

## Periodontal Findings in patients with Oral Submucous Fibrosis

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### Abstract:

**Background:** This study was conducted to assess the Periodontal Findings in patients with Oral Submucous Fibrosis. **Material and methods:** The study group (group A) was made up of 100 subjects with OSMF out of which 60 were males and 40 were females. The control group (group B) was made up of 100 patients of the same age of which 70 were males and 30 were females and who did not have OSMF and were going for restorative treatment of dental cavities or impacted teeth. For each patient, a custom-made case proforma was used that asked for information about their personal, medical, and dental history. **Results:** The mean MGI, PI, as well as BI in group A were 1.21, 1.98, as well as 1.33, accordingly, which was higher compared to group B, which were 0.74, 1.12, and 0.94, accordingly. This variation among the two groups was numerically significant. 20 subjects in group A (20%) and 75 subjects in group B (75%) had chronic gingivitis. 80 subjects (80%) in group A and 25 patients (25%) in group B had chronic periodontitis. Group A showed higher mean PD, AL, and GR, at 1.75, 1.09, and 0.64 mm, respectively, compared to group B, at 1.53, 0.58, and 0.11 mm, correspondingly. Comet cells were also observed. **Conclusion:** OSF caused considerable changes in the gingiva, and the presence of comet cells in all OSF patients is a strong signal of potential pathognomonic developments.

**Keywords:** periodontal, oral submucous fibrosis, plaque index, probing depth.

### Introduction:

Oral submucous fibrosis (OSMF) precancerous condition and is chronic, resistant disease characterized by juxta-epithelial inflammatory reaction and progressive fibrosis of the submucosal tissues. In 1966, Pindborg<sup>1</sup> defined OSMF as “an insidious chronic disease affecting any part of the oral cavity and sometimes pharynx. It is associated with juxta-epithelial inflammatory reaction followed by fibroelastic changes in the lamina propria layer, along with epithelial atrophy which leads to rigidity of the oral mucosa proceeding to trismus and difficulty in mouth opening.” Other terms used to describe this condition are juxta-epithelial fibrosis, idiopathic scleroderma of the mouth, idiopathic palatal fibrosis, submucous fibrosis of the palate and pillars, sclerosing stomatitis, and diffuse OSMF.<sup>2</sup>

It occurs at any age but most commonly seen in young and adults between 25 and 35 years (2nd–4th decade). Onset of this disease is insidious and is often 2–5 years of duration. It is commonly prevalent in Southeast Asia and Indian subcontinent.<sup>3</sup> The prevalence rate of OSMF in India is about 0.2%–0.5%. This increased prevalence is due to increased use and popularity of commercially prepared areca nut and tobacco product - gutkha, pan masala, flavoured supari, etc.<sup>4</sup> The malignant transformation rate of OSMF was found to be 7.6%.

On initial examination of the oral cavity, the mucosa appears to be normal in colour. In patients suffering from OSF, the oral mucosa loses its normal resiliency and suppleness and becomes stiff with the progression of the disease. The involvement of various regions of the oral cavity

and its characteristic clinical appearance depends on the type of chewing habit.

Hence, this study was conducted to assess the Periodontal Findings in patients with Oral Submucous Fibrosis.

## Material and methods:

The study group (group A) was made up of 100 subjects with OSMF out of which 60 were males and 40 were females. The control group (group B) was made up of 100 patients of the same age of which 70 were males and 30 were females and who did not have OSMF and were going for restorative treatment of dental cavities or impacted teeth. For each patient, a custom-made case proforma was used that asked for information about their personal, medical, and dental history. The patients

were asked about everything, and their comments were written down on the proforma. Every patient was told about the study and gave writing permission before they could take part. People who smoked, had aggressive periodontitis, any other diseases in their bodies, were pregnant or breastfeeding, had taken antibiotics or non-steroidal anti-inflammatory drugs before the study, or had any other oral lesions like ulcers or precancerous or cancerous lesions were not allowed to take part in the study.

Periodontal findings like Plaque index (PI), modified gingival index (MGI), modified sulcular bleeding index (BI), probing depth (PD) (distance from gingival margin to the base of the sulcus), attachment loss (AL), and gingival recession (GR) were recorded.

## Results:

**Table 1: Number wise distribution of subjects in the study group and control group.**

Groups	Number of subjects
Group A (Study group)	100
Males:	60
Females:	40
Group B (Control group)	100
Males:	70
Females:	30

The study group (group A) was made up of 100 subjects with OSMF out of which 60 were males and 40 were females. The control group (group B) was made up of 100 patients of the same age of which 70 were males and 30 were females and who did not have OSMF and were going for restorative treatment of dental cavities or impacted teeth. The average age of people in groups A and B was 24 and 26, respectively.

