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Research Article

Prevalence Of Different Stages Of Oral Submucous Fibrosis In India: A Cross Sectional Study

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ABSTRACT

Background: Oral Submucous Fibrosis (OSMF) is a persistent and gradually developing disorder that impacts the mouth and occasionally the throat. It is marked by an inflammatory response just beneath the epithelium and alterations in the fibroelastic components of the lamina propria. These changes result in stiffness of the oral mucosa, limited mouth opening (trismus), and challenges with eating. OSMF is distinguished by its significantly elevated potential to progress into malignancy, compared to other oral lesions with a risk of malignancy, predominantly affecting those of Indian and Southeast Asian descent. The global prevalence rate stands at 2.28% - 8.62%, with a notable gender disparity in occurrence and a malignant transformation rate of 4.2%.

Aim: The objective of this research is to evaluate the prevalence and distribution by gender of OSMF stages within a private dental institution, with a particular emphasis on examining the relationship between the frequency of the disease and the occurrence of its stages.

Materials and Methods: Over a period of 32 months, a cross-sectional analysis was carried out in the outpatient section of the Department of Oral Medicine and Radiology. After receiving approval from the ethics committee, 337 individuals diagnosed with OSMF were selected for inclusion in the study, with information categorized according to gender and age.

Results: The study found a significant male predominance (94%) among the patients, with a mean age of 31-50 years. Stage 2 OSMF was more prevalent among both genders, followed by stage 3 and 1, indicating a specific pattern of disease progression.

Discussion: Consistent with previous studies, our research confirmed a male predominance in OSMF occurrence. The age and stage distribution aligns partially with existing literature, suggesting a predominant affliction of individuals in their mid-life. Contrary to Anuna Liala Mathew et al.'s findings, our study observed a higher prevalence of stage 2 OSMF, underscoring potential variations in disease progression or detection practices.

Conclusion: OSMF presents a significant public health challenge due to its high malignant transformation potential and association with arecanut and tobacco use. This study highlights the urgent need for public education on the adverse effects of these substances and calls for enhanced awareness and management strategies for OSMF, particularly considering its prevalence and severity among males in the studied population.

Introduction

Oral Submucous Fibrosis (OSMF) is a long-term, evolving condition that primarily impacts the mouth and, in some cases, the throat. It is distinguished by an inflammatory response near the epithelial layer and the gradual development of fibrosis in the tissues beneath the mucosa. This results in significant stiffness and ultimately restricts the ability to open the mouth [1]. This disorder is linked with considerable illness and a heightened likelihood of turning cancerous, positioning it as a significant public health issue in regions where it is widely prevalent [2].
The cause of OSMF has been associated with the regular consumption of areca nut, a habit prevalent among South Asian and Southeast Asian communities [3]. The active alkaloid in areca nut, arecoline, has been implicated in the development of OSMF due to its fibrogenic, cytotoxic, and inflammatory properties [4]. Furthermore, factors such as genetic susceptibility, nutritional shortfalls, and immunological influences add to the complexity of the disease [5].
Epidemiologically, OSMF has shown a variable prevalence globally, with the highest rates observed in India and other parts of South Asia, reflecting dietary habits and cultural practices [6]. Recent studies estimate the global prevalence of OSMF to be between 2.28% and 8.62%, highlighting its significance as a potentially malignant disorder [7]. The condition exhibits a male predilection, which has been attributed to higher rates of areca nut consumption among men [8]. However, the incidence in females is not negligible, suggesting the influence of passive exposure and genetic susceptibility [9].

The malignant transformation rate of OSMF is a critical concern, with estimates ranging from 4% to 13% [10]. This variability underscores the importance of early detection, appropriate management, and continuous monitoring of affected individuals [11]. Despite the known risk factors and the established malignant potential, the mechanisms underlying malignant transformation in OSMF are not fully understood, warranting further research [12].

Classifying and staging OSMF is crucial for evaluating the severity of the disease, formulating treatment plans, and predicting outcomes. Several clinical staging systems have been suggested, with the most widely adopted ones focusing on the extent of mouth opening and histopathological characteristics [13]. These staging systems facilitate the standardized assessment of OSMF and enable the comparison of study outcomes [14].

