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ORIGINAL ARTICLE

Prevalence of Different Stages of Oral Submucous Fibrosis in Patients Visiting Private Dental Institute in Karachi: A Cross Sectional Study

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ABSTRACT

Objective: The objective of this research is to evaluate the prevalence of OSMF stages in different age groups and by gender distribution and to assess the association of habit duration with the clinical stages of Oral Submucous Fibrosis in a private dental institution.
Materials & Methods: In the outpatient department of Oral Medicine, Ziauddin University, Karachi, a cross-sectional study was conducted over 12-months. Following the approval of the Ethics Committee, 61 individuals with diagnosed cases of OSMF were chosen for the study, including data categorized by gender, age and duration of habits. Diagnosis of OSMF was done according to clinical staging proposed by More et.al. Descriptive analysis was done according to frequency and percentages. Cross-tabulations were carried out between gender and stages of OSMF and between the duration of habits and different stages of OSMF.
Results: The research revealed a notable male predominance (60.7%) among the individuals, with the age group of 18 - 31 years. The most prevalent stage of OSMF among both genders was Stage III followed by Stage II, I and IV. Based on the duration of habits, group 3 (more than 10 years) showed more prevalence than the others.
Conclusion: OSMF has a high risk of malignant transformation, it poses a serious threat to public health. This study advocates for increased understanding of and strategies related to the management of OSMF, considering the severity and prevalence of the condition, particularly in males within the group under study. It also emphasizes the urgent need for public education on the harmful effects of areca nut.
Key words: Prevalence, Oral submucous fibrosis, Clinical staging

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INTRODUCTION

Oral submucous fibrosis (OSMF) is a chronic, progressive disease that mostly affects the mouth and, in certain circumstances, the throat. It is identified by the gradual development of fibrosis in the tissues underlying the mucosa and an inflammatory reaction close to the epithelial layer. This causes severe rigidity, which in turn limits the ability to expand the mouth[1]. This condition is associated with serious disease and an increased risk of developing cancer, making it a major public health concern in areas where it is common[2].

A common habit among South Asian and Southeast Asian communities, constant eating of areca nut has been linked to the cause of OSMF.The active alkaloid, arecoline found in areca nuts, has been associated with the onset of OSMF because of its inflammatory, cytotoxic, and fibrogenic properties[3]. Moreover, the disease is more complicated due to certain factors including immunological effects, dietary deficiencies, and hereditary vulnerability[4]. Epidemiological research on OSMF has revealed a varying prevalence worldwide, with South Asian countries like India having the highest rates, which may be attributed to dietary and cultural patterns[5]. Recent research indicates that OSMF is a potentially malignant condition, with a global prevalence estimated to be between 2.28% and 8.62%[6]. There is a male predominance for the condition, which has been associated with higher rates of areca nut consumption among men than women[7]. Nevertheless, the prevalence is not insignificant in females, indicating the impact of genetic predisposition and passive exposure[8]. The malignant transformation rate of OSMF has ranged from 7% to 30%, which raises serious concerns[9]. This variability highlights how crucial it is to identify affected people early, manage them appropriately, and keep monitoring them constantly.The mechanisms leading to the malignant transformation of OSMF are not fully understood, regardless of known risk factors and the demonstrated malignant potential, necessitating further research[10].

OSMF classification and staging are critical for assessing the severity of the condition, constructing treatment strategies and projecting results. There have been various proposed methods for clinical staging, the most used ones center on the degree of mouth opening and histological features.These staging methods make it easier to compare study results and to conduct standardized OSMF assessments[11].

In light of the substantial impact that OSMF has on public health, particularly in endemic areas, comprehensive initiatives that address prevention, early detection, and management are needed urgently.A comprehensive strategy to combat this disorder must include public health activities that reduce the intake of areca nuts, improve nutritional status, and raise awareness of the risks associated with OSMF[12]. Different characteristics of OSMF have been recognized by dental researchers. However, more work needs to be done in the field of evidence-based dentistry, particularly with respect to the relationship between the clinical staging of OSMF and the gender role and duration of habits. These factors have been associated with the various clinical stages of OSMF in the current cross-sectional study.

MATERIALS AND METHODS

This study used a cross-sectional methodology to investigate the prevalence and distribution of oral submucous fibrosis stages among patients who came to the outpatient department of Oral Medicine, Ziauddin University, Karachi. Using a purposive sample technique, the study included 61 diagnosed OSMF patients. Patients with OSMF of any age or gender were included in the study while participants who had other potentially malignant oral diseases were eliminated.

