls (17.08 Vs 26.95, $p<0.001$). Vitamin D showed a significant negative correlation with testosterone (r -0.66, $p<0.001$), FAI (r -0.41, $p<0.001$) and significant positive correlation with SHBG (r 0.18, $p< 0.001$). No significant correlation was observed between circulating Vitamin D levels with other endocrine parameters like FSH, LH and LH:FSH ratio. Conclusion: Low circulating Vitamin D levels in infertile PCOS patients and its correlation with endocrine parameters found in our study suggest the possible role of this fat-soluble vitamin in pathogenesis and complications of PCOS.

Keywords : Polycystic ovarian syndrome, Vitamin D, Infertility, Source of support: The study is funded by Advanced research grants, Rajiv Gandhi University

PP-150

A Comparative Study of Serum Calcium, Magnesium and Zinc Concentration in Preeclampsia and Normotensive Pregnant Women attending a Tertiary Care Hospital of Tripura

Dipanwita Roy, P S Pal,
Jayanta Ray, R K Goswami

Dept of Biochemistry, Agartala Govt. Medical College, P.O Kunjavan, Agartala, Tripura, India
Email-nwita.roy@gmail.com

Objective : Preeclampsia is the most common medical complication of pregnancy associated with increased maternal and foetal morbidity and mortality worldwide. Being a multifactorial progressive disease, biomarkers for the prediction of preeclampsia are integral to disease stratification and targeted therapy. In this context, the present study is carried out to compare the serum levels of calcium, magnesium and zinc among the preeclamptic and normotensive pregnant women and determine the association of these trace elements with the severity of the disease. Methodology: This cross-sectional study includes 45 preeclampsia cases and 45 normotensive pregnant women as control considering the inclusion and exclusion criteria. Cases and controls are matched. Estimation of serum calcium, magnesium and zinc was done by Spectrophotometer. Data were expressed as mean ± SD and p-value < 0.05 considered statistically significant. Result: Both serum Calcium, Magnesium conc. (9.01 ± 0.41 vs 8.70 ± 0.46, p= 0.001), (1.74 ± 0.2 vs 1.52 ± 0.19, p = 0.008) found decreased & highly significant; serum zinc conc. (60.04 ± 11.67 vs 52.81 ± 17.48, p = 0.02) also found to be significantly lower in preeclampsia cases compared to control. Significantly higher BMI (p=0.04) was found in preeclampsia cases as well. Low serum calcium level is also found in 29% of the control group. Conclusion: The findings of this study reveal that low levels of maternal calcium, magnesium and zinc may be risk factors in the etiopathogenesis of preeclampsia. So, early detection and supplementation are helpful to treat the deficiency and reduce the incidence of preeclampsia.

Keywords : pregnancy, preeclampsia, biomarker, trace elements

PP-151

Association of Vitamin D with Metabolic Profile in PCOS Patients: A Cross Sectional Study in a Tertiary Care Hospital

Shilpa Gupta, Iftekhar Alam,
Arindam Ghosh, Aritri Bir

Dept of Biochemistry, MGM Medical College & LSK Hospital, Kishanganj Bihar

Objective : To assess vitamin D level in obese and nonobese PCOS women, and then to evaluate the association between vitamin D status and metabolic derangements in them. Methods Serum 25-hydroxyvitamin D [25(OH)D] was assessed in 30 women with PCOS. Vitamin D status was evaluated with respect to their metabolic derangements (Lipid profile, Glycemic status, Insulin Resistance). Results Serum 25(OH)D was significantly lower in PCOS women based on their BMI status. Presence of metabolic syndrome along with dyslipidemia and Insulin resistance were strikingly present in those patients as well. Conclusions Presence in metabolic syndrome

along with varied metabolic alteration can be attributed to the changes in vitamin D status inpatients of PCOS. Causality linkage can be established by further analysis in larger population.

PP-152

Assessment of Serum Ferritin Levels and Its Relation to Markers of Dyslipidemia and Hormonal Status in PCOS (Polycystic Ovary Syndrome) Patients

Arockiya Rexlin.Y, V.M.Vinodhini,
M.Anuradha, Renuka.P

Department of Biochemistry, SRM Medical College Hospital & Research Centre, Kattankulathur, Chengalpet - 603203
Email: ar4082@srmist.edu.in

Serum ferritin level is widely used as a clinical biomarker for determining body iron status and its levels rise in PCOS especially when glucose tolerance is impaired indicating mild iron overload. Objectives: This study is to estimate the status of serum ferritin in PCOS (Polycystic ovary syndrome) patients and its association with markers of dyslipidemia, inflammation and hormonal status (Lipid profile, Hs-CRP, LH, FSH, TSH). Methodology: This is a Case-control study approved by Scientific Committee and Ethical clearance has been obtained (IEC no: 2865/IEC/2021). Study group comprises of 34 women with PCOS of age group 20-40 years. Apparently healthy 34 age matched female volunteers with no history of menstrual irregularity attending the Master Health Checkup programme of SRM MCH&RC, Kattankulathur forms the control group. Patients with kidney disease, auto immune disease, history of any acute inflammation, cardiovascular disease, prolactinoma, congenital adrenal hyperplasia, Cushing's syndrome and virilizing ovarian or adrenal tumors will be excluded from the study. The data will be analysed using student's T test and Pearson correlation equation among the average levels of various parameters between the two groups using SPSS 22.0. Hypothesis: Serum ferritin may be significantly elevated and associated with lipids, inflammation and hormonal status in PCOS patients.

Keywords : PCOS, hs-CRP, Luteinizing Hormone, Follicle Stimulating Hormone, TSH.

PP-153

Correlation between Hypomagnesemia & Insulin Resistance in Polycystic Ovary Syndrome

T. Dixit Sweety Saral , B.Gayathri,
M.Anuradha, Renuka.P, V.M. Vinodhini

Department of Biochemistry, SRM Medical College Hospital & Research Centre, Kattankulathur, Kancheepuram - 603203, Tamilnadu, India

Objective : Polycystic ovary syndrome is a public health problem worldwide, Polycystic ovary syndrome (PCOS) is a hormonal disorder common among women of reproductive age. Serum magnesium (Mg) is often associated with insulin resistance (IR), cardiovascular problems, diabetes mellitus, and hypertension are risk factors that can indicate a higher risk of cardiovascular events and type 2 diabetes in the future. Rotterdam criteria states that patients must present with 2 out of the 3 symptoms: clinical and/or biochemical Hyperandrogenism, Oligomenorrhoea/Amenorrhea, or polycystic ovaries confirmed by ultrasound. Patients with PCOS are known to have a high incidence of insulin resistance. Magnesium is needed for appropriate glucose utilisation and insulin signalling, Magnesium acts as a second messenger in insulin action to assess the serum magnesium and insulin among patients with polycystic ovary syndrome (PCOS). Methodology: In this cross-sectional study 31 healthy controls and 31 cases with PCOS aged 18 to 40 years are recruited. Fasting plasma glucose, HbA1c, lipid profile, serum magnesium, serum insulin are estimated. The correlation between these biochemical parameters is studied in the PCOS group. Hypothesis: Hypomagnesemia may be associated with insulin resistance in PCOS subjects

Keywords : Polycystic ovary syndrome, Hypomagnesemia, Insulin resistance, Hypertension, Thyroid disorder, Hormonal disorder, Diabetes.

PP-154

Estimation of Lipid Profile in Pregnant Women with Preeclampsia: A Case –Control study in Central India

Sunil Singh Narwaria, P.D. Sarkar,
RajeevLohokare, S.Paneri, BhavanaTiwari

Department of Biochemistry, M.G.M. Medical College Indore, M.P.
email-snarwaria.sn@gmail.com

Preeclampsia (PE) is a hypertensive disorder occurring in 3-8% of all pregnancies (1). Exact pathogenesis of PE is not yet clear but most popular is the oxidative stress theory. There are evidences indicating the risk of preeclampsia is increased in women with raised levels of oxidized LDL and triglycerides(2), Oxidized lipid may have a role in vascular dysfunction & other pathologies seen in preeclampsia. Our study is designed to evaluate the changes in lipid profile that develops during normal pregnancy and PE.

MATERIAL AND METHODS : The study was conducted in the Dept of clinical biochemistry M.G.M. Medical College & M.Y Hospital, Indore. Written informed consent was taken from 50 healthy pregnant women (controls) and 50 pregnant women with PE (cases) after ethical approval from the institution . The blood sample was collected after aseptic precautions from all participants. Lipid profile were analysed on fully Bio system automated analyzer. Results were analyzed by using appropriate statistical methods. RESULT;- Our study has shown that serum lipid profile in patients with preeclampsia is higher as compared to healthy pregnant women. Serum cholesterol & Triglycerides levels in cases are higher 192±37& 193.57±19.41 mg/dl & in controls are 171±37 & 126.7±19.48 mg/dl. CONCLUSION: Our study concludes that Dyslipidemia is significantly evident and plays an important role in pathogenesis of PE.The various causative factors for dyslipidemia and its prevention need to be further studied and evaluated. Conflict of interest;- Nil

Keywords : Preeclampsia, Oxidative stress, Vascular dysfunction, Dyslipidemia

PP-155

Effect of Brisk Walking On Adiponectin Levels in Women with Polycystic Ovarian Syndrome

K.A.Arul Senghor, Meera S,
V.M.Vinodhini, M.Anuradha[1]

Department of Biochemistry, [1]Department of Obstetrics & Gynaecology
SRM Medical College Hospital & RC, SRM IST, Kattankulathur, Chengalpattu, TN
arulsenk@srmist.edu.in

Objective : Physical activity and adiponectin regulates Hypothalamus-pituitary-ovarian axis and facilitates ovulatory reproductive cycle. Aim of the study is to determine the effect of brisk walking on the levels of adipocytokines in women with PCOS. Methodology: This Interventional study was conducted in 143 PCOS married women (as per Rotterdam's criteria).Intervention of 150 mins / week of physical activity of brisk walking with moderate intensity was advised for 12 weeks. Adiponectin and Resistin were analyzed with Biovendor ELISA kits. HOMA-IR and HOMA-adiponectin was calculated to assess insulin resistance. Results: Baseline data revealed hypoadiponectinemia and hyperesistinemia with elevated markers of insulin resistance (HOMA-IR and HOMA-adiponectin) in PCOS infertile women. After the intervention for 12 weeks, on comparison with baseline data the participants who met 150 mins/week of brisk walking had 4.76% of weight reduction with increased adiponectin, decreased resistin, HOMA-IR and HOMA-adiponectin. Regression analysis of Adiponectin revealed significant positive correlation ($r = +0.76$) with duration of physical activity. Diagnostic performance of Adiponectin at a cutoff value < 7.3 µg/ml, evaluated with ROC analysis revealed sensitivity of 93.8% and specificity of 82% (AUC of 0.96) represented insulin resistant state. Conclusion: Elevated beneficial adiponectin levels with improved insulin sensitivity as revealed with the effect of brisk walking facilitate the chance of ovulatory process in PCOS women.