Given the significant burden of OSMF on public health, especially in endemic regions, there is an urgent need for comprehensive strategies encompassing prevention, early detection, and management [15]. Public health initiatives focusing on reducing areca nut consumption, improving nutritional status, and enhancing awareness of OSMF's risks are crucial components of a holistic approach to combating this condition.

Methodology

This research utilized a cross-sectional approach to examine the prevalence and distribution of stages of Oral Submucous Fibrosis (OSMF) in patients visiting the Outpatient Department of Oral Medicine and Radiology at a private dental institute. Conducted over 32 months, this study aimed to thoroughly document the occurrence of OSMF among the patient cohort during the specified period.

Study Population and Sampling

The research focused on individuals diagnosed with OSMF who sought care at the Outpatient Department of Oral Medicine and Radiology throughout the duration of the study. The study encompassed 337 patients, selected through a purposive sampling method to guarantee the inclusion of those diagnosed with OSMF. The inclusion criteria encompassed patients of all ages and genders diagnosed with OSMF, while individuals with other oral potentially malignant disorders or conditions were excluded from the study.

Data Collection and Division

Upon confirmation of OSMF diagnosis through clinical examination and biopsy where necessary, patients were categorized based on gender (male or female) and age. The age groups were defined as follows: below 20 years, 21-30 years, 31-40 years, 41-50 years, and above 50 years. This categorization enabled an in-depth examination of the prevalence and distribution of OSMF stages among various demographic groups.

Staging of OSMF
The staging of OSMF among the patients was conducted according to the criteria established by Mathur and Jha. This staging system classifies OSMF into various stages based on clinical features, including the extent of mouth opening, the presence of fibrotic bands, and other related symptoms. The detailed criteria for each stage provided a standardized framework for assessing the severity of OSMF among the study population.

Statistical Analysis
Statistical software was utilized to process the data gathered from the research. The study population's demographic details and the spread of OSMF stages were outlined using descriptive statistical methods. The proportion of the study population affected by various stages of OSMF was determined in percentage terms. To explore the relationship between demographic factors like age and gender with the stages of OSMF, Chi-square tests were applied. A p-value below 0.05 was deemed to indicate statistical significance.

Quality Control and Assurance
To ensure the reliability and validity of the study findings, several quality control measures were implemented. These included the calibration of examiners to standardize the diagnosis and staging of OSMF, regular monitoring of data collection processes, and the use of validated tools and criteria for OSMF staging. Additionally, ethical considerations were strictly adhered to throughout the study to uphold the integrity of the research.

This methodology provides a comprehensive framework for investigating the prevalence and stages of OSMF in a specific patient population, contributing valuable insights into the epidemiology of this condition within the context of a private dental institute.

Results

The results of our cross-sectional study on the prevalence of Oral Submucous Fibrosis (OSMF) at a private dental institute over a period of 32 months are presented below. A total of 337 patients were clinically diagnosed with OSMF and subsequently categorized by gender and age to determine the distribution and staging of the condition.

Gender Distribution
The gender-wise distribution of OSMF among the patients showed a marked male predominance. Out of the 337 individuals diagnosed with OSMF, a substantial majority of 316 patients were males, accounting for 94% of the cases. In contrast, only 21 female patients were identified, representing 6% of the cases. This significant gender disparity underscores the need for targeted interventions [Figure 1].

