ORAL SUBMUCOUS FIBROSIS: A COMPARATIVE CLINICO-HISTOPATHOLOGICAL STUDY AMONG THE POPULATION OF PATNA.

Dr. Jazib Nazeer⁎1, Dr. Rohit Singh2, Dr. Supriya Singh3, Dr. Abhishek Kumar4, Dr. Tanoj Kumar5 and Dr. Avanindra Kumar6

1Lecturer, Department of Oral Pathology, Patna Dental College & Hospital, Patna, Bihar, India.
2Lecturer, Department of Prosthodontic Crown Bridge and Implantology, Patna Dental College & Hospital, Patna, Bihar, India.
3Lecturer, Department of Oral Medicine and Radiology.
4Private Consultant, Department of Oral Pathology, Maharashtra, India.
5Professor and Head, Department of Oral Pathology, Patna Dental College & Hospital, Patna, Bihar, India.
6Reader, Department of Oral Pathology, Patna Dental College & Hospital, Patna, Bihar, India.

ABSTRACT

Introduction: Oral submucous fibrosis (OSF) is a precancerous condition associated with the use of betel/areca nut in various forms. It is characterized by restricted mouth opening, tongue protrusion and cheek rigidity. Aim and Objective: To correlate the clinical staging with histopathological grading in OSF patients. Materials and Methods: A hospital-based study at Patna Dental College, Patna was done on 200 OSF cases. A detailed history of each patient was recorded along with clinical examination. Punch biopsy was performed for histopathological correlation. Clinical staging of the disease in terms of the ability to open one’s mouth was correlated with histopathological grading. Results: The male to female ratio of OSF cases was 5:1. All forms of areca nut products were associated with OSF. Chewing of panmasala was associated with early presentation of OSF as compared to chewing of other products of areca nut. Conclusion: statistical analysis showed that there is no significant correlation between clinical staging and histopathological grading. The possibility of
difference in the severity and extent of fibrosis in different regions of the oral mucosa and involved muscles were considered as contributory factors for this variation.

**KEYWORDS:** Oral submucous histopathological with OSF.

**INTRODUCTION**

Oral sub mucous Fibrosis is a well known clinical entity since the time of sushruta when it was known as Vidari.\(^1\) It has been a subject of controversy ever since Schwartz\(^2\) described an arcane and inexplicable Fibrotic condition affecting the oral cavity in 5 Indian women of East Africa in 1952. Pindborg and Sirsat\(^3\) described oral sub mucous fibrosis as an insidious Chronic disease affecting any part of the oral cavity and sometimes the Pharynx although occasionally preceded by or associated with vesicle formation, it is always associated with a juxta-epithelial inflammatory reaction followed by a fibro elastic change of the lamina propria with epithelial atrophy leading to stiffness of oral mucosa and causing trismus and inability to eat.

The present study had been undertaken to correlate the clinical staging of mouth opening with histopathological grading in OSF patients.

**MATERIALS AND METHODS**

A total of 200 cases which were clinically diagnosed as OSF were selected for this study. Informed consent was obtained from each subject. A detailed case history and clinical examination was done in visible light using a mouth mirror and a probe in the Department of Oral Pathology. Clinical criteria for the diagnosis of OSF were difficulty in opening the mouth and associated blanched oral mucosa with palpable fibrous bands along with burning sensation while consuming hot and spicy food. A clinical sign like interincisal mouth opening was measured using divider and scale from the mesioincisal angle of upper central incisor to the mesioincisal angle of lower central incisor and recorded in millimeters. Local anesthesia was given and incisional biopsy was done from the region where fibrous bands were palpable. Sutures were placed and cotton was kept in the biopsy site and postsurgical instructions were given. The specimens were preserved in 10% formalin for further laborotary procedures.

OSF cases were clinically categorized into three clinical stages according to their ability to open the mouth. *Kiran Kumar ET al.*\(^4\)
Stage I – Mouth opening ≥ 45 mm
Stage II - Restricted mouth opening 20-44 mm
Stage III - Mouth opening < 20 mm

The biopsy tissue was processed for paraffin embedding. Sections of 5 micrometer thickness were used for Haematoxylin and Eosin (H & E) staining. The sections were studied under a binocular light microscope. The histopathological grading followed in the study Kiran Kumar et al.[4]

Grade I- loose, thin and thick fibers.
Grade II- loose or thick fibers with partial hyalinization.
Grade III- complete hyalinization.

Statistical analysis
Data analysis and database management were done using SPSS (Statistical Package for Social Science) version 11. Person’s Chi-square test was done to determine the association between variables. A significance level of p<0.05 was used for all tests and comparisons.