Keywords : Adiponectin, Resistin, Insulin resistance, physical activity

PP-156

Initial and Day Four B-hCG Levels as Predictors of Outcome of Single Dose Methotrexate Therapy in Medical Management of Tubal Ectopic Gestation

Neeraj Yadav**, Anuradha Kumari*,
Ratna Biswas, Ekta Malik**

Department of Obstetrics and Gynaecology and Biochemistry***
Lady Hardinge Medical College & Associated Hospitals, New Delhi-110001
Mail id: neerajyadav0107@gmail.com

Aim and Objectives : To study initial and day 4 β-hCG levels as predictors of outcome of single dose methotrexate therapy in medical management of ectopic pregnancy. Material and Methods: Thirty patients after confirmed diagnoses of tubal ectopic pregnancy were enrolled in the study. β-hCG estimated using a sequential two step immunoenzymatic (sandwich) assay. Results: Out of 30 women who received inj MTX on day 0, 19 (63.3%) women were treated successfully with single dose of methotrexate (group 1), 8(26.6% women required second dose of methotrexate and 3(10%) women required surgery. Women who required second dose or surgery were treatment failure (group2) (36.6%) with single dose methotrexate regimen. Mean initial β-hCG β-hCG level was 2294.92±1162.93 mIU/mL in group 1 and 3831.18±1066.83 mIU/mL in group 2. The difference of mean was statistically significant between group 1 and group 2 on day 0, day 4 and day 7. Conclusion: Results in present study favour therapeutic intervention with second dose of methotrexate on day 4 against day 7 as in the current protocol in women with rising trend of β-hCG between day 0 and day 4. Keywords:β-hCG, Predictors, Single Dose Methotrexate Therapy, Tubal Ectopic Gestation,

Keywords : β-hCG, Predictors, Single Dose Methotrexate Therapy, Tubal Ectopic Gestation,

PP-157

Hypovitaminosis D and IL-6 in Preeclampsia

Khandelwal A, Gaur S, Bhatotiya C,
Nanda S, Kharb S

Department of Biochemistry and Obstetrics and Gynecology, Pt. B. D. Sharma PGIMS, Rohtak, Haryana
Email id: dr.aparna.khandelwal@gmail.com

Introduction Preeclampsia is one of the main causes of maternal and fetal mortality and morbidity. Nutritional factors and activation of inflammatory pathways are thought to be involved in pathogenesis of preeclampsia. Normal pregnancy is sustained by a balance between anti-inflammatory and pro-inflammatory mediators in favour of immunosuppression to prevent fetal rejection. Objective The study was aimed to compare the serum levels of vitamin D and interleukin-6 in healthy normotensive pregnant women with those of preeclamptic women. Methods The case-control study recruited 20 normotensive and 20 preeclamptic women. Blood samples were drawn to carry out routine investigations, Serum Vitamin D levels were analyzed by RIA and IL-6 levels were analyzed by ELISA in maternal serum of both the groups. Results Serum IL6 levels were higher in preeclamptic mothers as compared to normotensive and serum Vitamin D levels were lower in preeclamptic mothers as compared to normotensive. Conclusion Findings of high serum IL-6 levels in preeclamptic women along with hypovitaminosis D suggest a definite role of Vitamin D in pathogenesis of preeclampsia and IL- 6 may serve biomarker for adverse pregnancies.

Keywords : Preeclampsia, Serum, IL-6, Hypovitaminosis D, Normal pregnancy

PP-158

Selenium Supplementation in Pregnancy- Maternal and Newborn Outcomes: A Systematic Review

Koushik Biswas[1,2], James McLay[1], Fiona M. Campbell[1]

[1]*University of Aberdeen, King's College, Aberdeen AB24 3FX, United Kingdom*
[2]*Regional Institute of Ophthalmology, Medical College Hospital, Kolkata 700073, India*
Email: koushik2907@gmail.com

Objective : Selenium is an essential mineral with an antioxidant role. Our aim was to perform a systematic review of the existing literature reporting the effects of selenium supplementation during pregnancy on maternal and neonatal outcomes. Methodology: Five electronic databases (Medline, Embase, Cochrane library, Web of Science and Scopus) were searched for studies reporting the effects of selenium supplementation during pregnancy and the postpartum period on maternal and neonatal outcomes. Only randomised controlled trials on human subjects reported in English and published till June 2020 were included. Quality assessments were conducted using the modified Downs and Black quality assessment tool. Data were extracted using a narrative synthesis. Results: Twenty articles were included in our systematic review (seventeen reported maternal outcomes, two reported newborn outcomes and one both). Maternal studies reported the effects of selenium supplementation in the prevention of thyroid dysfunction, gestational diabetes, pregnancy-induced hypertension/pre-eclampsia, oxidative stress, postpartum depression, premature rupture of membranes, intrauterine growth retardation, breastmilk composition and on HIV-positive women. Newborn studies reported the effects of maternal selenium supplementation on foetal oxidation stress, foetal lipid profile and newborn outcomes in HIV-positive mothers. Majority of studies were inappropriately designed to establish clinical or scientific utility. Of interest, four studies reported that selenium supplementation reduced the incidence of thyroid dysfunction and permanent hypothyroidism during postpartum period by reducing thyroid peroxidase antibody and thyroglobulin antibody titres. Conclusion: Evidence supporting selenium supplementation during pregnancy is poor and there is a need for appropriately designed randomised controlled trials before routine use can be recommended.

Keywords : selenium, supplementation, pregnancy, maternal, newborn

PP-159

Ratio of C-reactive Protein and Serum Albumin as a New Inflammatory Biomarker in Adolescent Women with Polycystic Ovary Syndrome Biomarker

Ekta Bhartiya, Farhan Usmani

Department of Biochemistry, Patna Medical College, Patna, Email: medico.ekta@gmail.com

Objective : Polycystic ovarian syndrome (PCOS) is the most common reproductive disorder of premenopausal women worldwide. Chronic low grade inflammation is now recognised as being common in context of PCOS. This study aimed to evaluate the ratio of serum C-reactive protein (CRP) and serum albumin as predictive inflammatory marker for PCOS. Method: 200 patient with PCOS were recruited for this study and 100 normal healthy women of similar age and body mass index for control group were taken. Laboratory evaluation included estimation of fasting and postprandial blood sugar, LH, FSH, serum testesterone, serum CRP and serum albumin. Result: The serum CRP/albumin ratio as a selective biomarker for PCOS was 0.865,p<0.001 were significantly higher in PCOS patient s than in normal healthy women. Conclusion: Women with PCOS have higher levels of CRP/albumin ratio irrespective of BMI.This study supports the view that chronic low grade inflammation plays a central role in pathophysiology of PCOS.

Keywords : PCOS, CRP, LH, FSH, BMI

PP-160

Seroconversion in COVID-19: a Tool for Risk Assessment in Frontline COVID Warriors

Charu Yadav*, Sonam Singla, Vyoma Singh, Smita Sarma, Kamini Vinayak, Teena Wadhwa, Renu Saxena, Yatin Mehta

Department of Laboratory Medicine & Infection Control, Medanta-the Medicity, Gurugram, Haryana. Pin-122001, Email: drcharuy@gmail.com

Objectives : To analyse the seroconversion rate of COVID-19 antibody and its association with risk of

future infection in frontline COVID warriors. Methodology: Longitudinal cohort study conducted in 218 frontline COVID warriors. Baseline anti-spike IgG antibodies estimated and followed up for RT-PCR positive infection. Seropositive subjects were followed up with serial titres at 4 visits upto 6 months. Statistical analysis: SPSS ver. 22.0 used employing chi-square test for association of seropositivity with RT-PCR outcome. Antibody kinetics was calculated using a mathematical linear regression model. Incidence rate was calculated per 10000 person years at risk and relative risk was calculated. Results: IgG positivity was seen in 93.8% subjects who had COVID infection in past 30 days. Significantly higher incidence of infection was observed in seronegative subjects who were at 10 times higher risk of infection than seropositive cases ($p<0.001$). A sharp rise in infectivity was seen in August 2020 which declined after 2 months. Antibody titres peaked during 1.5-3months followed by steep decline till 4th-5th month and gradual decline till 6 months. Only 2 asymptomatic cases turned seronegative by the end of study. Conclusion: Analysis of natural antibody response postulated a persistence of antibodies till 6 months post RT PCR confirmed infection. The seronegative subjects were 10 times more prone to COVID infection due to lack of innate immunity.

Keywords : COVID IgG antibody, frontline COVID warriors, COVID-19 high risk group, immunity

PP-161

Objective Structured Practical Examination (OSPE) can be best innovative method for learning Biochemistry

Suman Jain, SonalSogani,
Anju Bapna and Rajneesh Prajapat

Department of Biochemistry, Pacific Institute of Medical Sciences, Udaipur.
Email: sumannemijain@gmail.com

Background : Competency based medical education curriculum has been proposed by experts and implemented by NMC (National Medical Council) since 2019 batch in India. Many institutes are still following traditional method for practical examination despite of radical shift in assessment methodology. To address these issues and to motivate students learning OSPE (Objective Structured Practical Examination) was introduced as an assessment tool. Aim- To implement OSPE in the assessment of practical skills in biochemistry department and to know the perception of students and faculty about OSPE. Methodology- Students were divided into two groups. First group was evaluated by the traditional method and second by OSPE method. Students were crossed over on a second examination. The mean score was compared statistically. Results- The mean score was found to be significantly higher ($p<0.0001$) when assessed with OSPE. Feedback from students and faculty proved the best method was OSPE. Conclusion- This evaluation showed the best assessment for learning method for students. OSPE surely will help in tailoring teaching learning method to the student satisfaction.

Keywords : OSPE, Medical education, Biochemistry, Innovative teaching, Assessment

PP-162

To Study the After Effects Seen On Vaccination with Covaxin

Prerna Banthia, Farhan Usmani, Zarin Jalal

Department Of Biochemistry, Patna Medical College, Patna, Email : prerna.banthia@gmail.com

Objective : SARS-COV-2 has been the matter of the moment from date it was declared as a pandemic. Measurement of vaccination status is important but knowing the side-effects of vaccine injected is equally important to reduce the vaccine hesitancy which is a major obstacle in COVID-19 vaccination programme. This study aims on assessment of side-effects seen after vaccination with COVAXIN. Method: Data was collected using online survey in the form of structured questionnaire conducted from 1st September to 14th September 2021. The questionnaire was divided in two parts where first part included general information and number of vaccine doses taken and second part included the questions assessing the side-effects seen. Result: Total of 247 participants participated (124: females), 38.4% had muscle / body ache, 32.4% felt general weakness, 26.4% experienced fever, 23.4% had fatigue and 23% experienced headache. Chills, Joint pain, Nausea/Vomiting, Diarrhoea and rash were also seen. Few participants also complained of Depression, Anxiety and Extreme mood swings. Conclusion: COVID-19 pandemic is still threatening the world and vaccine is a great hope for rescue. However, there are some concerns about it due to insufficient trials and fear

of its side-effects. The study showed that side-effects seen were mild and no serious adverse events were seen.

Keywords : SARS-COV-2, COVID-19, COVAXIN, India

PP-163

VARK Learning Style Preference in Medical laboratory Technologists of a NABL Accredited Laboratory

Vijetha Shenoy Belle, Monalisa Biswas, Varashree BS, Geetha

Department of Biochemistry, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal 576104

Objectives : To understand the learning preferences of medical laboratory technologists of a NABL accredited laboratory Methodology: After obtaining ethical approval from institutional ethics committee, online consent forms along with VARK (Visual, Aural, Reading, Kinesthetic) questionnaire was circulated to 25 medical laboratory technologists to understand their preferred learning styles. Scores obtained were compiled and statistical analysis was done. Results: Analysis of learning preferences revealed that most of technologists had a unimodal aural (45%) or kinesthetic (33%) then visual (11%) and reading (11%) learning preference. In bimodal learning preference AK (44.44%) pattern being the predominant followed by AR, RK, VK (22%). 40% of the technologists showed trimodal learning pattern with 50% among them showing an ARK pattern while 25% each showing VAK and VRK patterns of learning preferences. Understanding the learning style by VARK questionnaire in Medical laboratory technicians is of importance while designing activities, handouts and reference materials to ensure effective training and reinforcement. Conclusion: Kinesthetic pattern was observed across all the groups irrespective of uni/bi or tri-modal patterns indicating the adaptability of most technicians due to their working environment

Keywords : Medical Education, VARK, Questionnaire, Visual, Aural, Kinesthetic, learning

PP-164

An Observational Study of Vitamin D Deficiency in Osteoarthritis (OA) Patients

Mridula Bharti[1], Sanjay Kumar Yadav[2], Nisha[3], Santosh Kumar[1]

[1]Dept of Biochemistry, [2]Dept of Orthopedics, [3]Dept of Preventive & Social Medicine, RIMS, Ranchi
Email: mridula_bharti90@yahoo.com

OBJECTIVES : To observe the status of serum vitamin D level in OA patients and compare with controls. METHODS – Total 50 patients for Osteoarthritis and 50 controls were studied. Serum 25(OH)D was measured by the chemiluminescence method and concentration < 20 ng /ml was considered as deficient levels. Odds ratio [OR] was applied to determine association and student t test was used for comparing means. RESULT- The mean ages of patients and controls were 51.56±7.5 & 48.34±7.6 years, respectively. In the entire Osteoarthritis populations association was found in which serum 25(OH)D level was lower in Osteoarthritis patients than control. After using chi square test it was found that there is no significant association of vitamin D deficiency with Osteoarthritis (P- value = 0.229,chi square= 1.44) CONCLUSIONS – These findings suggest that the odds of findings lower value of vitamin D level is more in OA patients but association was not found to be significant.