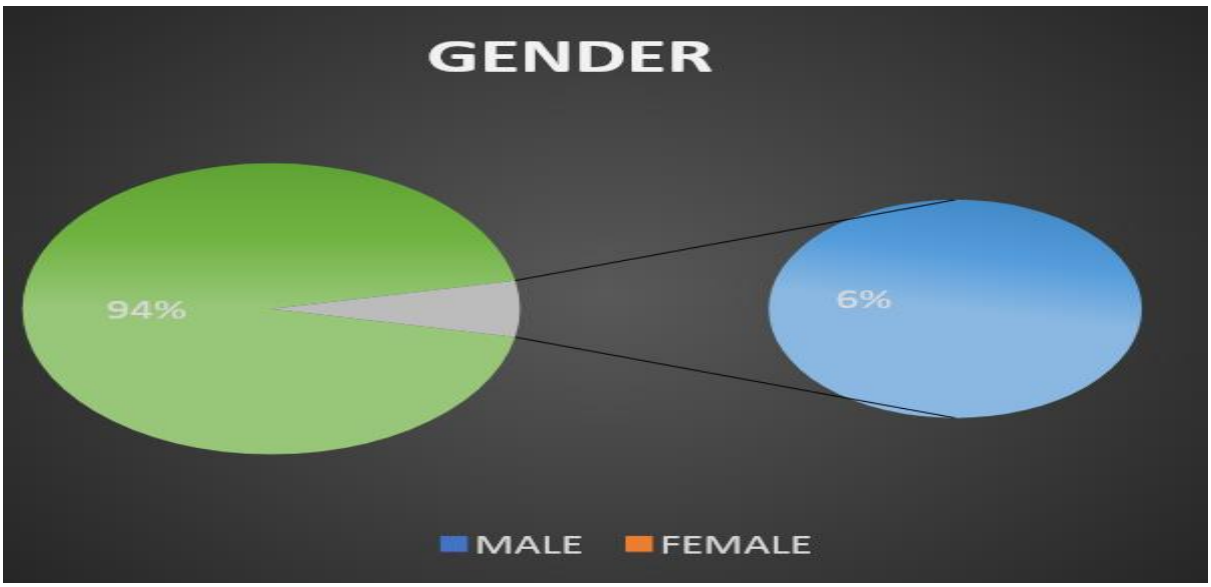

FIGURE 1: Gender-wise distribution of OSMF

Age Distribution
The age-wise distribution of OSMF revealed that the condition was most prevalent in the 31-50 years age group. The number of patients affected by OSMF in this age bracket was the highest, with 67 individuals aged 31-37 years and 62 individuals aged 38-44 years, indicating a concentration of cases in middle-aged adults. The least affected age group was those above 80 years, with only one patient diagnosed with OSMF. This distribution suggests that middle age could be a critical period for the development and diagnosis of OSMF [Figure 2].