The mean MGI, PI, as well as BI in group A were 1.21, 1.98, as well as 1.33, accordingly, which was higher compared to group B, which were 0.74, 1.12, and 0.94, accordingly. This variation among the two groups was numerically significant.<sup>20</sup>

subjects in group A (20%) and 75 subjects in group B (75%) had chronic gingivitis. 80 subjects (80%) in group A and 25 patients (25%) in group B had chronic periodontitis. Group A showed higher mean PD, AL, and GR, at 1.75, 1.09, and 0.64 mm, respectively, compared to group B, at 1.53, 0.58, and 0.11 mm, correspondingly. Comet cells were also observed.

## Discussion:

OSF is mainly induced by areca nut chewing in Asia. The main components of areca nut contain 31.1% phenols, 18.7% polysaccharides, 14% fat, 10.8% fiber, and 0.5% alkaloids.<sup>5</sup> Arecoline is the main alkaloid that causes the pathogenesis of the

OSF. Arecoline stimulates the fibroblast cells to express growth factors and cytokines that enhance the collagen deposition and repress the collagen degradation. Clinical studies reported transforming growth factor beta (TGF- $\beta$ ), connective tissue growth factor (CTGF), beta fibroblast growth factor (bFGF)<sup>6</sup>, alpha-smooth muscle actin ( $\alpha$ -SMA), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), serum c-reactive protein, ROS level, matrix metalloproteinases (MMP), and the tissue inhibitors of metalloproteinases (TIMP) were expressed abnormally in OSF group.

Arecoline activates the oral tissue express TNF- $\alpha$  that stimulates cell inflammation. Cell inflammation will activate the wound healing reaction, which decreases MMP and increases TIMP expression. This TIMP and MMP expression profile is also found in the oral tissue of OSF patients.<sup>7</sup>

In this research, the study group (group A) was made up of 100 subjects with OSMF out of which 60 were males and 40 were females. The control group (group B) was made up of 100 patients of the same age of which 70 were males and 30 were females and who did not have OSMF and were going for restorative treatment of dental cavities or impacted teeth. The average age of people in groups A and B was 24 and 26, respectively. The mean MGI, PI, as well as BI in group A were 1.21, 1.98, as well as 1.33, accordingly, which was higher compared to group B, which were 0.74, 1.12, and 0.94, accordingly. This variation among the two groups was numerically significant. 20 subjects in group A (20%) and 75 subjects in group B (75%) had chronic gingivitis. 80 subjects (80%) in group A and 25 patients (25%) in group B had chronic periodontitis. Group A showed higher mean PD, AL, and GR, at 1.75, 1.09, and 0.64 mm, respectively, compared to group B, at 1.53, 0.58, and 0.11 mm, correspondingly. Comet cells were also observed.

Xu C et al<sup>8</sup> investigated the periodontal status in patients with oral submucous fibrosis (OSF), and to provide reference for the treatment and prophylaxis in patients with OSF and betel chewers. Fifty samples clinically and pathologically diagnosed as OSF patients were selected as the OSF group, another 50 age-matched healthy volunteers in the similar living condition were compared with the OSF patients and non-betel nut chewers were

classified as the control group. The 5 periodontal clinical parameters were collected and recorded, including plaque index, periodontal probing depth, clinical attachment loss, gingival index, and tooth count of bleeding of probing. There was a significant difference in plaque index (PLI) between the OSF group (2.14 $\pm$ 0.64) and the control group (1.7 $\pm$ 0.89) ( $P < 0.01$ ). Periodontal probing depth (PD) was (1.98 $\pm$ 0.70) mm in the control group, and (5.57 $\pm$ 2.39) mm in the OSF group, with significant difference in PD ( $P < 0.01$ ). There was no significant difference in clinical attachment loss, gingival index, and tooth count of bleeding on probing between the 2 groups ( $P > 0.05$ ). It was concluded that the OSF patients tend to accumulate plaque, and have deep periodontal pocket, periodontal inflammation or severe periodontal damage.

In a study conducted by Dodani K et al<sup>9</sup>, one hundred cases of individuals with OSF and 89 without OSF were examined for periodontal parameters and compared. Biopsies of gingival tissue from both categories were examined with conventional hematoxylin and eosin staining for epithelial, connective tissue, and inflammatory changes. Comet assay of epithelial cells obtained from scraping the gingival surface of both patients with OSF and control individuals was performed. Patients with OSF had poorer oral hygiene and greater loss of attachment, probing depth, and recession compared with controls. Significant histopathologic changes in the form of loss of rete ridges with gingival epithelium reduced to a flattened surface was observed. All the patients with OSF showed comet cells in larger numbers. The controls also showed comet cells but in fewer numbers, and the number of individuals showing comet cells was significantly less. OSF showed significant changes in affected gingiva, and the presence of comet cells in all the patients with OSF is a significant indicator of possible pathognomonic developments.

## Conclusion:

OSF caused considerable changes in the gingiva, and the presence of comet cells in all OSF patients is a strong signal of potential pathognomonic developments.

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