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PREVALANCE OF ORAL SUBMUCOUS FIBROSIS: A CLINICOPATHOLOGIC STUDY IN A POPULATION OF JHARKHAND

Oral Pathology

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ABSTRACT

Objectives: Oral submucous fibrosis (OSMF) is a common chronic debilitating oral health problem in India. The present study was conducted to correlate clinical staging with histopathological grading in patients of OSMF.

Material and methods: The present study comprised of 50 patients of OSMF, which were evaluated for the age, sex, site, habit and clinical stage and were correlated with histological grading.

Results: OSMF was reported as more in younger age group with a male predominance. Smokeless tobacco particularly arecanut and gutka showed a strong association in early development of OSMF.

Conclusion: Though the present study showed no significant correlation between clinicalstaging and histopathological grading with p=0.635. This difference may be attributed toseverity and amount of fibrosis in various parts of the oral mucosa.

KEYWORDS

Oral submucous fibrosis, areca nut, precancerous condition.

Introduction:

The term 'atrophica idiopathica mucosa oris' was coined by Schwartz in 1952 to define OSMF disease which he discovered in 5 women of Indian origin from Kenya.[1] Joshi afterward renamed the disease as oral submucous fibrosis in the year 1953.[2]

Oral submucous fibrosis is a premalignant condition and a chronic debilitating disease of the oral cavity, which is characterized by insidious fibro-elastic changes, burning sensation, blanching, and stiffening of the oral mucosa and oro-pharynx leading to trismus, i.e restricted or inability to open the mouth. The severity of OSMF depends on the progression of the lesions and number of sites affected. OSMF is predominant among the people of South Asia.[3-4] One peculiar feature of this disease is there is neither regression nor any efficient treatment. There are few noteworthy studies corelating frequency of OSMF with its clinicopathological features. Henceforth the aim of this study is to compare the clinical staging of mouth opening in OSMF patients with histopathological grading.

Materials and Methods

A total of 50 subjects clinically diagnosed as OSMF were selected for the study. A comprehensive case history and clinical examination was done in each case in the Department of Oral Medicine.

Inclusion criteria

Patients range between 20 years and 50 years of age with habit of consuming areca nut in diverse forms like betul nut, betel leaf with lime and betel nut and panmasala (areca nut containing sweetening and flavouring agents. Patient complaining of reduced mouth opening, blanching of oral mucosa, ulceration, burning sensation and palpable fibrous bands were kept as the clinical criteria for the diagnosing of OSMF. Subjects who met all these criteria were included in the study. **(Fig 1,2)**

Exclusion criteria

Subjects having diagnosed with systemic conditions like anemia, edentulous patients and OSMF associated with any other lesion. Patients complaining of difficulty in mouth opening due to various other reasons like inflammation/infection, trauma or because of some temporo-mandibular joint disorders and lastly the subjects giving history of more than one chewing habit were excluded from the study.

The inter-incisal distance between the maxillary and mandibular central incisor edges was measured in milimeters for assessing the mouth opening and then all the cases were clinically categorized as stage I, II and III based on Kiran Kumar et al.[5] After taking patient's consent an incisional biopsy was performed in all the cases of OSMF.

Clinical staging of OSMF followed in the study was referred by Kiran Kumar et al[5]

Stage I	Mouth opening	45 mm
Stage II	Restricted mouth opening	20-44 mm
Stage III	Mouth opening	< 20 mm

The histopathological grading of OSMF followed in the study was referred by Kiran Kumar et al5 (Fig 3)

Grade I	Loose, thin or thick collagen fibres
Grade II	Thick fibres with limited hyalinization
Grade III	Absolute hyalinization

The collected data was tabulated and analysed. The mean and standard deviation of the three groups were tested statistically using the anova technique. The mean age difference between the two genders and association between two variables was calculated using student t-test. *P* value was considered significant at <0.05.

