

## ORIGINAL RESEARCH

### Comparison of serum uric acid levels in oral potentially malignant disorders and oral squamous cell carcinoma

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#### ABSTRACT:

**Background:** Many oral squamous cell carcinomas develop from potentially malignant disorders (PMDs). Several lines of evidence, including clinical, experimental and morphological data, support the concept that squamous cell carcinoma of the upper aerodigestive tract arises from noninvasive lesions of the stratified squamous epithelium. Hence, the study was undertaken to evaluate serum uric acid in oral cancer patients and patients with oral potentially malignant disorders. **Materials & methods:** A total of 10 patients with presence of oral cancer, 10 patients with presence of oral potentially malignant disorders and 10 healthy controls were included. All the patients were recalled in the morning and blood samples were obtained. All the samples were sent to laboratory for assessment of serum uric acid levels. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Mean uric levels among the patients of the PMD group, OSCC group and the control group were 4.82 mg/dL, 3.99 mg/dL and 5.99 mg/dL respectively. Significant results were obtained while comparing the results statistically. **Conclusion:** Serum uric acid levels are significantly altered in patients with PMD and oral cancer.

**Key words:** Uric acid, Potentially malignant, Oral cancer

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#### INTRODUCTION

Many oral squamous cell carcinomas develop from potentially malignant disorders (PMDs). Correct diagnosis and timely treatment of PMDs may help prevent malignant transformation in oral lesions. Lack of awareness about signs and symptoms of oral PMDs among general population and even physicians are believed to be responsible for the diagnostic delay of these entities.<sup>1-3</sup>

Although little information is available regarding the real prevalence of PMDs in the general population, a commonly accepted prevalence of 1–5% has been reported.<sup>3</sup> Average age of patients with PMDs is 50–69 years, which is 5 years before occurrence of oral cancer.<sup>4</sup> Several lines of evidence, including clinical, experimental and morphological data, support the concept that squamous cell carcinoma of the upper aerodigestive tract arises from noninvasive lesions of the stratified squamous epithelium. These lesions encompass a histological continuum between the normal mucosa at one end and high-grade dysplasia/carcinoma *in situ*, at the other end, establishing a model of neoplastic progression. Uric acid

has been demonstrated to be an important antioxidant and a free radical scavenger in humans. It is one of the major radical-trapping antioxidants in plasma and is reported to protect the erythrocyte membrane against lipid peroxidation. Uric acid interacts with peroxynitrite to form a stable nitric oxide donor, thus promoting vasodilatation and reducing the potential for peroxynitrite-induced oxidative damage. Thus, uric acid could be expected to protect against oxidative stresses.<sup>5-7</sup> Hence, the study was undertaken to evaluate serum uric acid in oral cancer patients and patients with oral potentially malignant disorders.

#### MATERIALS & METHODS

The present study was conducted with the aim of assessed the serum uric acid in oral cancer patients and patients with oral potentially malignant disorders. A total of 10 patients with presence of oral cancer, 10 patients with presence of oral potentially malignant disorders and 10 healthy controls were included. All the patients were recalled in the morning and blood samples were obtained. All the samples were sent to laboratory for assessment of

serum uric acid levels. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

**RESULTS**

Mean age of the patients of the PMD group, OSCC group and the control group was 51.25 years, 55.12 years, and 52.10 years respectively. Mean uric levels among the patients of the PMD group, OSCC group and the control group were 4.82 mg/dL, 3.99 mg/dL and 5.99 mg/dL respectively. Significant results were obtained while comparing the results statistically.

Table 1: Mean age of patients of the three study groups

Age (years)	PMD	OSCC	Controls
Mean	51.25	55.12	52.10
SD	7.99	5.93	7.99

Table 2: Mean serum uric acid levels of the three study groups

Uric acid levels (mg/dL)	PMD	OSCC	Controls
Mean	4.82	3.99	5.99
SD	1.09	1.85	1.74

Table 3: Inter-group comparison of serum uric acid levels

Group comparison	p- value
PMD Vs OSCC	0.000 (Significant)
OSCC VS Controls	0.001 (Significant)
PMD Vs controls	0.001 (Significant)

**DISCUSSION**

Oral cancer includes a group of neoplasms affecting any region of the oral cavity, pharyngeal regions and salivary glands. However, this term tends to be used interchangeably with oral squamous cell carcinoma (OSCC), which represents the most frequent of all oral neoplasms. It is estimated that more of 90% of all oral neoplasms are OSCC. Worldwide, oral cancer accounts for 2%–4% of all cancer cases. In some regions, the prevalence of oral cancer is higher, reaching around 45% in India. In 2004-2009 over 300,000 new cases of oral and oropharyngeal cancer were diagnosed worldwide. During the same time period, over 7,000 affected individuals died of these cancers.<sup>5-7</sup> Hence, the study was undertaken to evaluate serum uric acid in oral cancer patients and patients with oral potentially malignant disorders.

In the present study, Mean age of the patients of the PMD group, OSCC group and the control group was 51.25 years, 55.12 years, and 52.10 years respectively. Mean uric levels among the patients of the PMD group, OSCC group and the control group were 4.82 mg/dL, 3.99 mg/dL and 5.99 mg/dL respectively. Significant results were obtained while comparing the results statistically.

Mazza et al. in a study in Italy, found that SUA could protect against cancer. The role of UA in conditions associated with oxidative stress is not entirely clear. The decrease SUA in oral cancer patients in this study is may attributed to nutritional compromise of the patients due to tumour necrosis factor and interleukin-6 produced in cancer and precancer patients, which cause loss of

appetite. SUA level can also affected by alcohol consumption, defects in purine metabolism, hyperinsulinemia, and genetic factors.<sup>7</sup> As free radical-induced damage is thought to be one of the important factors in the progression of PMD, treatment guidelines should include optimal strengthening of antioxidant defense. Serum UA is a potent free radical scavenger, and it has been demonstrated, using two methodologically distinct assays, that systemic administration of UA increases ex vivo serum free radical scavenging capacity to a significantly greater extent than vitamin C, another important aqueous physiologic antioxidant.<sup>8,9</sup>

In study conducted by Ars et al, the mean serum uric acid in the study group was very low when compared to the control group. Statistically it showed very high significance. This is comparable to the study done by Nagin et al where they found a significant difference in low serum uric acid associated with increased risk of oral cancer compared to healthy subjects.<sup>10-12</sup>

It appears that S UA as a biochemical indicator has got no direct and overall significant influence associated with tobacco habit. Variability of the values of this serum biochemical in precancerous condition and cancer patients may be due to multiple reasons, such as age, nutritional status, body mass index, alcohol consumption, exercise habits. The variability in levels of this parameter might also arise from methodological difference. Although, this study does not entirely resolve the controversy of the role of SUA in cancer etiopathogenesis, but the status of t SUA can be considered as one of the biochemical markers in oral PMDs and OC.<sup>10</sup>

**CONCLUSION**

Serum uric acid levels are significantly altered in patients with PMD and oral cancer.

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