Patients were classified according to gender (male or female), age, and duration of habits once the OSMF diagnosis was confirmed by clinical examination.The following criteria were used to define the age groups: 18 - 31 years, 32 - 45 years and 46 - 60 years. Duration of habits was divided into 3 groups which were as follows: Group A: 2-5 years, Group B: 6-10 years and Group C: more than 10 years.This classification made it possible to thoroughly analyze the distribution and prevalence of OSMF stages across different demographic groups. As suggested by Chandramani More et al.,[13] of the selected patients were divided into 4 groups according to their clinical stage. This staging system divides OSMF into several groups according to clinical characteristics, such as the degree of mouth opening, the existence of fibrotic bands and other associated features. A standardized framework for evaluating OSMF severity in the study group was made available by the criteria for each stage. Software for statistics was used to process the data collected from the study. Descriptive statistical techniques were used to describe the demographic characteristics of the study population and the distribution of OSMF stages.The

percentage of the study participants impacted by each stage of OSMF was calculated. Chi-square analysis was performed to investigate the association between the stages of OSMF and demographic variables such as age, gender, and duration of habit. A p-value of less than 0.05 was used to indicate statistical significance.

RESULTS

These are the findings from our 12-month cross-sectional investigation on the occurrence of OSMF at a private dental institution. 61 patients in total were clinically diagnosed with OSMF, after which they were grouped according to age and gender to determine the condition's prevalence and stage.

Distribution of gender:

Significant male predominance was evident in the gender distribution of patients with OSMF (Figure 1). A significant majority of the 61 patients diagnosed with OSMF, 37 were men, making up 60.7% of the total cases. By comparison, out of all the cases, only 24 patients were found to be female, accounting for 39.3%. Targeted interventions are necessary, as this gender disparity is significant.

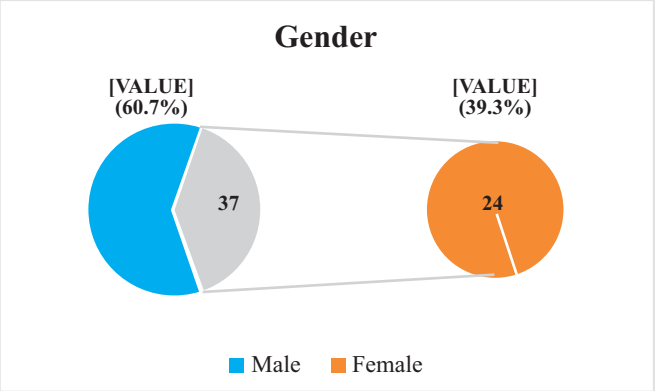

Figure 1: Distribution of OSMF by gender

Age distribution:

The condition was most common in the 18-31 age range, according to the age-wise distribution of OSMF (Figure 2). The number of patients affected by OSMF in the age group of 18-31 years was the highest, with 18 patients aged 46-60 years, and 15 patients aged 32-45 years, suggesting a concentration of cases in young adults. According to this distribution, young age may be a crucial time for the onset and diagnosis of OSMF.

OSMF stage in females:

With 11 cases reported, stage 3 OSMF was found to be the most common among female patients (Figure 3). Subsequently, stage 2 accounted for nine cases, while