RESULTS

The study comprised of a total of 50 cases of OSMF. In the present study the age of the patients ranged between 20-50 years and the peak incidence was reported between 20 to 30 years of age. **(Table 1)** The incidence of OSMF reported was more in young than the older age group. The mean age of incidence was reported as lower in males than in females with a p value<0.027(significant).

On comparing gender with clinical staging and histopathological grading. Out of the 50 cases of OSMF, 42 (84%) cases were of males and 8 (16%) cases were seen in females making the male to female ratio as 5:1. **(Table 2)**

Frequency of consumption of betel nut was reported as 9.77 ± 2.68 per day, betel quid as 4.80 ± 2.06 per day and pan masala as 14.05 ± 3.68 per day. Duration in years of chewed betel nut was reported as 09.35 ± 3.85 years, betel quid as 10.68 ± 4.05 years and for pan masala as 10.15 ± 3.44 years. **(Table 3)**

On evaluating clinical staging of mouth opening with histopathological grading of fibrosis in OSMF cases no significant correlation was observed with p=0.635 (not significant). **(Table 4)**

DISCUSSION

Oral submucous fibrosis is a chronic potential premalignant condition of the oral cavity. It is predominantly reported in Indians and people of south East Asian Origin.[6] Reichart et al suggested that as an outcome of transmigration of people, a growing number of OSMF cases are being reported in other countries too.[7] The disease affects various parts of the oral cavity and oropharynx.[6] The etiopathogenesis of OSMF is considered as multifactorial and thus has been a topic of wide research

since the last 50years. The habit of chewing betel quid (containing areca nut, tobacco and slaked lime) has been acknowledged as one of the most significant risk factors for OSMF. Once the disease advances to early stage from very early stage and still the patient continues with the habit of chewing areca nut the process accelerates the severity of fibrotic changes within the connective tissue. As the disease progresses ahead the thickness of the collagen fibers increases rapidly and the collagen becomes more dense and tightly packed, ultimately causing reduction in mouth opening.[8]

The age of the patient in the present study was ranging between 20-50 years with a peak incidence falling between 20 to 30 years of age. Around half of the population studied was lying in the age group of 20-30 years. The mean age of 29.3 years was reported in our study which is consistent with the studies by by Katharia and Maher who reported it as 29.04 years and 30 years respectively. [9-10] This observation varies from that of Pindborg et al. who reported the highest number of OSMF cases in the age group of 40-49 years.[11] In the present scenario the changing trend of the disease is showing more inclination towards males of the younger age group possibly because of increased social exposure, economic independence and excessive freedom at an early age, consequently, they get addicted to various harmful chewing habits such as betel nut, betel quid and pan masala etc. In the present study, the mean age of occurrence was lower in males than in females and the difference was statistically significant (P<0.027).

Among 50 cases of OSMF studied 42 (84%) were males and 8 (16%) cases were females. Previous studies have reported a wide variation in age and gender distribution of OSMF. In the present study we observed a male predominance in OSMF cases with a male to female ratio as 5:1 which was consistent with other studies by Sinor et al. [12] who has also reported male predominance and Dave who has reported male to female ratio as 2.3:1.[9]

In the current study, patients had one or other chewing habit like panmasala, betel nut alone or in combination with lime and betel leaf(betel quid), among which areca nut was one of the chief constituents. Out of 50 patients, 40% patients chewed panmasala, 30% chewed betel nut and the remaining 30% chewed betel quid. It was observed that the duration of habit in those who chewed betel quid was eleven years while it was reported as ten years for betel nut and nine years in case of panmasala chewers. On correlating duration of habit with clinical staging the result were not statistically significant. This was similar with the result reported by Shah *et al.* who acknowledged the same that the total duration of the chewing habit is not significantly correlated to incidence of OSMF.[13] It was also observed that patients having panmasala with a greater frequency/day developed OSMF within a shorter span of the habit. This implies that the exposure to various harmful substances with a higher frequency in a given period is more significant than the total span of the habit and the difference was statistically significant ($P < 0.001$). A consistent finding was also reported by Maher *et al*. who stated that frequency of daily consumption is more significant with respect to the risk rather than the longer duration of the habit.[10] An additional fact was reported about onset of OSMF, mucosal changes occurs earlier with panmasala chewing than with areca nut/quid chewing. Betel leaf has got anti-oxidant properties and therefore a high proportion of areca nut is required for early development of OSMF and this highlights the importance of betel/areca nut in the etiology of OSMF.

