

Oral Submucous Fibrosis: A Clinico-Histopathological Study

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ABSTRACT

Background: Oral submucous fibrosis (OSMF) is a chronic condition characterized by progressive stiffening of the oral mucosa with the resultant inability to open the mouth. It is a premalignant condition of the oral cavity with the major aetiological factor being the consumption of areca nut. It is one of the major cause of OSMF.

Materials and methods: A total of seventy-five cases were selected. This included cases reported during 2017 and 2019, both prospective and retrospective cases. For retrospective study all clinical details and histopathology slides were retrieved from files of the oral and maxillofacial pathology department.

Results: In our study of seventy-five patients, males contributed 87% of the cases and the remaining was contributed by females. Panmasala habit was more predominant.

Conclusion: The occurrence of OSF was much higher in younger group. The prevalence of OSF was more in males than in females. There was absolutely no correlation between clinical staging to histopathological grading. The panmasala was most consumed goods related to tobacco.

Keywords: OSMF, tobacco chewing, cancer.

INTRODUCTION

Oral sub mucous fibrosis (OSF) is a disease, which mainly occurs in South East Asians and Indians.¹ OSF is a deceptive, chronic ailment involving any part of the oral cavity and occasionally the pharynx and oesophagus.² This disease is characterized by a mucosal inflexibility of erratic intensity due to the fibroelastic changes of the juxtaepithelial layer, consequential in a progressive inability to open the mouth.³ It has been recommended that ingesting of chilies, chewing of areca nut, nutritional deficiency, genetic susceptibility, altered salivary constituents, autoimmunity and collagen disorders may be involved in the pathogenesis of this condition.⁴ OSF is a well-recognized, potentially premalignant condition.⁵ Malignant transformation rates as high

as 7.6% have been reported from the Indian subcontinent over a 17-year period.⁶

Dental researchers have reported various aspects of OSMF in past decades.⁷ It was either as simple case reports, population-based studies or hospital-based case control studies. Moreover, animal many animal studies have been carried to analyses the etiopathogenesis of OSF.⁸ Light microscopy histopathologic examination has been also carried out to assess the changes in OSMF. The current study was commenced to correlate the ability to open the mouth to the histopathological features seen under a light microscope.

Received: Jan. 12, 2021; Accepted: Feb. 22, 2021

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MATERIALS AND METHHODS

The patients were selected from the patients in the department of Oral and Maxillofacial pathology from our institution during the period 2017-2019. A total of seventy-five cases were selected. This included cases reported during 2017 and 2019, both prospective and retrospective cases. For retrospective study all clinical details and histopathology slides were retrieved from files of the oral and maxillofacial pathology department. For the other cases, case history was taken and clinical examination was done in visible light using a mouth mirror and a probe.

Clinical criteria for the diagnosis of OSF were difficulty in opening the mouth and associated blanched oral mucosa with palpable fibrous bands. Cases complaining of difficulty in opening the mouth due to other reasons like inflammation etc were excluded from the study. The distance between the interincisal edges was measured in mm for assessing the ability to open the mouth. Incision biopsy was done with the patient's consent. OSF cases were clinically categorized into three clinical stages according to their ability to open the mouth as given below:

Stage I - Mouth opening $\geq$ 45 mm

Stage II - Restricted mouth opening 20-44 mm

Stage III - Mouth opening $\leq$ 20 mm

The biopsy tissue was processed for paraffin embedding. Sections of 5 micrometer thickness were used for haematoxylin and eosin (H and E) staining. The sections were studied under a binocular light microscope.

The following histological details were recorded and graded:

Epithelium: Type of keratinization-para / orthokeratosis

Thickness-atrophic / hyperplastic

Dysplasia-mild / moderate / severe

Connective tissue: Type of fibrous tissue-loose / dense

Hyalinization-partial / complete

Inflammatory cells: Acute / Chronic; focal / diffuse; juxtaepithelial / perivascular

The histopathological grading is given below:

Patients' chewing habits are categorized as follows:

Betel nut: Use of betel / areca nut like kalipakku, kottai pakku or seeval; Betel quid: Use of betel leaf, lime and betel nut along with tobacco; Paanmasala: Various commercial brands in which the main ingredient is areca nut, to which sweetening and flavoring agents are added.