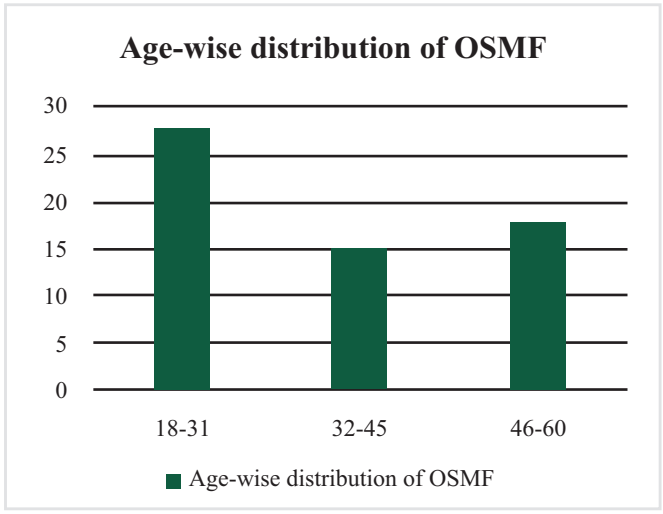

Figure 2: Age-specific OSMF distribution

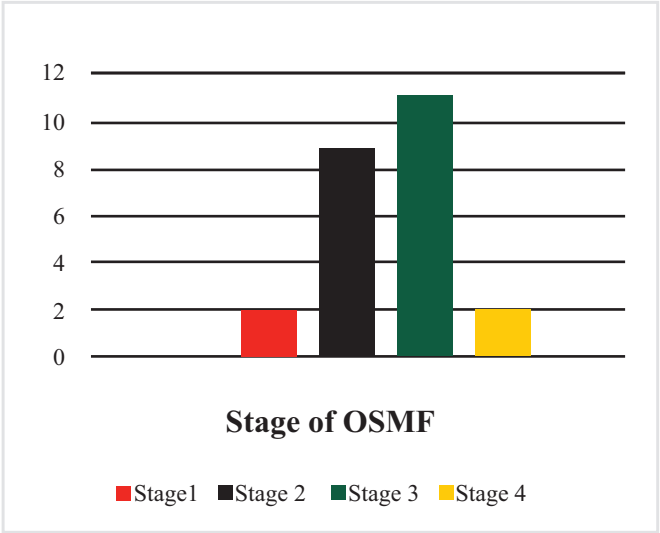

Figure 3: OSMF stage in females

stages 1 and 4 each had two cases. The increased frequency of stage 3 suggests that women in this group were primarily diagnosed with a disease of moderate severity.

OSMF stage in males:

Stage 3 OSMF had the highest prevalence (18 cases) in male patients, comparable to female patients, indicating that men were also diagnosed with the condition at a severe stage more often (Figure 4). After this, stage 2 had 13 cases followed by Stage 1 with 5 cases and Stage 4 with 1 case. The data shows that a considerable proportion of male patients have advanced OSMF, underscoring the

necessityfor early detection methods in this population. The prevalence of OSMF according to habit duration has been shown in Table 1. Group C had a higher prevalence (52.5%) than Group B (34.4%) and Group A (13.1%). There was no statistically significant prevalence (p= 0.31) *p-value <0.05 is considered significant, Chi-square test was applied

The findings show a distinct pattern related to gender and

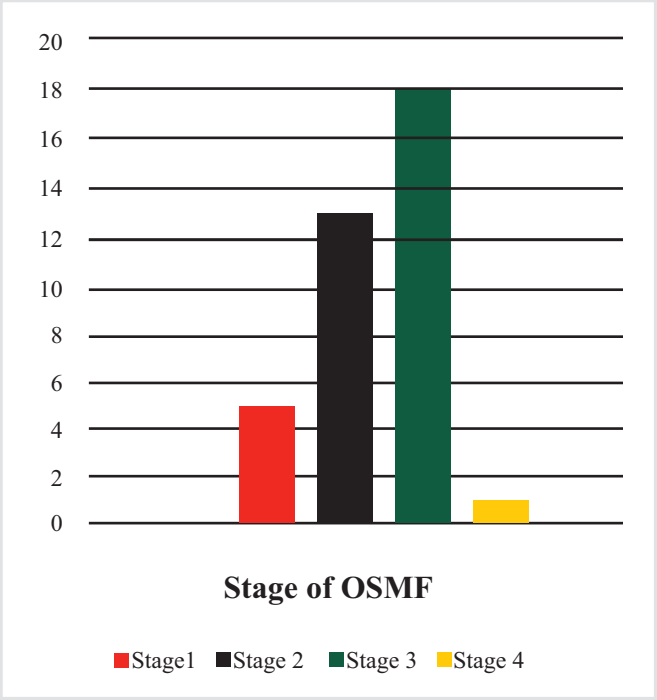

Figure 4: Staging of OSMF in males

Table 1: Prevalence of OSMF based on stages of OSMF

Duration of habits	Stages of OSMF				Total
	Stage 1	Stage 2	Stage 3	Stage 4	
2-5 years (Group A)	0	1	6	1	8
6-10 years (Group B)	2	8	11	0	21
More than 10 years (Group C)	5	13	12	2	32
Total	7	22	29	3	61

age in the staging and prevalence of OSMF, with a greater frequency in men, especially in the 18-31 age range. Stage 3 OSMF was found to be the most common stage at diagnosis in both genders, giving rise to possibilities for early management and possible insights into the natural evolution of the disease.

DISCUSSION

The findings of our research identify notable gender and age-related patterns in the event of OSMF, with a notable predominance in males and a higher frequency in the 18 -31 years age range. This inequality in gender is consistent with other studies as well with 60.7% of OSMF cases being male showing a high correlation between OSMF and gender-specific habits like tobacco and areca nut consumption that are more common in men[14,15]. According to the literature, men are more likely than women to have oral disorders associated with areca nut usage[16]. According to our cohort's age distribution of OSMF patients, the clinical presentation could be directly correlated with the duration of exposure to risk factors, especially in the 18-31 years age group[17]. This might be a result of more social interactions and financial freedom they experience at this age. As a result, at this age, they engage in a variety of chewing habits, including pan masala, gutkha, betel nut, smoking, and drinking, either as a fashion statement, a coping mechanism for stress, or a result of peer pressure. This is corroborated by the results of other investigations which have demonstrated a latency period between the beginning of exposure to risk factors and the clinical manifestation of OSMF[18]. Moreover, the prevalence of stage 3 OSMF in our sample suggests that patients typically look for care in the later stages of the disease, maybe because of the development of more obvious symptoms like restricted mouth opening and burning sensation[19].