Though OSMF can involve any part of the oral mucosa, but still buccal mucosa remains the most frequently involved site followed by of soft palate uvula, lips, tongue and floor of the mouth.[9] The average mouth opening i.e. inter-incisal distance in males and females are reported as 47.5 mm and 44.6 mm respectively. Following that the OSMF patients are grouped into three clinical stages according to Ranganathan et al criteria.[5] Out of 50 cases, 6 were found to be in stage I, 34 in stage II and 10 in stage III. Clinically maximum numbers of cases were found in stage II. The reason behind this could be attributed to the wide range of mouth opening kept in clinical stage II i.e about 20-44 mm. Tupkari has also reported similar findings in his study with maximum cases lying in stage II and III.[14]

On correlating clinical staging of trismus with histopathological grading, out of 50 patients, 6 cases were in clinical stage I while 2 were in histopathological grade I. Then 34 cases were in clinical stage II while 18 were in histopathological grade II. Again 10 patients were in clinical stage III, out of which 4 cases were in histopathological grading III. The highest numbers of OSMF cases were seen in clinical stage II and histopathological grade II. The number of cases reported as clinical stage I (12%) and clinical stage III (20%) showed a marked discrepancy in their histopathological grading. The explanation can be attributed to the fact that the biopsies were taken from the anterior buccal region, as it was an accessible site to perform punch biopsy. Ranganathan et al. has concluded that the fibrosis initially occurs in the faucial pillars, followed by buccal and labial areas. Thus altering the elasticity of the oral mucosal tissue and increasing the severity of the disease, measured as restricted ability to open the mouth. Patients with histopathological grade II have more collagenous bands in the posterior region; while fewer bands are seen in the anterior region. This might be the reason behind shifting of the patients in clinical stage II to histopathological grade I and some patients from clinical stage III to histopathological grades I and II. These findings were also consistent with the observations by Rooban et al. who also observed that there is no association between clinical staging of mouth opening and histological grading of fibrosis, possibly because of the difference in severity and extent of fibrosis at various sites of the oral mucosa.[1]

CONCLUSION

The relative association between clinical staging and histopathological grading acts as an adjunct for the diagnosis, prognosis and severity of this multifactorial crippling disease. The present study opens the gate for further researches in the etiopathogenesis of OSMF based on genetic, environmental, immunologic and nutritional interactions. The study also highlights the requirement of motivational oral health programs for youngsters and teenagers to refrain them from various chewing habits especially betel nut chewing, which is a most prevalant habit among this age group.

TABLE 1: Comparison of age with clinical staging and his to pathological grading

AGE	CLINICAL STAGING			HISTOPATHOLOGICAL GRADING		
	Stage I	Stage II	Stage III	Grade I	Grade II	Grade III
20-25	2 (11.8%)	1 (76.5%)	2 (11.8%)	2 (11.8%)	9 (52.9%)	6 (35.3%)
26-30	0 (0.0%)	9 (90.0%)	1 (10.0%)	0 (0.0%)	7 (70.0%)	3 (30.0%)
31-35	1 (25.3%)	2 (50.0%)	1 (25.0%)	0 (0.0%)	2 (50.0%)	2 (50.0%)
36-40	1 (14.3%)	3 (42.9%)	3 (42.3%)	1 (14.3%)	3 (42.9%)	3 (42.9%)
41-45	1 (14.3%)	3 (42.9%)	3 (42.3%)	1 (14.3%)	4 (57.2%)	2 (28.6%)
46-50	1 (20.0%)	4 (48.0%)	0 (0.0%)	2 (40.0%)	2 (40.0%)	1 (20.0%)
TOTAL	6 (12.0%)	34 (68.0%)	10 (12.0%)	6 (12.0%)	27 (54.0%)	17 (12.0%)

p value < 0.027

TABLE 2: Comparison of gender with clinical staging and histopathological grading

