

# Serum Copper Levels in Patients with Carcinoma of Oral Cavity

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## Introduction

Serum Copper level has been found to be elevated in various conditions such as cancer,<sup>1</sup> acute infections<sup>2</sup> and pregnancy<sup>3</sup>. Different types of cancers such as carcinomas, sarcomas and lymphomas show elevated serum copper levels<sup>4-7</sup>. A recent study<sup>8</sup> indicate the usefulness of Serum Copper level measurements on monitoring the clinical status of the patients with non Hodgkins lymphoma.

Cancer of the oral cavity is one of the commonest kinds of cancer found in India. Despite that, only scant information is available on the biochemical changes occurring in this type of cancer. Therefore, the present study was undertaken (1) to find out the changes of serum copper levels in oral cancer patients and (2) to evaluate the usefulness of serum copper measurement in assessing the clinical status of the disease in these patients.

## Materials and Methods

Twenty five patients with proven diagnosis of oral cancer at the Regional Cancer Center of Trivandrum Medical College were included in this study. Eleven of the patients were females (age 40 — 60) and 14 males (age 25 - 64). All the patients were clinically diagnosed as in various stages of the disease and were undergoing chemotherapy or radiation therapy. Age and sex matched normal controls were obtained (8 females and 10 males) from the laboratory or hospital staff for comparison.

Blood samples were collected, and the separated serum were stored at — 20°C. Serum copper levels were assayed by the method of Ventura and King<sup>9</sup>. The values are expressed as  $\mu\text{g/dl}$ .

## Results and Discussion

The range of serum copper varied from 139 — 283 in oral cancer patients (Mean 183  $\mu\text{g/dl}$ ). In the control group, the values were in the range of 78 — 156 with a mean of 103  $\mu\text{g/dl}$ . As can be seen from Table I, there was a significant increase in the level of serum copper in oral cancer patients as compared to normals. Figure I shows the individual serum copper values of Oral Cancer patients and normal controls, as a function of age. There is no correlation between the age and serum copper levels but an increased serum copper level for oral cancer patients can be observed.

Table I  
 Concentration of Serum Copper in normal subjects  
 and in Oral Cancer Patients  
 (expressed as  $\mu\text{g/dl}$ )

Group	Number of cases	Range	Mean $\pm$ SEM
Normal	18	78 to 156	103 $\pm$ 22
Oral cancer patients	25	139 to 283	183 $\pm$ 35

( $p < 0.001$ )

Table II shows the relation of the concentration of serum copper with the clinical stages of the disease. The present study does not reveal any correlation for serum copper with the clinical stages of the disease.

Serum copper level is a relatively non-specific but fairly reliable indicator of diseased state<sup>8</sup>. It has been

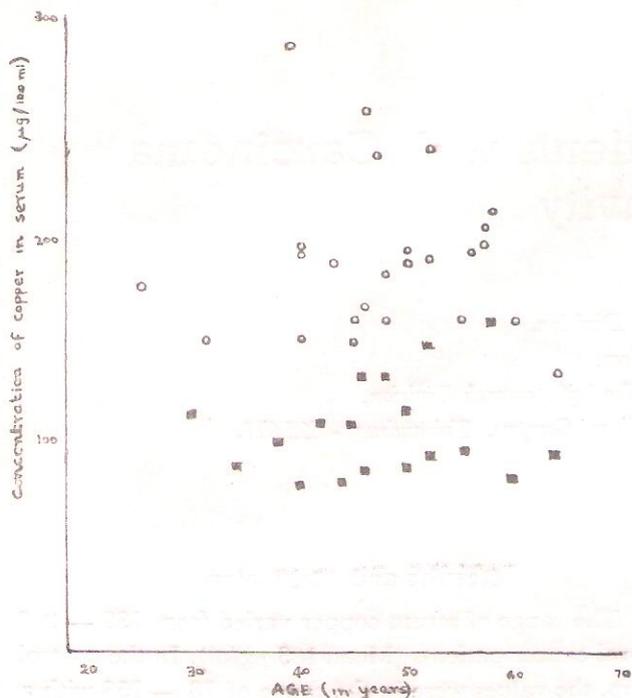


FIGURE 1

Concentration of copper in serum of oral cancer patients (O) and normal subjects (X) plotted as a function of age

Table II  
Relation between concentration of serum copper with clinical staging of the disease (Expressed as  $\mu\text{g}/\text{dl}$ )

Stages	Number of cases	Range	Mean
I	8	167 — 251	181.2
II	8	139 — 231	185.3
III	6	142 — 283	190.6
IV	3	147 — 235	179.6

suggested that the elevation in serum copper level in malignancy is due to the destruction and necrosis of the tissues leading to the release of copper present in the affected tissues into the circulation. The usefulness of serum copper measurement in the Clinical diagnosis of

certain kinds of lymphomas is well established<sup>8,10</sup>. The results of the present study indicate that in oral cancer patients also, the increase in the serum copper values are highly significant from that of controls. The absence of a correlation between serum copper values with the different stages of the disease may be due to the relatively slow spreading nature of this kind of cancer. Although the number of patients in this study are relatively small, we conclude that serum copper level is definitely elevated in oral cancer patients and that this parameter cannot be used as a monitor of the status of disease activity.

### Summary

Serum Copper levels in 25 patients with different stages of oral cancer have been studied and compared with 18 age and sex matched normal controls. Sera of patients showed a mean value of  $183 \mu\text{g}/\text{dl}$  (range 139 - 283) whereas the corresponding normal controls value was  $103 \mu\text{g}/\text{dl}$  (78 - 156). The results indicate that the serum copper levels are elevated in oral cancer patients but this increase does not correlate with the different stages of the disease.

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