The staging pattern raises concerns regarding the development of OSMF and the possibility of interventions during this stage, with stage 3 being the most prevalent among both genders. Severe fibrosis and major functional impairment are frequently present at this stage[20]. A key phase where intervention might prevent the progression into more severe stages, which are associated with an increased risk of malignant transformation, may be reflected in the high prevalence of stage 3 OSMF[21].

Many patients had advanced stages of OSMF, which emphasizes the need for public health programs that emphasize early detection and preventive education[22]. These results are consistent with research highlighting the value of awareness campaigns and cessation programs in

the high-risk population[23]. In addition, a multidisciplinary approach to managing OSMF is necessary to address the complex etiology of the disease. This approach should involve not just dentists but also oncologists, dietitians, and psychologists[24].

A study conducted in India assessed the impact of areca nut product type, frequency, and duration on the occurrence and severity of OSMF. The results indicated that the type of areca nut product used, and its frequency and duration of use had an impact on the incidence and severity of OSMF. The effects of pan masala and gutkha on the oral mucosa are more rapid and detrimental. In terms of the frequency, severity, and incidence of OSMF, the gutkha-chewing practice had no discernible impact when combined with the other habits[25].The duration of areca nut product use was found to have a non-significant effect on both the incidence and severity of OSMF in the current study. Additionally, the findings of our research demonstrate the need for more investigation into the pathophysiology of OSMF, specifically regarding the processes involved in the development of disease and malignant transformation. While data from the literature indicate that the transformation rate of OSMF into cancer varies from 7% to 30%, identifying the precise stages at which these transformations occur could significantly affect treatment strategies and patient outcomes[26,27].

To establish suitable preventive and control strategies, epidemiological data gathered across a broad geographic area will help determine overall incidence and prevalence rates. Intervention should be at the community level and should target high-risk individuals and populations who use tobacco products. Primary healthcare providers and dentists should take an active part in the prevention and control of tobacco-induced lesions, as they are typically the first to interact with patients who are at elevated risk. The shortcomings of this study include small sample size and the possibility of preconceived notions because patient self-reporting was employed to gather data, which could have led to underreporting of habits. The findings of this study shed light on the patterns of behavior among the individuals in the organization where the investigation was carried out. This is concerning because over half of the participants were younger and suffering from OSMF. In the future, more studies should be done with a larger sample size from multiple centers and in the general population. Genetics and the susceptibility of the patient to the onset and course of OSMF should receive more attention than habit-centered history and management. Additionally, it is necessary to stress and educate patients in the early phases of OSMF on the significance of long-term follow-up after habit cessation.

CONCLUSION

The demographic trends found in this research add to the expanding body of data supporting the screening and intervention techniques. The development and progression of OSMF are influenced by cultural and behavioral factors, which should be considered in age- and gender-specific strategies. Future studies should carry out more investigation into the natural history of OSMF, the efficacy of different therapeutic approaches and the significance of molecular and genetic markers in the development of the disease. Due to the high incidence of OSMF, there must be a major public education campaign and careful management of the disease. Dentists and other primary healthcare providers must be educated about etiopathogenesis, clinical presentation, diagnosis, and treatment of this condition.

Author's contribution

KI: Contributed to the conception and design of the study, methodology, data collection, drafting the manuscript, and critical revision.

FA: Contributed to the critical revision of the manuscript and provided final approval of the version to be published.

SF: Performed statistical analysis and approved the final manuscript.

AA: Contributed to data collection, formal analysis, and literature search.

YA: Contributed to methodology, statistical analysis, and data collection.

AN: Reviewed and edited the manuscript. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work.

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Ethical approval

This study was approved by the Institutional Review Board of the Ziauddin University, Karachi with the No (1840120KIOM, dated: March 6' 2020).

Informed Consent

The written consent was obtained from all participants in this study.

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Availability of data and materials
The data supporting this study's findings are available from the corresponding author upon reasonable request.

Consent for publication
Not applicable.

Disclaimer of using AI tools
Not utilized. All ideas, arguments, and conclusions presented in the letter, however, are entirely the authors' original work. The authors take full responsibility for the accuracy and integrity of the content.

Conflict of interest
No conflict of interest.

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