GENDER	CLINICAL STAGING						HISTOPATHOLOGICAL GRADING					
	Stage I		Stage II		Stage III		Grade I		Grade II		Grade III	
	n	%	n	%	n	%	n	%	n	%	N	%
Male	6	14.3	30	71.4	6	14.3	6	14.3	22	52.4	14	33.3
Female	0	0.0	4	50.0	4	50.0	0	0.0	5	62.5	3	37.5
TOTAL	6	12.0 %	34	68.0 %	10	20.0 %	6	12.0 %	27	54.0 %	17	34.0 %

Table 3: Mean frequency and duration of various habits Habits Mean±SD

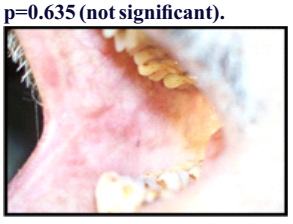
Habits	Daily Frequency	Duration(in years)
Betel Nut	9.77 ± 2.68	09.35 ± 3.85
Betel Quid	4.80 ± 2.06	10.68 ± 4.05
Pan Masala	14.05 ± 3.68	10.15 ± 3.44

SD=Standard division

TABLE 4: Comparison of clinical staging with histopathological grading

	Grade I		Grade II		Grade III		TOTAL	
	n	%	n	%	n	%	n	%
Stage I	2	33.3	4	66.7	0	0.0	6	12.0
Stage I	3	8.8	8	52.9	13	38.0	34	68.0
Stage I	1	10.0	15	50.0	14	40.0	10	20.0
TOTAL	6	12.0	27	54	17	34	50	100

p=0.635 (not significant).



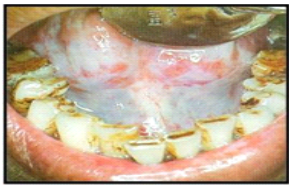
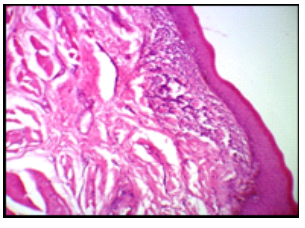
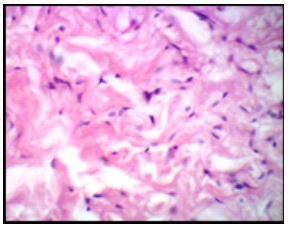
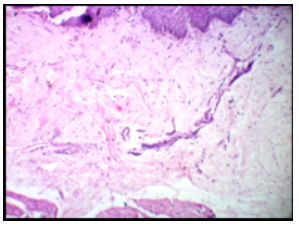


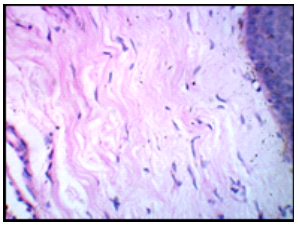
Figure 1: Fibrous bands on buccal mucosa. Figure 2: Dense fibrosis involving the floor of the mouth



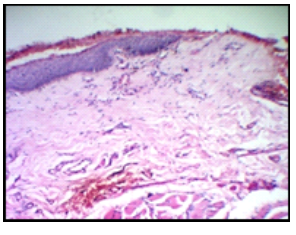


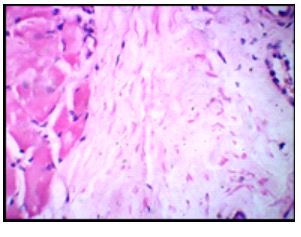
Grade I (10x,40x)





Grade II (10x, 40x)





Grade III (10x,40x)

Figure 3: Histopathological grades of oral submucous fibrosis (10x & 40x)

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