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## Estimation Of Sera Levels Of Urea, Uric Acid and Creatinine in Oral Submucous Fibrosis (OSMF) Patients: A Randomized, Blind trial, A Preliminary Study

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### Research Article

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#### ABSTRACT

**Aim:** To analyze serum uric acid, urea, and creatinine levels in Oral Submucous Fibrosis patients and compare them with those of healthy controls.

**Materials and Methods:** 40 OSMF patients and 20 controls had serum uric acid, urea and creatinine levels measured using spectrophotometer. The data obtained was analyzed using the Statistical Package for the Social Sciences, version 19.0 (SPSS 19). Statistical significance was determined at  $p < 0.001$ .

**Results:** No significant variation was observed in serum uric acid and urea levels although the results were found to be significant in case of sera creatinine levels in OSMF patients when compared with normal controls.

**Conclusion:** This study showed that serum uric acid, urea and creatinine were altered in OSMF patients compared with healthy volunteers but were statistically insignificant, not for creatinine. However, further prospective cohort studies are suggested to better understand their role in the etio-pathogenesis of OSMF.

### INTRODUCTION

Oral Submucous Fibrosis (OSMF) is a chronic insidious disease with precancerous potential. Since the last decade, there has been constant rise in OSMF in India. This rise in OSMF in India has been attributed to the increased consumption of areca nut, containing detectable levels of trace elements like copper, zinc, iron and magnesium <sup>[1]</sup>. The role of areca nut in the pathogenesis of OSMF has been studied in detail over last two decades. It is apparent that fibrosis and hyalinization of sub-epithelial connective tissues account for most of the clinical features encountered in this condition. Moreover, substantial amount of research appears to have focused on changes in the extracellular matrix (ECM). It is logical to hypothesize that the increased collagen synthesis or reduced collagen degradation as possible mechanisms in the development of the disease <sup>[2]</sup>. The pathogenesis of the disease is still not clearly understood but it is usually considered to be an abnormal wound healing process and is often compared with fibrosis of other organs <sup>[3]</sup>. Fibrosis occurring in other organs like liver is associated with a number of biochemical changes, which lead to structural and metabolic abnormalities. Impaired lipid metabolism and consequent impaired or reduced cholesterol occurs in fibrosis and cirrhosis of liver <sup>[4]</sup>. On comparing OSMF with liver fibrosis, it can be hypothesized that biochemical parameters might also play a role in pathogenesis of the disease. Very little information is available about the biochemical abnormalities and changes in metabolic parameters. Hence, in the present study, several biochemical parameters associated with the pathogenesis of OSMF have been undertaken to assess their role in the etio-pathogenesis of this disease process.

## MATERIALS AND METHODOLOGY

A clinical study was conducted between 2014 to 2015 with 20 clinically diagnosed and histopathologically proven patients of OSMF (OSMF group) attending the Department of Oral Medicine and Radiology and 20 controls (control group). Patients with habit of chewing areca nut or one of its commercial preparations, with the presence of burning sensation, inability to consume spices, stiffness of buccal mucosa, vesicle formation, ulceration, and blanching of oral mucosa were included in the OSMF group. Patients with any systemic disease or any major illness, and habit of chewing only tobacco were excluded. The OSMF group was clinically staged into stage I and stage II as per the staging given by Pindborg<sup>[5]</sup>. Twenty healthy individuals, matched for gender and age, without any history of habit of chewing areca and tobacco and without any major illness in recent past were included as controls. The uric acid present in serum was determined by the method devised by Caraway<sup>[6]</sup>. Serum creatinine was estimated by the method of Owen et al.<sup>[7,8]</sup>.

## RESULTS

	Group I (Early OSMF)	Group II (Advanced OSMF)	Normal control
Urea	5.20 +/- 0.9 (NS)	5.45 +/- 1.8 (NS)	5.25 +/- 1.5
Uric Acid	6.25 +/- 2.0 (NS)	8.00 +/- 1.4 (NS)	7.99 +/- 3.0
Creatinine	450 +/- 33 *	509 +/- 38.2 *	345 +/- 27

Values are expressed as mean +/- SD for 20 patients in each group. Group I and Group II are compared against the control group.

NS: Not significant

\*Significance:  $p < 0.001$

## DISCUSSION

Oral Submucous Fibrosis (OSMF) is a chronic, insidious oral mucosal condition of the oral cavity characterized by submucosal fibrosis as characterized by juxta-epithelial inflammatory reaction followed by chronic change in the fibro-elasticity of the lamina propria and is associated with epithelial atrophy. This results in burning sensation in the oral cavity causing trismus thereby impairing the ability to speak. The more matter of concern over the past few decades is the malignant transformation rate, which has been reported to be around 7.6% over a 17-year period. Oral cancer developing from a precancerous lesion is quite a common phenomenon these days. The harmful habits such as use of tobacco intake both in smoking and smokeless forms, pan masala and Gutkha chewing, and products which contain areca nut are the main causative agent for premalignant disorders. In the literature from Indian subcontinent preview, use of areca nut is the most common etiologic agent<sup>[9]</sup>. Hence, we evaluated the sera levels of urea, uric acid and creatinine in oral submucous fibrosis patients and normal controls. This study showed that serum uric acid, urea and creatinine levels were altered in OSMF patients compared with healthy volunteers but were statistically insignificant in case of sera levels of urea and uric acid as against the sera levels of creatinine wherein the results were found to be statistically significant. This shows that changes in the biochemical values do occur in the premalignant state of the body however, their exact role in the etio-pathogenesis as well as their role as relevant diagnostic and/or, prognostic markers has yet to be established. In fibrosis cases, due to reduced nutrient flow, there is reduction in blood supply to the region just as in systemic sclerosis as demonstrated by Partovi et al. study<sup>[10]</sup>. Over a period of time, there can be complete fibrosis and loss of activity of the muscle leading to improper nutrition intake, malnutrition and therefore, decrease in the standard and quality of life. Lawa et al showed that serum uric acid levels were lowered in oral cancer patients in his study when compared with healthy volunteers and these low serum uric acid levels were associated with increased risk of oral cancer development<sup>[11]</sup>. The lowering of serum uric acid levels in oral cancer patients may be attributed to Tumour necrosis Factor (TNF) and Interleukin-6 (IL-6) produced in cancer patients which results in loss of appetite and malnutrition. Serum uric acid levels are also affected by alcohol consumption and various drugs such as diuretics and genetic factors<sup>[12]</sup>. This study however showed statistically significant variation in the sera levels of creatinine as against the study of Joseph et al who found no significant alteration in the creatine phosphokinase levels in oral submucous fibrosis patients<sup>[13]</sup>. Hence, biochemical alterations might be seen in premalignant disorders.

## CONCLUSION

The present study stresses on the assessment of the biochemical status of patients afflicted with Oral Submucous Fibrosis. Determining serum urea, uric acid and creatinine is a part of biochemical assessment, which may be of proactive intervention for high-risk groups. It is therefore, suggested that the biochemical analysis can be helpful in mass screening of the OSMF patients. Further research work is required in this field to find out the exact role which these parameters might have in the etio-pathogenesis of OSMF.

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