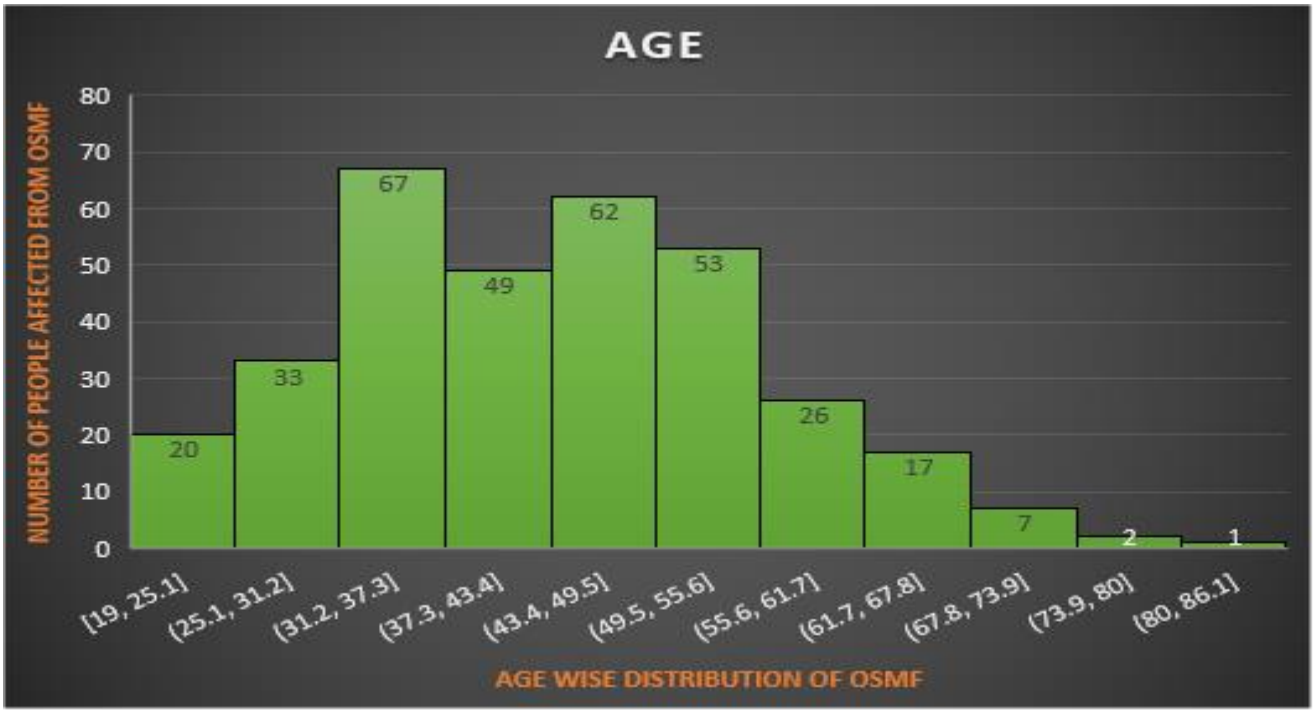

FIGURE 2: Age-wise distribution of OSMF

Staging of OSMF in Females

Among the female patients, Stage 2 OSMF was observed to be the most prevalent, with 12 cases recorded. This was followed by Stage 1 with 5 cases, and Stage 3 with 4 cases. The higher prevalence of Stage 2 indicates that women in this cohort were most commonly diagnosed with an intermediate severity of the condition [Figure 3].

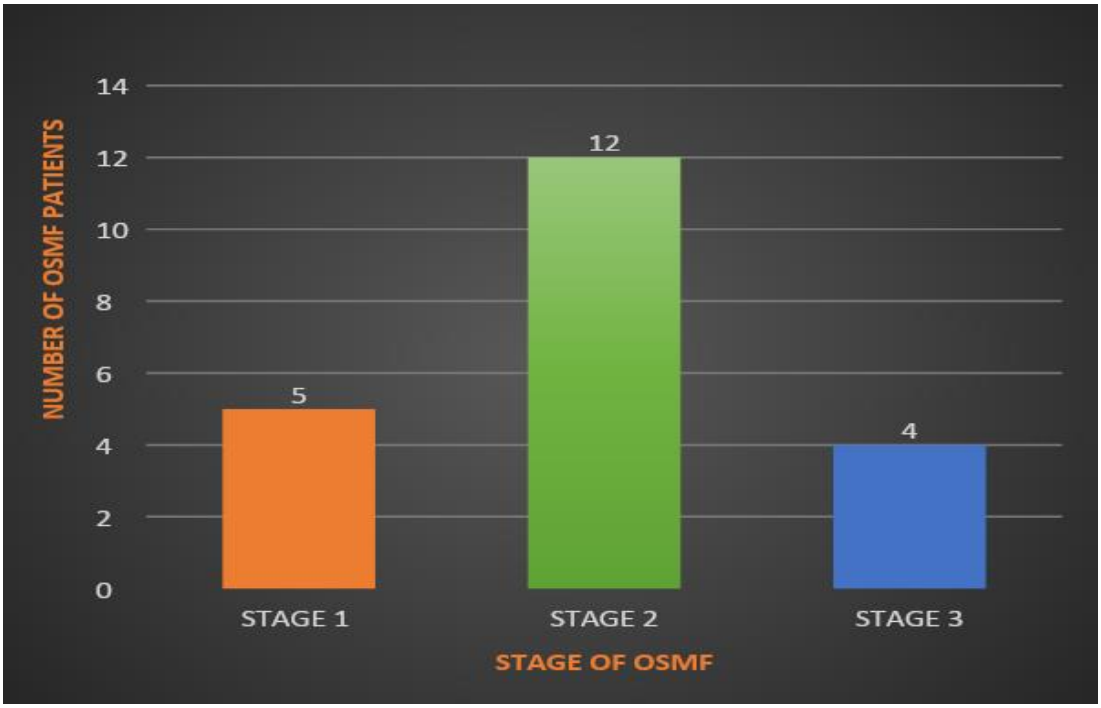

FIGURE 3: Staging of OSMF in Females

Staging of OSMF in Males

In male patients, similar to females, Stage 2 OSMF had the highest prevalence with 176 cases, suggesting that men were also most frequently diagnosed at an intermediate stage of the disease. This was followed by Stage 3 with 104 cases, and Stage 1 with 57 cases. The data indicates that a significant number of male patients present with advanced stages of OSMF, highlighting the need for early detection strategies in this demographic [Figure 4].