Keywords : vitamin D, Osteoarthritis, association

PP-165

Impact of COVID-19 Lockdown on Mental Health of Patients with Multi-Drug Resistant Tuberculosis (MDRTB) in Tertiary Care Centre, Mumbai

Ishita Gajjar[1], Prerna R Arora[1], Jeffrey A. Tornheim[2], Nisha Kharat[1], Namrata Sawant[1], Megha Karane[1], Samridhi Sharma[1], Lancelot Pinto[3], Jai Mullerpattan[3], Ashok Mahashur[3], Ayesha Sunavala[4], Camilla Rodrigues[1], Tester F Ashavaid[1], Amita Gupta[2], Zarir F. Udwadia[3]

[1]Department of Lab Medicine, [3]Department of Pulmonary Medicine, [4]Department of Infectious Disease,

P. D. Hinduja Hospital & Medical Research Centre, Mumbai, India

[2]Infectious Diseases, Johns Hopkins University School of Medicine, Baltimore, MD, USA
Email: dr_tashavaid@hindujahospital.com

Background & Objective : Multi-Drug Resistant Tuberculosis (MDRTB) and depression act synergistically that magnify the burden of disease. The present study aims to understand the differences in depression scale using Patient Health Questionnaire-9 (PHQ-9) over the time during the COVID-19 pandemic which may cause mental and psychological changes in the patients with MDRTB. Method: A total of 155 treatment naive adults and adolescents MDRTB are enrolled in an ongoing cohort. Each participant completes PHQ-9 to assess depression at baseline, 2 weeks, 1, 2, 3, 4, 5, 6, 12, 18, 24 months of treatment and post treatment 6 and 12 months. Differences in the PHQ-9 scores for visits before COVID-19, during 1st lockdown, in unlock phase and 2nd lockdown were assessed by Chi-squared test and t-test and $p<0.05$ were considered statistically significant. Results: Out of 155 participants with median age of 27 years,, 102 (65.8%) were females A significant difference was seen in the overall PHQ-9 scores across each time period ($p<0.001$). Also, significant changes were seen in overall PHQ-9 scores before COVID-19 and 1st lockdown ($p<0.001$), during unlock phase, 2nd lockdown ($p<0.001$) and without lockdown and during 1st and 2nd lockdowns ($p<0.001$). During 1st lockdown and unlock phase ($p=0.165$), there were no significant differences seen in the PHQ-9 scores. Conclusion: In this ongoing study, changes in the overall depression scale were significantly associated with COVID-19 lockdown, during unlock phase and 2nd lockdown phase. PHQ-9 screening can be useful for patients who may benefit from additional support and counselling during the treatment during COVID-19 pandemic.

Keywords : COVID-19, Depression, MDRTB, PHQ-9

PP-166

A Comparative Study of Serum Amylase Level in Type 2 Diabetes Mellitus Patients

Sanjay Kumawat, S.K. Vardey

Department of Biochemistry, SMS Medical College, Jaipur, Email-drsnkt3@gmail.com

Background : Diabetes mellitus (DM), a metabolic disorder characterized by hyperglycemia, associated with deficiency or resistance to insulin. Amylase is secreted by exocrine portion of pancreas. Hence, this study was intended to determine the status of enzyme related to pancreatic exocrine function in Type-2DM patients and compare it with healthy controls. Aim and Objectives: To assess the serum amylase level in patients of type-2 diabetes mellitus and compare it with healthy controls. Methodology: A Case-control study was performed in Biochemistry department in collaboration with Medicine department at SMS Hospital, Jaipur. 30 diagnosed cases of type-2 diabetes mellitus between 40-70 years were included in the study and 30 age and sex matched healthy individuals as controls. Patients with any concomitant diseases which can alter pancreatic function and patient with hepatitis, alcoholic were excluded from the study. Results: Study revealed in diabetic patients the serum amylase level (54.28 ± 25.16 IU/L) was significantly lower (P value <0.05) as compared to serum amylase level (78.26 ± 28.54 IU/L) of healthy controls. Conclusion: The outcomes of the present study suggest that serum amylase has shown lower activity with Type-2DM patients than individuals who do not have DM. This enzyme can be used as an extra explanatory parameter for the evaluation of progression of the disease and response to treatment. Key words: Endocrine, Exocrine, Amylase, Type-2DM.

Keywords : Endocrine, Exocrine, Amylase, Type-2DM

PP-167

Impact of Time Delay in the Analysis of Serum Ionised Calcium, Sodium and Potassium

Rajlaxmi Tiwari[1], Prakruti Dash[2], Saurav Nayak[2]

Dept. Of Biochemistry
[1]IMS and SUM Hospital, Kalinga Vihar, Bhubaneswar-751003, Odisha

[2]All India Institute of Medical Sciences, Bhubaneswar
Email: deciduouss@gmail.com

Introduction Delay in the analysis of serum electrolytes along with clot contact time can lead to difference in results significant enough to affect clinical decisions. This study was undertaken to evaluate the effect of time lag between centrifugation and analysis on levels of serum Sodium, Potassium and Ionized Calcium in a tertiary level health care set up. Materials and methods In this cross-sectional study, 70 serum samples were analyzed for Ionized calcium, sodium and potassium under different conditions with respect to time lag and clot contact time. The analysis of Ionized calcium (IC) was done on Eschweiler Combiline 2, a direct Ion selective electrode (ISE) analyzer. Serum sodium and potassium were analyzed on Fully Automated chemistry analyzer, which is an indirect ISE analyzer. The statistical analysis was done in IBM SPSS software version 21. Results The results for intergroup comparison with different time lag and clot contact time between all the four groups for sodium, potassium and ionized Calcium was statistically significant, as obtained by application of Kruskal Wallis test. There was consistent decrease in the concentration of Sodium, Ionized calcium and an increase in serum potassium with increased delay in analysis and clot contact time. Conclusion The accurate measurement of electrolytes is of paramount importance for treatment and better prognosis of the critically ill patients. This can be accomplished by better management of the pre-analytical phase of analysis by maintaining a standard protocol in the laboratory and sample transportation.

Keywords : time delay, clot contact, Ionized calcium, sodium, potassium

PP-168

Biochemical Alterations in COVID-19 Patients: An Observational Hospital Based Study

Pawan Kumar Kare[1], Tripti Saxena[1], Anil Sejwar[2], Haresingh Makwane[1], Amit Singh Ray[1]

[1]Department of Medical Biochemistry, [2]Department of Medicine, Gandhi Medical College, Bhopal, India
Email ID: pawankare4@gmail.com

Introduction : Coronavirus disease-2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). It is a respiratory disease, which can develop into multi-organ dysfunction, leading to death. Due to SARS-CoV-2 infection, several biochemical alterations occurs in covid patients and have been associated with the severity of the disease. Objectives: To evaluate the biochemical alterations in covid-19 patients. Methodology: This study was carried out in 80 covid-19 patients who were admitted in covid tertiary care hospital after RT-PCR or RAT positive test for SARS-CoV-2. The moderate disease was defined as presence of dyspnoea with respiratory rate more than 24/min or maintain oxygen saturation between 90 and 94% on room air and the severe disease was defined as presence of dyspnoea with respiratory rate more than 30/min or oxygen saturation less than 90% on room air, presence of ARDS, severe sepsis or sepsis shock. Estimation of urea, creatinine, total bilirubin, total protein, alkaline phosphatase, SGOT, SGPT, CRP, ferritin, CPK, LDH and D-dimer were carried out using automated analyser. $p<0.05$ was considered as significant level. Results: A significant higher levels of urea, creatinine, total bilirubin, total protein, alkaline phosphatase, SGOT, SGPT, CRP, ferritin, CPK, LDH and D-dimer were found in severe COVID-19 patients as compared to moderate COVID-19 patients. A significant correlation was found between the levels of CRP and other biochemical parameters. Conclusions: Increased alteration of renal, liver, cardiac, inflammatory and coagulation parameters in COVID-19 patients due to SARS-CoV-2 infection indicate its multi-organ involvement and these alterations may helpful to predict the severity and development of disease in patients with COVID-19.

Keywords : Covid-19, SARS-CoV-2, Biochemical alteration, RT-PCR

PP-169

Does Serum Albumin Have an Impact on COVID-19 Severity?

Sathiyanindhini M, Dheebalakshmi N

Department of Biochemistry, Coimbatore Medical College,Coimbatore
Email Id: sathiyavino51@gmail.com

INTRODUCTION : The Coronavirus disease 2019,global pandemic is associated with high mortality and morbidity.Under cytokine storm, Albumin can undergo irreversible oxidation that may affect its protective properties & elicits further tissue damage. Thus, measuring serum albumin levels in COVID-19 patients may give additional information to clinicians on disease activity. OBJECTIVES: To find out the relationship between serum albumin levels with COVID-19 severity in hospitalized patients in Coimbatore medical college hospital. MATERIALS AND METHODS: It is an Observational study conducted between May 2021 – July 2021. About 85 Covid positive patients (age >18 years) were included in this study with and without respiratory support.Serum albumin levels were measured and compared between these 2 groups. RESULT: Serum albumin levels are significantly reduced ($p<0.05$) in COVID-19 Patients with respiratory support. CONCLUSION: This Study demonstrates hypoalbuminemia in patients with severe COVID-19.Therefore monitoring of Albumin is necessary in COVID-19 patients to predict the severity and prognosis. Albumin Supplementation may improve prognosis but further studies are required to prove this hypothesis.

Keywords : serum albumin, COVID-19, respiratory support

PP-170

Gamification Approach as a Real-Time Tool for Student's Assessment in Competency Based Medical Education

Anurag Yadav

Department of Biochemistry MNR Medical College, Sangareddy, Telangana.Mobile : 9972456525;
Email: yadav.anurag52@gmail.com

Objectives : We aimed to obtain systematic experience on the feasibility of Kahoot app, when utilized in addition to traditional classroom education using an immediate pre- and post-assessment approach Methodology: This prospective study conducted at department of biochemistry, MNR Medical College & Hospital during the year Jan to Feb 2020. The 1st year students were taught with four different topics, after completion of two topics the groups were switched. Before switching groups, they were given with the MCQs (50 marks) of two topics which were taught in common. The satisfaction survey in form of questionnaire (Google form) was designed and requested to fill. Results: Out of 344 students, 64.2% were MBBS, 23% were Dental and 12.8% were physiotherapy 1st yr students. There was significant higher mean test scores in group A (Kahoot based MCQ) compared to group B (traditional paper based MCQ) and group D (group B students with Kahoot based MCQ) from group C (group A students with traditional paper based MCQ) with respect to the topic assessment and end test result. Students strongly agreed that Kahoot help to retain the knowledge (60.5%), it simplifies complex subject (41.9%), learning was fun (74.4%), enhance the understanding of subjects (53.5%), and 90.7% responded they want the Kahoot based learning frequently. Conclusion: The study showed the utility of game based learning apps like Kahoot use in competency based medical education as real-time assessment tool. Improvement in the learning ability and simplifying the complex subjects was the perception of students.

