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# Original Research

## Evaluation of salivary copper levels in oral leukoplakia patients

Priyanka Raghav

Associate Professor, Department of Oral Pathology & Microbiology, Subharti Dental college, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh, India

***ABSTRACT:***

**Background:** Evaluation of salivary copper levels in oral leukoplakia patients. **Materials & methods:** 50 oral leukoplakia patients and 50 healthy controls were enrolled. Complete demographic and clinical details of all the patients was obtained. Salivary samples were obtained from all the patients and was sent to laboratory where auto-analyser was used for evaluation of salivary copper levels. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:** Mean age of the patients of the oral leukoplakia group and control group was 41.5 years and 43.8 years respectively. Among the patients of the oral leukoplakia group, there were 31 males 19 females while in control group, there were 28 males and 22 females. Mean salivary copper levels among the patients of oral leukoplakia group and control group was 38.41 ppb and 8.12 ppb respectively; on comparing the results were found to be statistically significant. **Conclusion:** Salivary copper levels are significantly altered in oral leukoplakia patients.

**Key words:** Leukoplakia, Copper

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**Corresponding author**: Priyanka Raghav, Associate Professor, Department of Oral Pathology & Microbiology, Subharti Dental college, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh, India

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### INTRODUCTION

In developing nations, oral cavity cancer is the most prevalent neoplasm. When compared to other regions of the world, Kerala, South India, has an extremely high incidence of oral cancer. Corresponding to this, there is a relatively high occurrence of precancerous lesions of the oral cavity including oral leukoplakia and oral submucous fibrosis. Its high incidence's cause is not well understood. The high occurrence was linked to a number of things, including smoking, chewing, and viral illnesses. There isn't much information accessible about the biochemical and immunological derangements, regardless of the potential causes.[1- 3] Many in-depth investigations have examined the involvement of specific trace metals, in the pathology of numerous disorders. The two trace elements that have been most thoroughly researched in patients with cancer is copper. These elements have been discovered to be reliable indicators for diagnosis and prognosis in cases with craniofacial cancers. Because to recent technical developments, saliva can now be used to diagnose a variety of conditions, including hormone imbalances, liver function, immunodeficiency, and even cancer.[4- 6] Hence; the present study was conducted for evaluating salivary copper levels in oral leukoplakia patients.

### MATERIALS & METHODS

The present study was conducted for evaluating salivary copper levels in oral leukoplakia patients. 50 oral leukoplakia patients and 50 healthy controls were enrolled. Complete demographic and clinical details of all the patients was obtained. Salivary samples were obtained from all the patients and was sent to laboratory where auto-analyser was used for evaluation of salivary copper levels. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

### RESULTS

Mean age of the patients of the oral leukoplakia group and control group was 41.5 years and 43.8 years respectively. Among the patients of the oral leukoplakia group, there were 31 males 19 females while in control group, there were 28 males and 22 females. Mean salivary copper levels among the patients of oral leukoplakia group and control group was 38.41 ppb and 8.12 ppb respectively; on

comparing the results were found to be statistically significant.

**Table 1: Demographic data**

| Variable | Oral leukoplakia group | Control group |
|---|---|---|
| Mean age (years) | 41.5 | 43.8 |
| Males | 31 | 28 |
| Females | 19 | 22 |

**Table 2: Comparison of salivary copper levels**

| Salivary copper level(ppb) | Oral leukoplakia group | Control group | p-value |
|---|---|---|---|
| Mean | 38.41 | 8.12 | 0.000* |
| SD | 12.39 | 3.27 | |

*: Significant

## DISCUSSION

India has one of the highest incidences of oral cancer in the world. The development of cancer is a multistep process arising from pre-existing potentially malignant lesions. Oral leukoplakia (OL) is the most common precancer representing 85% of such lesions. Alcohol, viruses, genetic mechanisms, candida and chronic irritation have modifying effects in the etiology of oral cancer. Trace elements are regarded as versatile anti-cancer agents that regulate various biological mechanisms. Many researchers have observed association between trace elements and cancer mortality.[7- 9] Hence; the present study was conducted for evaluating salivary copper levels in oral leukoplakia patients.

Mean age of the patients of the oral leukoplakia group and control group was 41.5 years and 43.8 years respectively. Among the patients of the oral leukoplakia group, there were 31 males 19 females while in control group, there were 28 males and 22 females. Mean salivary copper levels among the patients of oral leukoplakia group and control group was 38.41 ppb and 8.12 ppb respectively; on comparing the results were found to be statistically significant. Shetty SR et al evaluated the levels of copper, zinc and iron in saliva of patients with oral leukoplakia, oral submucous fibrosis and oral squamous cell carcinoma. There was a highly significant increase in the level of salivary copper in oral submucous fibrosis patients when compared to controls (P = 0.001). Salivary copper levels were also elevated in oral leukoplakia and oral cancer patients (P = 0.01). There was a significant decrease in the salivary zinc levels in all three study groups when compared to controls (P = 0.001). A highly significant reduction in salivary iron levels was noticed oral submucous fibrosis group. The copper to zinc ratio significantly increased in all the study groups when compared to controls. Results suggested that salivary copper zinc and iron could be used as biomarkers for oral precancer and cancer.[10]Ayinampudi, B. K., et al evaluated the levels of copper and zinc and copper/zinc ratio in saliva of premalignant and malignant lesions of oral cavity, because of the anatomical proximity of the saliva to both premalignant and malignant oral neoplasms. The levels of copper and zinc were estimated in the saliva of 5 patients with oral submucous fibrosis, 5 patients with oral leukoplakia, 5 patients with oral lichen planus and 10 patients with oral squamous cell carcinoma of oral cavity using inductively coupled mass spectrometry (ICP- MS). The values were compared with 6 normal age and sex matched control subjects. There was significant difference of the mean salivary copper and zinc levels of premalignant and malignant lesions when compared to the normal controls. In oral cancer patients there was significant difference in the copper levels according the histodifferentiaton in squamous cell carcinoma. Within the premalignant group the copper levels were more in the oral sub mucous fibrosis when compared to the leukoplakia and lichen planus. Copper zinc ratio decreased in premalignant and malignant group when compared to the normal group. Saliva may be used as a potential diagnostic tool, which can be efficiently employed to evaluate the copper and zinc levels in pre malignant and malignant lesions of oral cavity.[11]

## CONCLUSION

Salivary copper levels are significantly altered in oral leukoplakia patients.

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