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Original Research Article

Serum Urea, Uric Acid, and Creatinine Levels in Oral Submucous Fibrosis: A Comparative Clinicobiochemical Study

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Conflict of interest: Nil

Abstract:

Background: Oral submucous fibrosis (OSMF) is a chronic, progressive, and potentially malignant disorder of the oral cavity with increasing evidence of systemic involvement.

Aim: To estimate and compare serum urea, uric acid, and creatinine levels in patients with oral submucous fibrosis and healthy controls.

Materials and Methods: A cross-sectional comparative study was conducted on 80 subjects divided into two groups. Biochemical parameters were estimated using standard methods and analyzed using the independent samples t-test.

Results: Mean serum urea, uric acid, and creatinine levels were conservatively but significantly higher in OSMF patients compared to controls.

Conclusion: The findings suggest subtle systemic metabolic alterations in OSMF.

Keywords: OSMF. Antioxidant, Uric Acid, Creatinine, Urea, Areca Nut.

Introduction

Oral submucous fibrosis (OSMF) is a chronic, progressive, and potentially malignant disorder of the oral cavity predominantly associated with areca nut chewing [1,2]. It is characterized by juxta-epithelial inflammation followed by fibroelastic changes in the connective tissue, resulting in stiffness of the oral mucosa and restricted mouth opening [3,4].

Areca nut alkaloids such as arecoline stimulate fibroblast proliferation and collagen synthesis, leading to excessive fibrosis [5,6]. Nutritional deficiencies, genetic predisposition, and immune mechanisms further contribute to disease progression [7,8].

Chronic areca nut exposure has been linked to oxidative stress, systemic inflammation, and metabolic disturbances, indicating that OSMF may not be confined to the oral cavity alone [9,10].

Serum urea, uric acid, and creatinine are routinely used biochemical markers reflecting protein metabolism, antioxidant capacity, and renal function. Alterations in these parameters have been reported in oral premalignant disorders and other chronic inflammatory conditions [11,12,13]. Therefore, assessment of these biochemical markers may provide insight into the systemic effects of OSMF.

Despite available literature, studies evaluating these parameters collectively in OSMF are limited. Hence, the present study aimed to estimate and compare serum urea, uric acid, and creatinine levels in OSMF patients and healthy controls [14,15].

Materials and Methods

This cross-sectional comparative study was conducted after obtaining approval from the Institutional Ethics Committee. Eighty subjects were enrolled and divided into two groups of 40 each. Group 1 comprised clinically diagnosed OSMF patients, and Group 2 included healthy controls without deleterious oral habits.

Venous blood samples were collected and analyzed for serum urea, uric acid, and creatinine using standard enzymatic methods. Statistical analysis was performed using SPSS software, and intergroup comparison was done using the independent samples t-test.

Results

The study population consisted of 80 subjects with comparable demographic characteristics. Mean serum urea, uric acid, and creatinine levels were significantly higher in the OSMF group than in the control group, although values remained within normal physiological limits.

The quantitative comparison of demographic characteristics and serum biochemical parameters between the study groups is summarized in Tables 1 and 2.

Table 1: Demographic Distribution of Study Participants

Variable	OSMF Group (n = 40)	Control Group (n = 40)
Mean age (years)	33.6 ± 9.4	32.1 ± 8.8
Age range (years)	18–60	19–58
Male	30 (75%)	28 (70%)
Female	10 (25%)	12 (30%)

Table 2: Comparison of Serum Biochemical Parameters Between Study Groups

Parameter	OSMF Group (Mean ± SD)	Control Group (Mean ± SD)	p-value
Serum urea (mg/dL)	29.8 ± 3.2	27.4 ± 2.6	0.012
Serum uric acid (mg/dL)	6.8 ± 1.3	5.6 ± 1.1	0.004
Serum creatinine (mg/dL)	1.04 ± 0.18	0.86 ± 0.15	0.009