Keywords : Medical Education, MBBS, Gamification, Kahoot, real-time

PP-171

Serum Vitamin D Levels and Dry Eye Disease in Postmenopausal Women: A Case Control Study at a Tertiary Care Centre in Haryana

Diksha Malik, Renu Garg*,
Sumita Sethi** , Rajiv Mahendru***

**Dept of Biochemistry, ** Dept of Ophthalmology, ***Dept of Os & Gynae, BPS GMC (W) Khanpur Kalan, Sonepat*

A higher incidence of Dry Eye Disease (DED) is reported in postmenopausal women (PMW) due to effect of androgens and estrogens on production of components of tear film. Vitamin D is said to contribute to tear film stability. There are conflicting reports regarding the role of vitamin D in the development of dry eye disease, especially in PMW. So, the current study has been planned to establish any correlation between serum vitamin D levels and dry eye disease in PMW. METHODOLOGY: This is a case control study and will be conducted among 120 postmenopausal women (cases = 60, controls = 60). Serum vitamin D levels of patients will be measured after detailed ophthalmic examination for dry eye. RESULTS and CONCLUSION: Results will be discussed as the study is still ongoing. Any correlation of serum vitamin D levels in PMW with and without DED will be looked into and will be compared with severity of DED. And if present the lifestyle modifications will be explained to the patients and treatment will be given to them.

Keywords : Vitamin D, DED, Postmenopausal, Women

PP-172

Use of Patients' Laboratory Reports during Case-Based Learning in Biochemistry: Assessment of Students' Learning and Perception

Tejas Shah

Biochemistry Department, Smt. B. K. Shah Medical Institute and Research centre, Sumandeep Vidyapeeth Deemed to be University, Piparia, Vadodara-391760, Gujarat (India)

Objectives : The objectives of the study were to compare the performance of students in written tests on a topics taught by didactic lecture (DL) and case-based learning (CBL) supplemented with patients' laboratory reports (LR), and to assess students' perception on the usefulness of CBL supplemented with LR. Methodology: After prior ethical approval, total 60 1st MBBS students were enrolled voluntarily and written informed consent were obtained. They were divided into two groups: Group A (30) and B (30) by lottery method. Two topics were selected for learning sessions. The study process for topic-1 included pre-test for all students, DL session for Gr-A and CBL supplemented with LR session for Gr-B on selected topic followed by the post-test after one week. Crossover was done for Topic-2. Paired and unpaired (independent) t-tests were used to compare pre-test and post-test results within the groups and across the groups respectively. Perception of students' was taken on five-point Likert scale. Data were analysed by using SPSS software. The $p<0.05$ was considered as statistically significant. Results: Statistically significant difference was observed in pre and post-tests performance of students for topics taught by CBL with LR method than DL ($p<0.0001$). 100% students felt that CBL supplemented with LR method was very helpful, interesting and improved their interpretation skills. Conclusions: CBL supplemented with LR proved to be a very good student-centric teaching-learning method in Biochemistry as students who exposed to CBL supplemented with LR had better understanding of Biochemistry and performed better in written tests.

Keywords : Case-based learning, Laboratory Reports, Didactic lecture

PP-173

Evaluation of Activity of Serum Creatine Kinase and Lactate Dehydrogenase in Hypothyroid Patients

Shilpa Visen, Jaskiran Kaur, Pratibha Chauhan

Biochemistry, SMS Medical College Jaipur
Email: drshilpavisen@gmail.com

OBJECTIVES : To estimate serum creatine kinase and serum lactate dehydrogenase in hypothyroid patients and compare it with controls.

METHODOLOGY : A cross-sectional study was conducted in department of Biochemistry & Endocrinology at SMS Medical College, Jaipur. Serum CK and serum LDH were measured in 50 patients with known history of hypothyroidism and the results were compared with the 50 age and sex matched controls.

RESULTS-.Mean age in our study is 36.24±10.87 years in cases vs 33.34±9.92 years in controls. Mean serum creatine kinase in hypothyroid patients was 267.94±129.60 U/L and in controls was 74.08±30.46 U/L whereas mean LDH in patients was 479.96±150.41 U/L and in controls was 287.96±70.35 U/L, which were statistically significant (P<0.05). Thus we can say serum CK and serum LDH are significantly increased in patients with hypothyroidism as compared to the control group.

CONCLUSION : Significant increase in creatine kinase and lactate dehydrogenase activity shows muscular involvement occurs in hypothyroidism. Hence, these parameters can be used for screening of hypothyroidism and for diagnosing musculoskeletal involvement in hypothyroid patients.

Keywords : Hypothyroidism, Thyroid hormone, Creatine Kinase, Lactate Dehydrogenase

PP-174

Prevalence of Thyroid Autoimmune Disease in Patients of Melasma

Prashant P[1], Garg R[1], Kataria U[2], Bansal P[1], Panjeta P[1], Verma R[2]

[1]Dept. of Biochemisty, [2]Dept. of Skin and Venereal diseases, BPS GMC for Women, Khanpur kalan Sonepat (HR)-131305, Email: sodhi93@yahoo.com

Objectives : To compare prevalence of thyroid autoimmune disease in subjects of melasma with controls by measuring levels of biochemical markers of thyroid autoimmunity anti-TPO Ab & anti Tg Ab, alongwith thyroid hormones(FT3 , FT4) and TSH. Methods: Measurement of levels of biochemical markers of thyroid autoimmunity i.e anti-TPO Ab & anti Tg Ab, thyroid hormones FT3, FT4 and TSH in 30 subjects of melasma and 120 age and sex matched controls was done using commercially available ELISA kit. Anti TPO Ab levels >30 IU/mL or Anti TG Ab levels >50 IU/mL were taken as positive for autoimmunity. Pregnant females, subjects with known thyroid disease, history of thyroid surgery and medication, patients with acute or chronic systemic illness and known systemic autoimmune disease were excluded in both subjects and controls. Results: On statistical analysis prevalence of either anti TPO Ab or anti TG Ab was found in 73.33% subjects as compared to only 10% in controls and it was found significant (p value= 0.001). On comparison TSH, FT4 and FT3 values were also found significantly decreased when compared to control with p value< 0.05, though mean values fall in normal range. Conclusion: Prevalence of thyroid autoimmunity was found to be more in subjects with melasma as compared to control group and so while investigating for melasma, thyroid autoimmunity shall also be investigated.

Keywords : Thyroid, autoimmune, melasma, TPO

PP-175

Dyslipidemia in Cases of Alcoholic Liver Disease and Non Alcoholic Fatty Liver Disease

Ruby Kumari[1], Santosh Kumar[1], Suresh Kumar Toppo[2]

[1]Department of Biochemistry, [2]Department of Radiology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand
Email: drruby.jha20@gmail.com

Background : Alcoholic Liver Disease and Non Alcoholic Fatty Liver Disease are major alarming public health problem in current scenario. Still there is lack of wide research data in context of ALD and NAFLD, in our institute and state (Jharkhand). Objectives: 1.To study Dyslipidemia in cases of Alcoholic Liver Disease and Non Alcoholic Fatty Liver Disease. 2. To evaluate the utility of Serum Lipid profile values in diagnosis of ALD and NAFLD Methodology: 100 cases of Fatty Liver disease (FLD) diagnosed by USG (18-70 yrs) were enrolled in study. Subjects were divided in two equal groups, ALD and NAFLD. Lipid profile was done in both groups. Result: Data obtained during research was statistically analyzed by using SPSS version 20. Student t test for independent samples was used to determine statistical significance, p-value <0.05 was considered statistically significant. serum Triglyceride and VLDL-C was significantly raised and HDL-C significantly decreased in NAFLD group compared to ALD group. Serum Total Cholesterol and LDL-C was significantly increased in ALD group as compared to NAFLD group. Conclusion: Dyslipidemia was obtained in NAFLD group. Keywords: FLD, NAFLD, Dyslipidemia

Keywords : Alcoholic Liver Disease, Non Alcoholic Fatty Liver Disease, Dyslipidemia, FLD , Dyslipidemia

PP-176

Physico-Chemical Characterization of Glycated, Nitro-Oxidized and Glyco-Nitro-Oxidized Human Serum Albumin

Akhlas Tarannum, Zarina Arif

Department of Biochemistry, Faculty of Medicine, J.N Medical College, A.M.U., Aligarh
Email : ikhlas.tarannum5@gmail.com

Background : Human serum albumin (HSA) is the most abundant serum protein, and therefore is continuously exposed to various oxidizing/nitrating (peroxynitrite) and glycating (methylglyoxal) agents. Depending upon the nature and level of reactive species present, HSA may be glycated, oxidized, nitroxidized or glyco-nitro-oxidized. HSA contains 59 lysine and 18 tyrosine residues and therefore, is susceptible to attack by both methylglyoxal (a dicarbonyl) and peroxynitrite (a reactive nitrogen species). In inflammatory autoimmune diseases, for example rheumatoid arthritis, high levels of methylglyoxal and peroxynitrite suggests their role in pathophysiology of the disease. Objective of the study: The objective of the study was to explore simultaneous effect of methylglyoxal and peroxynitrite (glyco-nitro-oxidation) on HSA. Methodology: HSA was treated with methylglyoxal followed by peroxynitrite to generate glyco-nitro-oxidized HSA. Glyco-nitro-oxidized HSA was characterized by various biophysical and biochemical techniques. Results: Glyco-nitro-oxidized HSA showed loss in the tyrosine/tryptophan fluorescence intensity, modification in amino acids, decreased alpha-helical content and also had decreased affinity towards cobalt. The modifications have caused cross linking and aggregation in albumin which was confirmed by dynamic light scattering and transmission electron microscopy (TEM). Conclusion: It could be concluded from the above results that glyco-nitro-oxidation in HSA had caused structural changes that may play an important role in the pathophysiology of various inflammatory diseases.

Keywords : Human serum albumin, glycation, nitro-oxidation, glyco-nitro-oxidation.

PP-177

Significance of Levels of Plasma Tetrahydrobiopterin in Sickle Cell Patients with MTHFR Polymorphism

Prishni Gupta, Eli Mohapatra, Suprava Patel, Rachita Nanda, Seema Shah

Department of Biochemistry, AIIMS Raipur- 492099, Chhattisgarh,
Email: eos.oftheeast@gmail.com

Objective : To assess the effect of the MTHFR A1298C polymorphism on the levels of plasma tetrahydrobiopterin levels in sickle cell patients. Methodology: Blood samples were collected from 140 Sickle cell patients recruited from a tertiary care hospital. Leukocyte DNA was extracted from whole blood and MTHFR A1298C polymorphism was detected by Real Time PCR. Plasma tetrahydrobiopterin levels were estimated by HPLC. Data was analysed in SPSS version 20. A p value < 0.05 was considered significant. Results: Present study found that the MTHFR A1298C had three genotypes, the prevalence of the AA genotype was 40%, the AC genotype was 34.3% and the CC genotype was 25.7%. The frequency of the mutant 'C' allele was found to be 42.85%. The mean ± S.D value of plasma BH4 estimated was 0.029 µM ± 0.008 µM. The plasma levels of BH4 was lower in the patients with the CC genotype of MTHFR A1298C SNP than the AC genotype, which was lesser than the plasma BH4 levels in the wild AA genotype. The differences were statistically significant. Conclusion: The mutation causes a decreased activity of the enzyme Methylenetetrahydrofolate reductase leading to diminished levels of the plasma BH4 and the active form of the drug folic acid (5-MTHF). Patients on folic acid and having the MTHFR AC or CC genotype had decreased levels of plasma BH4 than in patients with the MTHFR AA genotype. Thus, the study concluded that a more active form of the drug would be useful for the treatment of such patients.

Keywords : Sickle cell, MTHFR, Tetrahydrobiopterin, folic acid

PP-179

A Comparative Study of Serum Lactate dehydrogenase and Lipid Profile in COPD Patients at SMS Hospital, Jaipur

Mukesh Sharma, Rati Mathur

Department of Biochemistry, SMS Medical College, Jaipur

OBJECTIVE : To assess the serum LDH levels and lipid profile in COPD patients and compare these with healthy controls.

METHODOLOGY : A case control study was performed in COPD patients at SMS Hospital, Jaipur. 50 patients with gender and age matched (>20 yrs) were enrolled. Comparison of serum LDH levels and lipid profile in COPD patients with controls were made. RESULTS: Mean age in COPD patients was 40.2±13.5 yrs and control patients was 40.8±12.74 yrs and both groups were well matched for age and sex distribution. Mean total cholesterol in cases was 185.5±23.1 as compared to controls 173.2±15.2, mean LDL in cases was 118.3±12.8 as compared to controls 112.5±12.1, mean HDL in cases was 34.6±6.2 as compared to controls 39.9±6.4, mean triglyceride in cases was 148.5±14.5 as compared to controls 133.1±12.8. Mean LDH level in cases was 345.8±72.4 as compared to controls 292.5±83.2.