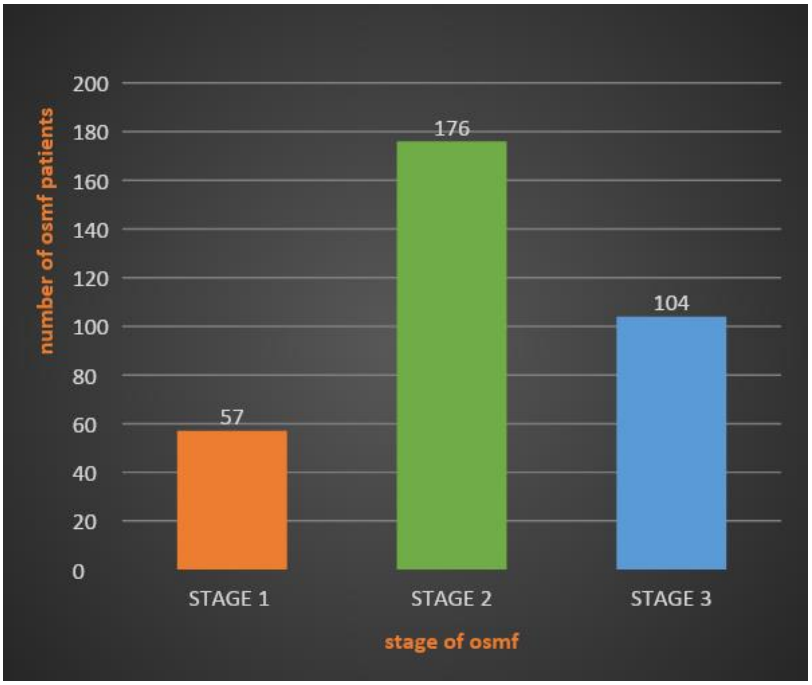

FIGURE:4 Staging of OSMF in Males

The results demonstrate a clear gender and age-related pattern in the prevalence and staging of OSMF, with a higher incidence among males, particularly in the 31-50 years age group. Stage 2 OSMF was identified as the predominant stage at diagnosis across both genders, offering potential understanding into the disease's natural evolution and opportunities for early intervention.

Discussion

Our study's results highlight notable patterns related to gender and age in the occurrence of Oral Submucous Fibrosis (OSMF), demonstrating a significant predominance among males and a greater frequency within the 31-50 years age bracket. The gender disparity observed, with 94% of OSMF cases being male [16], aligns with previous research indicating a strong association between OSMF and gender-specific habits, such as tobacco and areca nut use, which are more prevalent among males [17]. This is consistent with the literature that reports a higher predilection for substance abuse-related oral conditions in men [18].

The age distribution of OSMF cases in our cohort, particularly the concentration in the 31-50 years age bracket, suggests that the disease's clinical manifestation may be closely related to the duration of exposure to risk factors [19]. This is supported by findings from other studies that have identified a latency period between the onset of risk factor exposure and the clinical presentation of OSMF [20]. Furthermore, the predominance of Stage 2 OSMF in our study indicates that patients tend to seek medical attention during the moderate stage of the disease [21], possibly due to the onset of more noticeable symptoms such as limited mouth opening and burning sensation [22].

The staging pattern, with Stage 2 being the most common among both genders, raises concerns about the progression of OSMF and the potential for interventions during this stage. This stage is often characterized by moderate fibrosis and the beginning of significant functional impairment [23]. The high prevalence of Stage 2 OSMF might reflect a critical period where intervention could prevent progression to more advanced stages, which are associated with a higher risk of malignant transformation [24].

The advanced stages of OSMF observed in a significant number of male patients highlight the necessity for public health initiatives focused on early detection and preventive education [25]. These findings corroborate with studies emphasizing the importance of awareness campaigns and cessation programs targeting high-risk populations [26]. Moreover, the management of OSMF should be multidisciplinary, involving not only dental professionals but also oncologists, nutritionists, and psychologists, to address the multifactorial etiology of the disease [27].

Our study's results also underscore the need for continued research into the pathophysiology of OSMF, particularly concerning the mechanisms of disease progression and malignant transformation (28). Although literature reports suggest that the rates of malignant transformation in OSMF range from 4% to 13% [29],

pinpointing the specific stages at which these transformations take place could have a profound impact on clinical approaches and patient outcomes [30].

In conclusion, the demographic patterns observed in this study contribute to the growing body of evidence that supports targeted screening and intervention strategies. These strategies should be gender-sensitive and age-specific, taking into consideration the cultural and behavioral factors that contribute to the development and progression of OSMF [31]. Future research should continue to explore the natural history of OSMF, the effectiveness of various intervention strategies, and the role of genetic and molecular markers in disease progression [32].

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