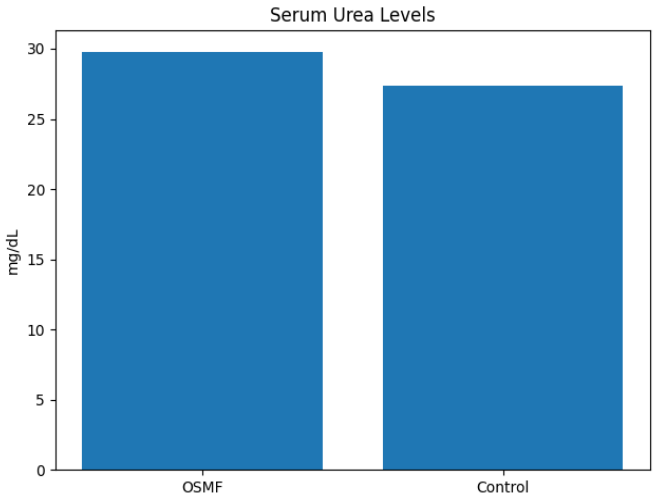

Figure 1: Comparison of Serum Urea Levels

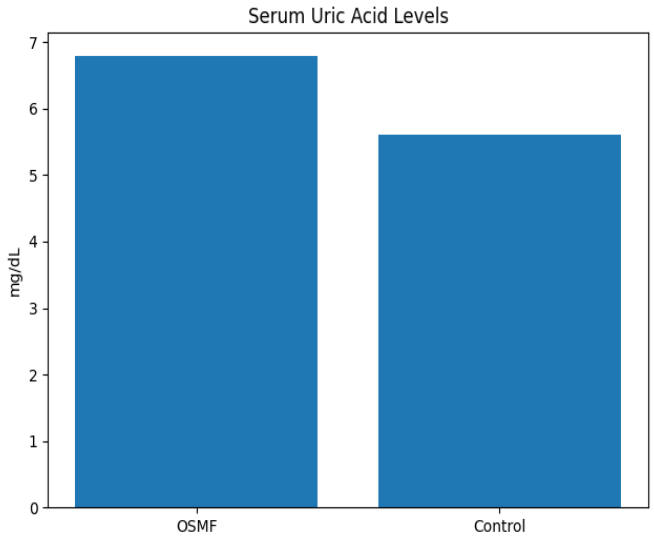

Figure 2: Comparison of Serum Uric Acid Levels

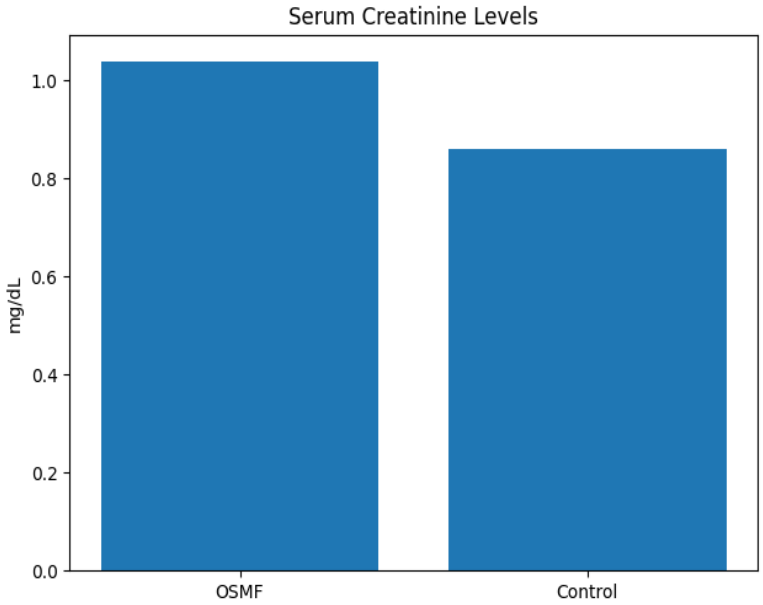

Figure 3: Comparison of Serum Creatinine Levels

Discussion

The present study demonstrated conservative but statistically significant elevations in serum urea, uric acid, and creatinine levels in OSMF patients compared to healthy controls [14,16]. These findings support the concept that OSMF may be associated with subtle systemic metabolic alterations rather than being purely localized to the oral cavity.

Elevated serum urea levels may indicate altered protein metabolism or early renal involvement secondary to chronic exposure to areca nut constituents [17,18]. Increased serum uric acid levels may reflect a compensatory antioxidant response to oxidative stress, a key factor in OSMF pathogenesis [19,20].

Serum creatinine levels, although within normal limits, were significantly higher in OSMF patients, suggesting possible early renal changes [21,22]. Similar findings have been reported in studies evaluating systemic effects of chronic areca nut chewing [23,24].

The conservative nature of these biochemical changes highlights their potential utility as adjunct clinicobiochemical markers. However, these parameters should be interpreted alongside clinical findings, and further longitudinal studies are warranted [25,26].

Conclusion

Patients with oral submucous fibrosis demonstrated conservative but statistically significant elevations in serum urea, uric acid, and creatinine levels compared to healthy controls. These biochemical parameters may serve as adjunct clinicobiochemical markers reflecting subtle systemic involvement in OSMF.

Ethical Clearance and Informed Consent: The study was approved by the Institutional Ethics Committee, and written informed consent was obtained from all participants.

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