CONCLUSION : TC, TG, LDL levels were significantly higher in COPD patients but there was significant decrease in the serum HDL levels of such patients as compared to controls. COPD patients were having significant rise in serum LDH levels when compared to controls.

Keywords : Lactate dehydrogenase, COPD, Cholestrol, Triglyceride

PP-180

Effectiveness of an Early Clinical Exposure Classroom Setting Model on the Performance of Medical Students

D. Padmasree, Anurag Yadav

Department of Biochemistry, MNR Medical College & Hospital, Sangareddy, Telangana.
Corresponding author: docpadmaamc@gmail.com

Introduction : Early clinical exposure is "An authentic human contact in a social or clinical context that enhances learning of health, illness, disease and the role of a health professional. ECE can be implemented in any or all of three settings: class room, hospital and community. Aim: To test the effectiveness of an early clinical exposure classroom setting model on the performance of medical students. Materials and Methods: Type of study: A prospective cross-sectional study Setting: Department of Biochemistry of a tertiary care teaching hospital, for a duration of 4 months. Participants: I MBBS students (n=150). Six case scenarios were designed using powerpoint. Each case scenario was divided into case title, case history, clinical findings, investigations and treatment. The slides were placed in random order, forming a potpourri and presented to the students. Participants were asked to sort the slides and give a diagnosis for each case. A Google forms questionnaire was used to collect feedback. Results: Number of participants who completed the activity was 132. Majority of students (85%) scored more than 80% marks in the activity. It is important to note that all students who got the diagnosis right had full marks in arranging the slides. Conclusion: This early application of clinical exposure classroom setting model helped students in building problem-solving skills by analyzing and reasoning for many cases in one go, which are essential for clinical practice.

Keywords : Classroom, Feedback, Power point, Setting, Students

PP-181

Role of Inflammatory Cytokines in Pre-Diabetes and Type 2 Diabetes

Poorvi Gupta*, Prashant Hisalkar**,
Neerja Mallick***

**Dept of Biochemistry, PCMS & RC, Bhopal*
***Dept Biochemistry, GMCH Dungarpur*
****People's University Bhopal*
Email: pjhisalkar@yahoo.co.in
poorvigupta2011@gmail.com

Background : Inflammation and type 2 diabetes mellitus (T2DM) has been extensively investigated for over a decade. However, the relationship between inflammatory biomarkers, including C-reactive protein (CRP) and tumor necrosis factor alpha (TNF-α), pre-diabetes and T2DM is still inconsistent and limited. Thus, this study is aimed to find out the role of pro-inflammatory cytokines i.e hs-CRP and TNF-α in pre-diabetes and type 2 diabetes subjects. Material & Methods: The hospital based analytical cross-sectional study was conducted in the Department of Biochemistry, People's College of Medical Science and Research Center (PCMS and RC) and Centre for Scientific Research and Development (CSRD), People's University, Bhopal. Total 900 subjects were distributed into three groups (300 pre-diabetic subjects, 300 type 2 diabetic subjects and 300 healthy subjects) as per ADA criteria. The biochemical parameters as FBG, 2-hr glucose, HbA1c and fasting insulin were analyzed. HOMA-IR was used to calculate insulin resistance mathematically. Anthropometric measurements were done. TNF-α was done by ELISA method and Immunoturbidimetric assay method was used to analyze serum hs-CRP by c311 fully automated analyzer (Roche diagnostics). Results: hs-CRP and TNF-α concentration was significantly increased in patients with type 2 diabetes mellitus and pre-diabetes in comparison to the control group at p value < 0.001. And both cytokines hs-CRP and TNF-α showed a positive correlation with HOMA -IR. In conclusion, besides consideration of CRP levels alone, our findings suggested that elevated TNF-α and CRP levels could be a potential predictor of T2DM and at pre-diabetes stage we can reduce the risk of T2D.
Keywords: High sensitive C-reactive protein- Hs-CRP, tumor necrosis factor alpha -TNF-α, insulin resistance-IR, type 2 diabetes mellitus -T2DM, pre-diabetes, inflammation.

PP-182

Prevalence of SARS COV-2 Spike Antibody in Post Covid Or Post Vaccinated Individuals

Prerna R. Arora, Namrata Dhavde,
Alpa J. Dherai, Dhanashri Shetty, Anjali Shetty,
Camilla Rodrigues, Tester F. Ashavaid

Department of Lab Medicine, P.D. Hinduja Hospital & MRC, Mahim, Mumbai-400016, India
Email: dr_tashavaid@hindujahospital.com

Background & Objective : SARS-CoV-2 pandemic is causing high morbidity and mortality burden worldwide with unprecedented strain on health care systems. Data on the prevalence of the SARS-CoV-2 antibody is expanding with growing research. The initial data on antibodies was available for nucleocapsid target proteins however with advancing research and development of vaccines against the Spike RBD domain of the virus, antibody assays are being focussed to the Spike RBD proteins. The current study aims to understand the prevalence of Anti-Spike SARS cov2 antibodies. Method: A commercially available assay targeting the SPIKE RBD domain of the virus using a chemiluminescent microparticle immunoassay was used for the qualitative and quantitative determination of IgG antibodies to SARS-CoV-2 in a total of 260 individuals. Results: A total of 260 individuals were screened which included 147 males and 113 females with a mean age of 51+16 years. A positive seroprevalence was observed in 85.3% (222/260) individuals. Vaccination details were available for 225 individuals wherein 194 were seropositive. Around 12% did not show presence of antibodies (26/211) even after 21 days of vaccination. A few non-vaccinated individuals were seropositive due to prior history of Covid infection. However, 7 individuals with past history of Covid infection and 2 post vaccination were negative for antibodies. Conclusion: Serological testing plays a vital role in understanding and ultimately combating viral outbreaks and can help identifying individuals with an adaptive immune response to SARS-CoV-2, indicating recent or prior infection. A high prevalence of positive spike antibodies is observed in most individuals.

Keywords : Spike RBD, SARS Cov2, Vaccination, Covid

PP-183

Interleukin-6 as a Predictor of Cytokine Storm and Response to Tocilizumab in a Tertiary Care Designated COVID hospital in Jharkhand

Neelam Mehta, Minakshi Mishra

Dept of Pathology, Tata Main Hospital, Jamshedpur Jharkhand, Email:drnmehta@tatasteel.com

Objective Release of Interleukin -6 a pro- inflammatory cytokine in Acute respiratory distress syndrome (ARDS) related to SARS- CoV-2 has been found .The aim of the study was to study the clinical and biochemical effects of IL-6 blockade using a humanized anti-IL-6 receptor antibody, tocilizumab (TCZ) . Methodology Retrospective analysis of 66 patients with COVID -19 ARDS evidenced by RTPCR and lung CT scan was done. Patients with increasing oxygen requirements, rising inflammatory markers suggesting cytokine storm were treated with TCZ. Demographic and clinical data were collected from the electronic medical records and case sheets. Serum levels of CRP, ferritin, Interleukin -6, lymphocytes, platelets, creatinine, liver enzymes were assayed before and after the TCZ administration. Results Patient treated with TCZ had comorbidities, along with hematological and biochemical abnormalities. 12 patients (18%) benefited from TCZ and 54 patients died. There was significant lymphopenia on the day of TCZ administration – average 5.6% (2-9%) but the average TLC was within normal range In the survivors, CRP decreased dramatically 60.3 % (10-90%) within 2-4 days of TCZ administration. There was a marked decrease in Ferritin and IL-6 also, 20.5% (9.7 – 40%) and 25.5% (6-42%) respectively. Conclusion: Blocking excessive IL-6 production might be the key to the COVID -19 ARDS treatment. In our study, treatment with TCZ resulted in favorable evolution in only 18%of cases. Inflammatory biomarkers decreased in survivors as early as 4th day after TCZ administration. The low favorable outcome could be because of the comorbidities.

Keywords : SARS-CoV-2, COVID-19, CRP, ferritin, Tocilizumab, IL-6, acute respiratory distress syndrome, cytokine storm

PP-184

Nyctanthes arbor-tristis: a Wonder Plant for Drug Development

Rajender Pal Singh, Sumanpreet Kaur

Department of Experimental Medicine and Biotechnology, PGIMER, Chandigarh 160012
Email: s_rajendrapal@yahoo.com
sumankamboj436@gmail.com

Introduction : Nyctanthes arbor-tristis contains several active compounds that are beneficial for human health. Objectives: Arbortristosides A & B and iridoid glucoside are known to be present in various parts of Nyctanthes arbor-tristis. Methodology: In this study we have examined the interaction of these molecules with HMG- CoA reductase by in-silico experiments. Results: It is observed that this compound reacts with active site of HMG-CoA reductase. Conclusion: Arbortristosides A & B and iridoid glucoside are potential candidates to be further validated for hypolipidemic drug development.

Keywords : Nyctanthes, Arbortristosides, glucosides, drug

PP-185

Biochemical and Clinical Risk Factors for Mortality in COVID-19 Patients in ICU: A Single-Center Retrospective Study

M.Noorjahan, Sreedevi[1], KSS SaiBaba[1], Hajra[1], Sumayya[1], Archana[2], Siraj Ahmed Khan[1], Vijaya Bhaskar[1]

[1]Department of Biochemistry and [2]Anesthesia, Nizam's Institute of Medical Sciences, Hyderabad, Telangana, Email : m_noorjahan@yahoo.co.in

Objectives : This study aimed to evaluate the clinical and biochemical characteristics in COVID-19 affected healthcare workers admitted to NIMS Intensive care unit (ICU) including survivors and non-survivors to identify risk factors for mortality. Patients and Methods: We did a retrospective study of 78 healthcare workers with PCR-confirmed COVID-19 infection admitted in ICU between July and November, 2020. Patients were classified as survivor group and non-survivor group based on their outcome. Clinical and biochemical characteristics were compared. Logistic regression was

performed to analyze the risk factors of mortality. Results: Out of the 78 patients admitted to ICU, the majority were males (64%). Thirty six had history of DM (46%), 40 (51.3%) had HTN, 13(16.7%) COPD, 14(17.9%) CKD and 11(14%) had CAD. Median ICU stay was 6(2-15) days in survivors and 7(2-25) days in non-survivors. Dyspnea (50 cases) was the most common symptom. The parameters such as lymphocyte and platelet counts, hemoglobin levels, CRP, and liver and kidney function, IL-6, LDH, D-dimer, Procalcitonin, NTproBNP levels were significantly different between the groups. CRP and NTproBNP were significantly associated with mortality (p=0.01) as well as age (p=0.002) and CAD (p=0.004). Conclusion: Patients with lower lymphocyte counts and serum albumin, and high CRP, NTproBNP and also patients of older age with comorbidities (CAD) had high mortality. So, these factors should be given more attention in risk management in the progression of COVID-19 disease in ICU patients.