Statistical analysis

Data analysis and database management were done using SPSS (Statistical Package for Social Science) version 10.05. Person's Chi-square test was done to determine the association between variables.

RESULTS

Age and gender distribution of the study subjects, correlation of habits with gender of subjects, frequency and duration of the habits, correlation of clinical staging with age, gender and habits and correlation of histopathological grading with habits and clinical staging, are tabulated in [Table - 1], [Table - 2], [Table - 3], [Table - 4], sections from various cases, representing histopathological characteristics.

Table 1: Gender and age distribution.

Age	Male	Female	Total	P value
20-24	16	1	17	0.031
25-29	17	1	18	
30-34	15	nil	15	
35-39	5	5	10	
>40	12	3	15	
Total	65	10	75	

Table 2: Mean age.

	Male	Female
Mean age	32.34 $\pm$ 10.61	36.24 $\pm$ 9.52

Table 3: Habit vs Gender.

Habit	Male (Percentage)	Female (Percentage)	Total (Percentage)	P value
Beetal Nut	8(12.3)	3 (50.1)	11 (14.6)	0.000
Beetal quid	7 (10.8)	6 (40.1)	13 (17.9)	
Pan Masala	49 (75.4)	1 (15.1)	51 (68.4)	
Total	65 (100)	10 (100)	75 (100)	

Table 4: Mean frequency of the different habits.

Habit	frequency	P value
Beetal Nut	7.09 ± 2.64	0.25
Betal Quid	6.01 ± 3.02	
Pan Masala	8.92 ± 4.82	

DISCUSSION

OSMF is a deadly disease of the oral mucosa.⁹ This encourages the dental professionals all over the world. This disease is very common in different parts of India. It is also very common in many parts of the world. This disease usually confined to the reason where the use of tobacco is more. This has led to the idea that dietary or cultural habits prevalent in this region act as the etiological factors.^{7,10,11} Several epidemiological studies and case reports have suggested the aetiopathogenesis, clinical and histopathological features.¹² The present study is undertaken to correlate the chewing habits and the ability to open one's mouth to various histopathological changes in 75 cases of OSF.

In our study of seventy-five patients, males contributed 87% of the cases and the remaining was contributed by females. A literature search showed a vast variation in the sex and age distribution of OSF. Some surveys in India have shown a female dominance whereas others showed male predominance. A male predominance in OSF cases was shown by Sinor *et al.*¹³ in India. We also observed a male predominance and the male to female ratio was 6:1. Half of the study population was in the age group of 20-29 years. This observation is different from that of Pindborg *et al.*¹⁴ who reported the maximum number of OSF cases in the age group of 40-49 years in their study. Increase in the chewing habit of the areca nut without any tobacco and the use of various commercial products containing areca nut may explain the decrease in the age of OSF cases due to various chewing habits.¹⁵ The mean age of occurrence was lower in males than in females and the difference was statistically significant ($P < 0.009$).

It has been assumed by Caniff *et al.* that areca nut stuffs exacerbate the submucosal fibrosis initiated by chronic inflammation.⁸ The inflammatory cells

seen predominantly were lymphocytes and plasma cells.¹⁰ The presence of a large number of lymphocytes and the production of cytokines play significant roles in the tissue reaction in OSF.¹⁶ In our study, 64% of the cases had diffuse chronic inflammation of which 54% had histological grade I, 39% histopathological grade II and 7% had histopathological grade III. Although chronic inflammatory cell infiltrate is a common feature in all three histopathological grades, it shows a reduced presence in histopathological grade III as a result of the stabilization of the lesion and reduction in levels of proinflammatory mediators.

CONCLUSION

The occurrence of OSF was much higher in younger group. The prevalence of OSF was more in males than in females. There was absolutely no correlation between clinical staging to histopathological grading. The panmasala was most consumed goods related to tobacco.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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