Keywords : covid-19, ICU, survivors, non-survivors

PP-186

Elucidating the Potential Role of Interleukin-33, sST2, and IgE in Asthmatic Patients

Himadri Singh[1], Alkesh Khurana[2], Ashok Kumar[1], Rohit Saluja[3]

[1]Department of Biochemistry, [2]Department of Pulmonary Medicine, All India Institute of Medical Sciences, Saket Nagar Bhopal
[3]Department of Biochemistry, All India Institute of Medical Sciences, Bibinagar, Telangana
E-mail: drrohitsaluja@gmail.com

Introduction : Asthma is characterized by reversible airflow obstruction, increased immunoglobulin(Ig) E production, infiltration of eosinophils to the lungs, and lower Force Expiratory Volume in 1s(FEV1).Various cells and cytokines play a critical role in exacerbating the inflammatory response in asthma. Interleukin-33 (IL-33) is a newly discovered cytokine that plays a major role in various inflammatorydiseases. IL-33 signals via a heterodimer composed of ST2 and IL-1 receptor accessory protein (IL-1RAcP). The role of IL-33 in asthma is not yet precisely explored. Objective: To estimate the serum levels of IL-33,soluble ST2 (receptor of IL-33), and IgE in asthmatic patients and healthy subjects and further analyzetheir correlation with clinical parameters such as absolute eosinophil count (AEC) and FEV 1. Material and Methods: A case-control study of 157 subjects was conducted, including 100 asthmatic patients and 57 healthy subjects. IL-33, sST2, and IgE were detected in the serum of asthmatic patients and healthy control by using ELISA kits. AEC was estimated by flow cytometry, andFEV1 was evaluated by spirometry. Results: In asthmatic patients, the serum level ofIL-33 and IgE were found to be significantly increased in asthmatic patients as compared to healthy subjects. However, the levels of sST2 were found to be lower in asthmatic patients. Conclusion: This study helps to understand the biological function of IL-33 and its receptor sST2 in asthma. IL-33 may be a novel inflammatory marker for asthma.

Keywords : Interleukin-33, Immunoglobulin E, Soluble ST2, Absolute Eosinophill count

PP-187

Augmented Rescue of Alpha 2- Macroglobulin Activity by Supplementation of Anti-snake venom with Methanolic Extract of Andrographis paniculata- Implications for the treatment of envenomation with Naja naja

Akshatha G. Nayak1, Nitesh Kumar, Smitha Shenoy3, Maya Roche1

1Department of Biochemistry, Melaka Manipal Medical College (Manipal Campus), Manipal Academy of Higher Education, Manipal, Karnataka, India

2 Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research (NIPER), Hajipur, Bihar, India

3Department of Pharmacology, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, Karnataka, India
Email: maya.roche@manipal.edu

Objectives : This in vitro study investigates the ability of the Indian polyvalent anti-snake venom (ASV), methanolic extract of Andrographis

paniculata (MAP) and their combination in preventing the inactivation of the pan-proteinase inhibitor a2-macroglobulin (a2MG) by Naja naja (N.N) venom. Methodology: Heparinized normal human plasma samples were divided into 5 groups: Normal control, venom control and 3Test (T) groups. T1 was 100 µl plasma + 25µg of N.N venom +ASV (25 µl -60 µl) or MAP (25-100 µg) or their combination (ASV 25 µl+ MAP 25-100 µg). In T2 and T3, plasma was incubated with venom for 30 or 90 minutes, prior to addition of ASV/MAP/ASV+MAP. All the samples were further incubated for 16 hours at 37?, after which chymotrypsin-bound esterase activity of a2MG was assayed. Results: N.N venom caused a significant decrease (55%, p=0.001, p= 0.05 was considered significant) in a2MG activity. Addition of ASV or MAP or ASV +MAP prevented the loss of a2MG activity maximally to the extent of 100%, 88%, 100% respectively in TI, 62%, 66% and 74% respectively in T II and 56%, 54% and 62% respectively in T III. In all groups, the prevention of loss of a2MG activity was found to be significant (p=0.001). Conclusion: Ability of ASV and MAP to prevent loss of a2MG activity was comparable. Reducing ASV concentration to a minimum and supplementing with MAP, augmented the rescue of a2MG. This strategy if used in the treatment of envenomation could also reduce allergic and anaphylactic reactions associated with higher doses of ASV.

Keywords : andrographis, macroglobulin, snake, venom

PP-188

Interplay Between Coagulopathy and Inflammation in Covid 19 Patients

Shailata Prisi, Binita Goswami,
Lal Chandra, Bidhan Chandra Koner

Department of Biochemistry, Maulana Azad Medical College, New Delhi, India

OBJECTIVE : COVID 19, caused by severe acute respiratory syndrome coronavirus 2(SARS CoV 2), is a systemic disease. Most of the patients have mild to moderate symptoms and recover quickly; however, in some patients severe respiratory symptoms develop. Although increased inflammatory markers and abnormal coagulation profile are both related to severity and mortality in COVID19, but yet no definitive relation between them has been established so far. METHODS: The laboratory data of already processed samples of 199 COVID-19 positive patients admitted in our dedicated COVID care facility were analyzed for statistical association between the inflammatory markers and coagulation factors. Confidentiality of patients was maintained. The serum samples were processed on Cobas e411 for inflammatory markers. The coagulation profile was done on plasma samples on ACL Elite pro. IBM SPSS V23 software, Chicago was used for statistical analysis of data. RESULTS: 199 samples were categorized into mild (36), moderate (76) and severe (87) COVID19 cases. When compared between mild to severe cases significant increase was seen in all three parameters (IL6 p=0.015, Ferritin p=0.006 and d dimer p=0.002). However, significant increase was seen only for IL6 (p=0.008) and d-dimer (0.048) with positive correlation ($p<0.05$, r=0.296) on comparison between moderate and severe cases. CONCLUSION: In COVID19 patients there is synergistic interaction between the inflammatory response and coagulation system. Thrombin (activated factor II) has pro-inflammatory action. Similarly, IL6 induces the release of acute phase reactants like C-reactive protein, fibrinogen. Because of this interplay, patients with severe COVID19 are at a dual risk of inflammatory and

thromboembolic complications and need to be monitored stringently for the same.

Keywords : COVID19, Inflammatory markers, IL6, Ferritin, Coagulation Profile, D-dimer

PP-189

Chronic Opioid Use and Haematological Parameters

Rizwana Quraishi[1], Preethy Kathiresan[2], Ravindra Rao[1], Raka Jain[1]

[1]*National Drug Dependence Treatment Centre, Department of Psychiatry*

All India Institute of Medical Sciences, Delhi, India.
[2]*Department of Psychiatry, All India Institute of Medical Sciences, Jodhpur, India,*
Email: Rizwanaquarishi@gmail.com

Opioid use for a longer duration of time may impact the biological functioning of the user. The harmful effects of opioids includes alternations in the hematopoietic and immune system. This report aims to understand the impact of long term opioid use on various haematological parameters of treatment seeking population. Methodology The study was carried out at a leading drug dependence treatment center in North India. The collection of data was done in a retrospective manner for opioid dependent (ODS) males and healthy controls (HC) who visited the laboratory for haematological investigations. Clinical records were reviewed for opioid use details like type and duration. Detailed haematological profile was retrieved from the lab records. The data was presented as Mean or median. Mann Whitney U test was used to compare the haematological parameters between the cases and controls. Results The study included 191 ODS patients and 123 controls. The mean age of the patients and control were 28.5 (SD:8.8) and 32.2 (SD: 10.6) years respectively. Heroin was the most common (92.1%) opioid used. Tobacco use was used by 90% of the Patients. A significant decrease in the levels of haemoglobin, MCV, MCH, monocytes and platelet, while a significant increase in the lymphocyte levels was observed among ODS patients when compared to controls. Conclusion Chronic opioid use has a significant effect on the hematopoietic cells. It augments the need of regular haematological investigations as an integral part of the opioid care treatment services.

Keywords : Opioids, Chronic Use, Hematology, Platelets

PP-190

A study of Serum Magnesium and Calcium Levels in Asthmatic Patients

Mukesh kumar Jat, Diksha Singh, Sandhya Mishra

Department Of Biochemistry, SMS Medical College, Jaipur
Email: dr.mukeshjat@gmail.com

AIM AND OBJECTIVES : To assess the serum Magnesium and serum calcium level in patients with asthma and compare them with healthy controls.

METHODOLOGY : A Case-control study was performed in Biochemistry department in collaboration with Pulmonary and Allergy department at SMS Medical college and attached Hospitals, Jaipur. 40 Asthmatic patients of either gender or age more than 18 years were enrolled in the study.

RESULT : In this study low Magnesium levels were observed in patients with asthma (1.59±0.47mg/dl) as compared with healthy controls (1.88±0.39mg/dl) and low serum calcium levels were found in patients (8.88±0.70 mg/dl) as compared to healthy controls (9.21±0.49 mg/dl). P values are <0.005 and <0.01 respectively.

CONCLUSION : This study shows that asthmatic patients had significant hypomagnesemia and hypocalcemia in comparision to age and gender matched healthy controls. Level of these analytes should be monitored in asthmatic patients and should be corrected if found low.

Keywords : Asthma, Hypomagnesemia, Hypocalcemia, Students-t-test

PP-191

Lipid Profile Alteration in SARS Coronavirus 2 (SARS-CoV-2) Affected Patients and Its Association with Inflammatory Markers

Seema Patel, Gini Garima,
Thakur Nidhi, S.B Sharma

Department of Biochemistry, ESIC Medical College and Hospital, Faridabad, Haryana, India,121001
dr.seemapatel16@gmail.com

Introduction Coronavirus disease 2019 (COVID-19) caused by the SARS coronavirus 2 has challenged the global healthcare system since 2019. Lipids are integral component of this enveloped virus that play an essential role in in its life cycle starting from fusion of viral membrane to host cell, viral replication and exocytosis. It also disrupts metabolic profile due to the release of pro-inflammatory cytokines leading to systemic inflammation reaction. Aim and Objective Therefore, it was aimed to find association between human host serum lipid levels and its association with inflammatory markers. Materials and Methods It was a retrospective study conducted from June 2020 to December 2020, included 500 COVID-19 admitted patients tested positive by Oral/Nasopharyngeal swab by Real time PCR. Total Cholesterol, Triglycerides (TG), Low Density Lipoprotein (LDL-C), High Density lipoprotein (HDL), Ferritin, Procalcitonin (PCT), High sensitive C Reactive protein (hsCRP) estimated in Vitros XT 7600 Autoanalyzer and Interleukin-6(IL-6) by ELISA. Results A significant increase in Serum Triglycerides(185mg/dL) and decrease in HDL-C(30mg/dL) was observed with no remarkable finding in other lipid parameters. A statistically significant ($p<0.05$)positive correlation was observed between TG and inflammatory markers such as hsCRP, PCT, Ferritin, IL-6. Likewise, a negative correlation was detected between HDL-C and hsCRP, PCT, Ferritin, IL-6. Conclusion Lipid profile and host cell metabolism is altered in COVID 19 patients either by cellular infection or by systemic inflammation. Hence it is important to study lipid profile alterations in synergism with inflammatory markers. It may act as guiding step in management and prognosis of this disease.

Keywords : COVID-19, Lipid profile, Inflammatory markers, Procalcitonin

PP-192

Assessment of Clinico Radiological and Biochemical Markers of Rickets, a Hospital Based Prospective Study

Sanjay Kumar[1], Abha Jyoti[2], Tushar Chaurasiya[1], Rajesh Kumar[1], Nadeem Ashraf Khan[1]

[1]Dept. of Orthopaedics, [2]Dept of Biochemistry, GSVM Medical College Kanpur 208002
Email id: verma.abha78@gmail.com

OBJECTIVES : To study the sequential changes of clinical, radiological & biochemical markers in rickets patients. Methods: 101 cases of nutritional rickets in age group 6 month to 18 years were allocated to receive combination therapy of calcium and vitamin-D according to age / weight during a study period of 24 weeks. Radiographs and biochemical parameters clinical features were evaluated at presentation, 6, 12, 18 and 24 weeks and response of treatment and markers were assessed at subsequent interval.

STATISTICAL ANALYSIS : Chi square test, ANOVAs.was used. A P value of <0.05 was considered statistically significant. using SPSS version 21.0. Results: At presentation, the mean dietary intake of calcium (6.11±0.78mg/dl) , Mean vitamin-D level was (23.05±8.14 ng/ml) was low in all cases indicative of both deficiency. After 24weeks evidence of healing was observed in all markers. Normal serum alkaline phosphatase and radiological healing at 12 weeks was observed in 75% subjects with improvement of all markers. Conclusion: After intervention of combination regimen of calcium and vitamin-D, remarkable improvement in clinical, radiological and biochemical markers were found.

Keywords : Rickets, Clinico-radiological, Biological marker

PP-193

miRNA 146a and Inflammatory Cytokines in Welders of Western India

Sharma S[1], Mitra P[2], Goyal T[1],
Rana S[3], Saikiran G[4], Sharma P[1]

[1]*Department of Biochemistry, All India Institute of Medical Sciences, Jodhpur, India*

[2]*Department of Biochemistry, PGIMER, Chandigarh, India*

[3]*Department of Physical and Natural Sciences, FLAME University, Pune, India*

[4]*Department of Biochemistry, Vijaya Diagnostic Centre, Hyderabad, India*
Email:shailjachambial@yahoo.com

In developing countries, small scale industry workers continue to be exposed to deleterious effects of Pb which induces inflammatory processes by modulating intracellular signaling cascades.

Objective : We aimed at estimating miRNA 146a and inflammatory cytokines IL-6,TNF alpha in Pb exposed individuals. Methodology: 100 chronically Pb exposed workers consented for the study. Blood Pb levels (BLL) were analyzed using Atomic Absorption Spectrophotometer (ICE 3500 Thermofischer). Quality control was assured using Bio-Rad (Lyphochek® Whole Blood Metals Control). miRNA 146a expression was assessed using Qiagen kits. IL-6 andTNF alpha were measured by commercially available ELISA kits. Results: Mean ± SEM BLL in occupationally exposed population was 6.51±1.21 µg/dl. Study population was further divided into low lead level (<3.5 µg/dL) and high lead level (>3.5µg/dL) group. Mann Whitney U test revealed significant differences in relative expression of hsamiR-146a-5p between high Pb and low Pb group ($p<0.05$). Sub analysis of interleukins between high Pb and low Pb group revealed statistically significant differences in IL-6 and TNF-α levels ($p<0.0001$). Conclusion: Occupational Pb exposure may contribute towards inflammatory and epigenetic processes.

Keywords : Blood lead Level, IL-6, TNF alpha, miRNA

PP-194

Comparison of Various Severities Scoring System in COVID19 Patients

A Hariharan

Biochemistry, 7B, Vaigai block, Velammal Medical College Hospital and Research Institute, Auppanadi, Madurai -625009.
E mail: ahariharan.in@gmail.com

Objective : Several early warning score has been postulated to predict the severity and outcome in COVID 19 patients. In our study we try to find out which one of the following is a better scoring system in predicting the severity in COVID-19 patients-modified NEWS (National Early Warning Score), HEWS (Hamilton Early warning score) and ANDC (Age, neutrophil-to-lymphocyte ratio, d-dimer and C-reactive protein) scoring system. Materials and methods: It was a retrospective study. Data were collected from files of RT PCR positive patients who got admitted in our college. Patient severity was based on patient transfer to intensive care unit. Age, AVPU score, temperature, respiratory rate, heart rate, blood pressure D-dimer, NLR ratio, C-reactive protein, oxygen saturation and oxygen support was collected from data base to calculate modified NEWS, HEWS and ANDC score. Results: There was no statistically significant difference in ICU (5.42± 2.26) and non-ICU(4.40±2.59) patients in modified NEWS scoring system($p=0.132$). There was statistically significant difference in ICU (3.00± 1.85) and non-ICU(1.89±1.34) patients in HEWS scoring system($p=0.025$). The ANDC scoring system also showed statistically significant difference between ICU (94.27± 83.91) and non-ICU patients (56.60±18.84) ($p=0.001$). ROC curve for HEWS scoring system is AUC: 0.678 with $p = 0.021$ (sensitivity: 57.9 %, specificity: 73.7%), ANDC scoring system is AUC: 0.746 with $p = 0.001$(sensitivity: 68.4 %, specificity: 56.1%). Conclusion: In our study we found that ANDC scoring system is a better scoring system to predict the severity in COVID-19 patients.

Keywords : COVID-19, scoring system, severity, modified NEWS, ANDC, HEWS score

PP-195

A Comparative Study of Serum Calcium, Magnesium and Phosphorus in Newly Diagnosed Patients of Hypothyroidism with Healthy Control at SMS Medical College & Hospital Jaipur

Sumana Kundu, Parmanand, Chitra Upadhyay

Department of Biochemistry, SMS Medical College, Jaipur
email: parmanandmarodia@gmail.com

Background : Hypothyroidism is the deficiency of thyroid hormones affecting 2-15% population worldwide. Relation of hypothyroidism with minerals is not clear and underlying mechanisms responsible for changes are unknown. Thus a comparative study on hypothyroidism cases and healthy controls was done.

Objective : To compare levels of serum calcium, magnesium, phosphorus in patients of hypothyroidism with healthy controls and correlate levels in cases of hypothyroidism with TSH. Materials and Methods: After taking due permissions, study was conducted in Department of Biochemistry and Endocrinology, SMS Medical College on 30 cases of hypothyroidism and 30 healthy controls. Serum Calcium, Magnesium, Phosphorus were analysed by Arsenazo III method, Xylidyl method, UV molybdate on automated analyser respectively.TSH was assessed by CLIA. RESULT: A significant decrease in serum calcium was observed in cases as compared to controls ($p<0.05$). A significant increase in serum magnesium and phosphorus was observed in cases compared to controls. CONCLUSION: Thyroid dysfunctions have an influence on renal hemodynamics, glomerular filtration and electrolyte handling and also have adverse effects on calcium homeostasis Frequent follow up and monitoring of these parameters in hypothyroidism will be of great help in its management.

Keywords : Calcium, Magnesium, phosphorus, Hypothyroidism, TSH, CLIA (chemiluminesence immunoassay)

PP-196

Study of Serum Calcium & Sodium Levels in Hypothyroidism – An Observational Study

Suguna R

Department of Biochemistry, Coimbatore Medical College, Coimbatore, Email : jhony.cezer@gmail.com

Thyroid hormone is a central regulator of body functions. Hypothyroidism is the commonest form of thyroid hormonal dysfunction. It occurs when there is deficiency and impaired activity of thyroid hormones. Disorders of thyroid function are considered to have a role in serum calcium and serum sodium levels. Objectives: The present study was undertaken to analyze and associate the serum calcium levels and serum sodium levels in hypothyroid patients.

Methodology : A Case Control study was done on 40 subjects of hypothyroid cases (20 cases of subclinical hypothyroidism and 20 cases of clinical hypothyroidism) and 40 healthy controls. Blood samples were collected from all the subjects, centrifuged and serum was separated. Serum T3, T4, TSH levels, Serum calcium, Serum albumin levels and serum sodium levels were estimated in all the subjects.

Results : This study showed the significant negative correlation between serum TSH and serum calcium levels ($P<0.05$) & serum sodium levels ($P<0.05$) hypothyroid cases when compared to controls. Conclusion: The present study indicated significant effects of thyroid hormonal dysfunction on serum calcium levels and serum sodium levels. Serum calcium level was significantly low in clinical hypothyroidism than subclinical hypothyroidism. Serum calcium levels and Serum sodium levels decreases with increase in amount of TSH which must be kept in mind during further follow up visits and assessment of levels of serum calcium and serum sodium levels is important for therapeutic supplementation to prevent progression of thyroid dysfunction and complications.

KEY WORDS : Hypothyroidism, serum calcium levels, serum sodium levels

P-197

Activated Carbon Fabric Mask Decreases the Blood Lead, Oxidative Stress and Improves the Antioxidant Status and Liver Functions of Battery Manufacturing Workers

Jyotsna A. Patil, Mandakini S. Kshirsagar, Arun J. Patil

Department of Biochemistry, Krishna Institute of Medical Sciences, Karad-415539, Maharashtra, India

Background : The regular use of activated carbon fabric mask decreases the lead toxicity in occupationally lead exposed population. Aim: The aim of this study to see the effect of regular use of activated carbon fabric mask on biochemical parameters of battery manufacturing workers (BMW).

Objectives : To measure the blood lead (PbB), serum lipid peroxide, erythrocytes-Superoxide Dismutase (SOD), Catalase, Ceruloplasmin and liver functions tests before and after use of activated carbon fabric mask of BMW. Material and Methods: For this study 36 male battery manufacturing workers were included and these workers were regularly using activated carbon fabric masks for two months. Blood was collected before and after activated carbon fabric mask and estimated the lead level, liver functions, oxidative stress and antioxidant status by using standard methods.

Results : After two months use of activated carbon fabric masks there is significant decrease in blood lead ($P<0.01$, -15.76%), serum total bilirubin ($P<0.05$, -28.09%), alanine transaminase ($P<0.05$, -20.84%) and increase serum total protein ($P<0.01$, 1.23%), albumin ($P<0.001$, 2.67%), albumin/globulin ratio ($P<0.01$, 2.29%), however, serum globulin and aspartate transaminase level were not significantly altered. Serum lipid peroxide was significantly decreased ($P<0.001$, -33.33%) and superoxide dismutase ($P<0.05$, 22.38%), catalase ($P<0.05$, 38.39%), ceruloplasmin ($P<0.05$, 13.13%) were significantly increased as compared to before using activated carbon fabric masks.

Conclusion : This study reflects use of activated carbon fabric masks is very useful to decrease the lead absorption, which results in to decreases the oxidative stress and improves the antioxidant status and prevents the liver toxicity.

Key Words: Activated Carbon Fabric Mask, Blood Lead, Liver Function Tests, Oxidative Stress, Antioxidant Status

PP-198

Effect of *Azadirachat indica* and *Momordica charantia* on Male Albino wistar rats and their anti-oxidant properties before and after the induction of type 2 Diabetes Mellitus by Streptozotocin

Sayed Aneesa, Badade Z.G

Department of Biochemistry, MGM Medical College, Kamothe, NaviMumbai,India
Email: aneesasayed23@gmail.com

Introduction : Diabetes is a chronic disorder affecting the population on epidemic level. Diabetes results from abnormal metabolism of insulin, wherein insulin action is impaired, or absolute insulin deficiency results in imbalance of glucose metabolism and leads to syndrome called diabetes mellitus. *Azadirachta indica* possess therapeutic role in heath management due to rich source of various ingredients. Neemhas free radical scavenging properties due to rich source of antioxidant. It alsobears antibacterial, antifungal, and anti-inflammatory properties. *Momordica charantia* Linn. (Cucurbitaceae) (MC) or Bitter gourd (Bitter melon) is atropical and subtropical vine. It is used in the Ayurvedic system ofmedicine for treating various diseases including diabetes mellitus. Aims and objective: To study the effect of A.indica and M.charantia in male wistar rats on inducing Type 2 DM. Material and methods: Male wistar rats were made diabetic by streptozotocin, which latter were treated with A.indica and M.charantia herbs and their combination. Results were obtained by histopathological and biochemical findings. Results: Anti-oxidant properties of A.indica and M.charantia were estimated by measuring their Catalase and SOD levels which resulted in increased levels and decreased MDA levels. Anti-diabetic properties were studied by various biochemical and histopathological findings on sacrificed wistar rat tissues. Conclusion: The finding of the study has shown anti-diabetic and anti-oxidant properties of A.indica and M.charantia on albino wistar rats before and after the induction of type 2 DM

PP-199

Functionalization of Gold Nanoparticles with Monosaccharide Mannose

Sambit Dash[1], Angel Treasa Thomas[2], Ullas Kamath[1], Aparna R Pai[3], Prasanna Kumar Reddy Gayam[2], Ekta Rati[2], Shivani[2] and Pragna Rao[4]

[1]*Department of Biochemistry, Melaka Manipal Medical College, Manipal Academy of Higher Education (MAHE), Manipal, India*

[2]*Department of Pharmaceutical Biotechnology, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education (MAHE), Manipal, India*

[3]*Department of Neurology, Kasturba Medical College, Manipal Academy of Higher Education (MAHE), Manipal, India*

[4]*Department of Biochemistry, Kasturba Medical College, Manipal Academy of Higher Education (MAHE), Manipal, India*
Email: sambit.dash@manipal.edu

Introduction : Gold nanoparticles have found a wide range of application in biomedical sciences. Various molecules have been functionalized on the gold nanoparticles surface but carbohydrates have garnered attention due to their properties and their role in living systems. However certain challenges make carbohydrate-gold nanoparticles association difficult to obtain and stabilize. Objective: This study was carried out to chemically remodel gold nanoparticles by adding a monosaccharide mannose to its surface. Methodology: A modified phase transfer method was used to synthesize gold nanoparticles. The surface of the nanoparticles was fixed with cyanuric chloride to serve as a linker. Mannose was then linked to the linker molecule. All three stages of the process, gold nanoparticles, and gold nanoparticles with linker and gold nanoparticles with the carbohydrate were analyzed for size and stability. Results: We synthesized gold nanoparticle of the average size 43.07 nm with zeta potential of - 11.2 mV. The addition of cyanuric chloride group increased the size and an average diameter of 57.02 nm was obtained, with zeta potential of -11.2 mV. On addition of mannose, the overall size of the molecule increased to an average of 257.7 nm, with a zeta potential of -28.9 mV, exhibiting good stability. Zeta potential and UV-vis data exhibited stable gold nanoparticles dispersion, successful binding of linker molecule as well as the carbohydrate. Conclusion: This study shows a simple, cost-effective and robust method of glycomodification of gold nanoparticles surface which can further find use in wide ranging applications.

COI statement : Authors declare no conflict of interest

PP-200

To study Lactate levels in tears of patients of various grade of myopia.

Dokwal S[1], Arya A[2], Sachdeva A[1], Rathee M[3], Sachdeva S[3], A Varun[4], Prakash G[1]

[1]*Department of Biochemistry,* [3]*Department of Ophthalmology,* [4]*Department of Community Medicine, Pt. B.D. Sharma PGIMS, Rohtak*
[2]*General Hospital Bahadurgarh, Jhajjar.*
Email id: drsumitdokwal80@gmail.com

Objective : To study Lactate levels in tears of patients of various grade of myopia. Methodology: The present study was a hospital based case control study conducted on Twenty five patients each with mild myopia (Group 1), moderate myopia (Group 2), high myopia (Group 3), age and sex matched healthy controls (Group 4). Diagnosis was established with help of detailed history, clinical and ocular examination. Lactate levels were estimated in tear samples by enzymatic method on auto analyzer within thirty minutes of collection.

Exclusion criteria : Patient having glaucoma, any systemic disease, any surgery or trauma to eye with in 1 month of presentation, any major illness like liver disease, cancer, in intensive care unit, any form of local or systemic steroids and or sex hormones, any antioxidant supplementation

Result : Age was comparable in all the four groups; Lactate levels in tears are high in myopia patients as compared to controls; Lactate in tears was increased in the various degree of myopia patients as compared to the controls.

Observation : The increases in the levels of lactate in tears were directly proportional to the degree of myopia. The increase was statistically significant ($p<0.05$) in moderate and severe degree of myopia. Tears can be used as a non invasive method to study various oxidative and

other markers for this purpose. Further studies with more oxidative markers in tears can also be compared with blood values in larger groups of patients with long term follow up to validate the finding.

Keywords : Mypoia, Lactate, Oxidative, Tears

PP-201

Pseudoesterase Activity of Human Serum Albumin: A Promising Approach to Detect Microalbuminuria

Deepak Kumar[1]*, Sakshi Behal[2],
Rajasri Bhattacharyya[1], Dibyajyoti Banerjee[1]

[1]*Department of Experimental Medicine and Biotechnology*
[2]*Department of Obstetrics and Gynaecology, PGIMER, Chandigarh 160012*
Email Id: deepakk1812@gmail.com

Introduction : The human serum albumin (HSA) is known to possess low turnover esterase activity (PMID: 33379110). The Tyr411 is considered as an important residue for such activity (PMID: 29685194). The aim of the study was to develop a method for detection of microalbuminuria using the pseudoesterase activity of HSA.

Objectives : The objectives were: 1. Identification of a suitable substrate for HSA pseudoesterase activity. 2. Development of a method to detect HSA on the basis of its pseudoesterase activity with the selected substrate and validation of such method.

Methodology : The *in-silico* tools of computational biology were used to find/screen a suitable substrate for HSA pseudoesterase activity. The screened substrate was then validated in-vitro and method was developed to detect HSA using its pseudoesterase activity. The developed method was further validated with urine matrix.

Result : The screened substrate interacted well with HSA and the obtained enzymatic parameters also attest the same fact. The developed method detected as low as 0.1 µM of HSA. It also detected microalbuminuria. Conclusion: The pseudoesterase activity based detection method of HSA can be used to detect microalbuminuria.

Keywords : Human serum albumin, Microalbuminuria, Pseudoesterase activity

PP-202

HbA1c may be Imprecise Marker to Forecast Renal Failure in Diabetic Subjects

Palem Siva Prasad

Department of Biochemistry, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, Telangana, India, Email ID: sp.biocom@gmail.com

Objectives : The study intended to evaluate the correlation of HbA1c with renal function markers in type 2 diabetic subjects.

Methodology : This is a retrospective study, 138 type 2 diabetic subjects' data were collected from Clinical Biochemistry Laboratory at Chalmeda Anand Rao Institute of Medical Sciences & Hospital, Karimnagar, India. The subjects are with the age group of 35 – 65 years, among these subjects 102 are T2DM and remaining 36 were diabetic nephropathy subjects. Biochemical parameters like urea and creatinine are estimated by well-established methods, HbA1c was estimated by immunoturbidimetric method and eGFR was calculated by using Modification of Diet in Renal Disease (MDRD).
Results : A significant difference of urea, creatinine and eGFR were shown among type 2 diabetic subjects with and without nephropathy. But there was insignificant difference in the level of RBG and HbA1c among the study groups. We also observed that no correlation of HbA1c with eGFR, urea and creatinine in the study subjects.

Conclusions : We found HbA1c has no correlation with eGFR, creatinine and urea, hence it may not be considered as precise maker to predict renal dysfunction in type 2 diabetic subjects.

Keywords : Glycated Haemoglobin (HbA1)

PP-203

DHEAS/ Cortisol Ratio Acts As A Better Surrogate Marker Of Inflammation Than DHEAS or Cortisol in Patients with COVID-19

Sojit Tomo[1], Mithu Banerjee[1]*,
Sreenivasulu Karli[1], Purvi Purohit[1],
Prasenjit Mitra[1], Praveen Sharma[1],
MK Garg[2], Bharat Kumar[2]

[1]Department of Biochemistry, [2]Department of Medicine, All India Institute of Medical Sciences, Jodhpur, INDIA
Email: sojitomo@gmail.com

Objective : Dehydroepiandrosterone sulfate (DHEAS) was observed to be decreased in sepsis and inflammatory conditions. The severity of inflammation was found to be associated with a low DHEAS/cortisol ratio. In the present study, we compared DHEAS, cortisol, and DHEAS/cortisol ratio to assess which is a better marker for inflammation in patients with COVID-19. Methodology: This was an analytical cross-sectional pilot study conducted from April 2020 to Dec 2020. The study recruited 76 RT-PCR positive COVID-19 positive patients. The blood samples were collected were analyzed for cortisol and DHEAS. Highly sensitive C-reactive protein (hs-CRP) levels were estimated to assess the inflammation. Results: We classified the cases into two groups based on the median levels of DHEAS, cortisol, and DHEAS/cortisol ratio. We observed hs-CRP to be elevated in the groups which have the levels of DHEAS, cortisol, and DHEAS/cortisol ratio lower than the respective medians. However, a significant difference in hs-CRP levels was observed only between DHEAS/cortisol ratio (p value= 0.0204) and not between DHEAS and cortisol groups. Conclusion: The present study is the first of its kind comparing the DHEAS levels and DHEAS/ cortisol ratio in COVID-19. The study concludes DHEAS/cortisol ratio to be a better marker than individual DHEAS or cortisol in the assessment of inflammation in COVID-19 patients.

PP-204

Whether Anti-Coagulants Cause Hemolysis: A Question Relevant For Estimation of Biomolecules From Plasma Samples

Surender*[1], Sumanpreet Kaur[2],
Deepak Kumar[2], Sheemona Chowdhary[2],
Rajasri Bhattacharyya[2], Rupesh Kumar[1]
and Dibyajyoti Banerjee[2]

[1]Department of Cardio Thoracic and Vascular Surgery, [2]Department of Experimental Medicine and Biotechnology, PGIMER, Chandigarh
**Email Id: surendersehrawat6@gmail.com*

Introduction: Plasma samples are commonly used in clinical laboratories for the estimation of various analytes. Several anti-coagulants are used for such purposes. It is incompletely understood as on date that the anti-coagulants per se cause hemolysis or not. Objectives: Here, we have tried to understood that commonly used anti-coagulants cause hemolysis or not. Methods: *In-silico* and *in-vitro* approaches are explored to work out the objectives.

Results : We have seen that heparin causes hemolysis.

Conclusion : There should be a detailed study that heparin-induced hemolysis causes interference in estimation from plasma samples or not.

PP-205

In-Silico Studies Of Phosphine with Mitochondrial Complexes: A Step towards the Finding A Biomarker of Aluminum Phosphide Poisoning

Deepak Yadav*, Sheemona Chowdhary,
Deepak Kumar, Rajasri Bhattacharyya
and Dibyajyoti Banerjee

Department of Experimental Medicine and Biotechnology, Postgraduate Institute of Medical Education and Research, Chandigarh 160012
**EmailId:dr.dpkydv@gmail.com*

Introduction : Aluminum phosphide (AlP) poisoning is a public health concern. AlP liberates phosphine. So, the biomarker of phosphine exposure is sin qua non of the biomarker of AlP poisoning. In this context, we have already hypothesized that plasma mitochondrial

enzymes are possible biomarkers of phosphine exposure. (PMID: 34077754).

Objective : To study interaction of phosphine with the mitochondrial electron transport chain complexes.

Methodology : *In-silico* study is performed via Autodock software for docking studies and Gromacs software for Molecular Dynamic simulation. Results: It is observed that phosphine interacts with the studied proteins.

Conclusions : Phosphine exposure can cause mitochondrial toxicity. That can cause mitochondrial enzymes to leak out, and so plasma mitochondrial enzymes may act as a biomarker of phosphine exposure.

Keywords : Toxicity, Biomarker, Aluminium phosphide

PP-206

The Structural Alteration of ct-DNA Persuades Through Methyl Methane Sulfonate Generate Methylated ct-DNA and Produce Loss of Its Structural Conformation of DNA To Frizzeled Backbone

Mohd Mustafa, Safia Habib, Asif Ali,
Shahid Ali Siddiqui, Moinuddin

Department of Biochemistry, Faculty of Medicine, Jawahar Lal Nehru Medical College, Aligarh Muslim University, Aligarh (202002)
Email: mohdmustafagc7251@gmail.com

Objectives : The aim of this study is to analyse the structural and conformational alterations on calf thymus DNA (ct-DNA) upon treatment with methyl methanesulfonate (MMS) using biophysical and computational methods.

Methodology : The changes induced by MMS on ct-DNA were studied through various biophysical techniques like: S1 nuclease assay, UV-vis, FT-IR spectroscopy, ITC, scanning and transmission electron microscopy. Interaction between DNA and MMS at molecular level was assessed through computational methods like Molecular docking and MD simulation. Results: MMS causes ct-DNA damage in a dose dependent manner. Spectroscopic approaches and gel electrophoresis research observed MMS induced methylation bring out conformational change, DNA fragmentation and lessened ct-DNA stability. MMS prompted single-stranded strands in the DNA were observed in nuclease S1 assay. Denaturation of DNA is observed by UV-vis spectra. FT-IR results stipulated MMS mediated direct-strand breaks in DNA. Threadlike aggregates in MMS-DNA shown by the ITC. Molecular docking found MMS in a close contact with the ribose sugar of DNA backbone possess non-bonded interactions. Molecular dynamic simulations confirmed that MMS is capable of interacting with DNA at two levels, one at the level of nitrogenous bases and another at the DNA backbone.

Conclusion : The results of the present study confirmed that bases of the DNA are nucleophilic centre for the methylation upon MMS treatment. The methylated DNA is mutagenic in nature and its high levels may lead to mutations in DNA molecule which can lead to cancer progression.

Keyword : ct-DNA, MMS, methylation, mutations

Index