RESULTS AND DISCUSSION
The study included a total of 200 subjects of OSF. Data was collected, results were tabulated and statistical analysis was done.

In the present study, the age of the patient was ranging from 18-49 years with a peak incidence from 23 to 39 years of age. Half of the study population was in the age group of 20-29 years. Younger age group affected more with OSF than the older age group. The mean age of occurrence was lower in males than in females and the difference was statistically significant (P<0.027). Correlation of gender with clinical staging and histopathological grading. Of the 200 cases of OSF studied, 168 (84%) cases were males and 32 (16%) cases were females. In this study, male to female ratio was 5:1. (TABLE-1 and 2).

<table>
<thead>
<tr>
<th>Table 1: Gender V/S Clinical Staging</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE I (%)</td>
</tr>
<tr>
<td>STAGE II (%)</td>
</tr>
<tr>
<td>STAGE III (%)</td>
</tr>
</tbody>
</table>
Table 2: Gender V/S Histopathological Grading.

<table>
<thead>
<tr>
<th>Gender</th>
<th>GRADE I (%)</th>
<th>GRADE II (%)</th>
<th>GRADE III (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>24(14.28%)</td>
<td>88(52.38%)</td>
<td>56(33.33%)</td>
</tr>
<tr>
<td>FEMALE</td>
<td>00(00%)</td>
<td>20(62.50%)</td>
<td>12(37.50%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>24(12%)</td>
<td>108(54%)</td>
<td>68(34%)</td>
</tr>
</tbody>
</table>

Any significant correlation between clinical staging and histopathological grading was not found in the current study. The correlation between clinical staging of mouth opening and histological grading of fibrosis did not show any statistical significance. OSF, a potentially premalignant condition of the oral cavity and oropharynx has been a subject of extensive research since the last 50 years. It occurs predominantly in Indians and people of south East Asian Origin, with sporadic cases being reported from other parts of the globe like USA, UK, China and South Africa. Extensive studies have been done by various workers on epidemiology, etiological factors and clinical parameters across the globe, but no breakthrough has been reported. Earlier literature focuses on the studies done by Joshi, Shirat and Khanolkar, ABN Rao and various other workers pertaining to etiology, clinical features, histopathological features and malignant potential of the disease. In the present study, the age of the patient was ranging from 18-49 years with a peak incidence from 23 to 39 years of age half of the study population was in the age group of 20-29 years. The mean age in our study was 29 years consistent with 29.04 years by Katharia and 30 years by Maher. This observation is close to the study done by Pindborg et al. which reported the maximum number of OSF cases in the age group of 40-49 years in their study. This changing trend of the disease presently indicates that involvement of more number of younger age group and this could be because of increased social encounters and economic liberty they get at this age in a rapidly developing nation like India. In the present study, patients had one or the other habit of chewing panmasala, betel quid alone or in combination, of which areca nut was one of the major constituents. In our study group, the patients had the habit of chewing either raw areca nut or the commercial areca nut products. Out of 200 patients, 80 (40%) patients chewed panmasala, 30% chewed betel nut and the remaining 30% chewed betel quid. We also observed that the mean duration of the habit in those who chewed betel quid was eleven years while it was ten years for betel nut chewers and nine years for panmasala chewers. The comparison of duration of habit was not statistically significant. This was consistent with the observation made by Shah who stated that the total duration of the chewing habit was not significantly correlated to OSF. It was also found that the patients who used panmasala with a greater frequency/day developed OSF with a shorter duration of the habit. This means
that the exposure to the total burden of various harmful substances in a given period i.e daily consumption was more significant than the total duration of the habit. A similar observation was also reported by Maher who stated that the daily consumption rate appears to be much more significant with respect to risk than the life long duration of the habit.\textsuperscript{[4]} In addition, onset of OSF changes occurred earlier with panmasala chewing compared with areca nut/quid chewing. Absence of betel leaf, which has anti-oxidant properties and a consequently higher dry weight proportion of areca nut were responsible for early development of OSF and this emphasizes the important role of betel/areca nut in etiology of OSF.\textsuperscript{[4]} Of the 200 cases of OSF studied, 168(84\%) cases were males and 32 (16\%) cases were females. A literature survey shows a wide variation in age and sex distribution of OSF. A male predominance in OSF cases was shown by Sinor et al.\textsuperscript{[5,6]} in India. In our study we observed that male to female ratio was 5:1. A similar finding was observed by Dave who stated that male to female ratio was 2.3:1.\textsuperscript{[5]} It has been observed that OSF can affect any or all parts of the oral mucosa, but buccal mucosa remains the most commonly involved site followed by involvement of soft palate uvula, lips, tongue and floor of the mouth as has been observed in the present study as well as in the previous studies of ABN Rao, Pindborg and Dave.\textsuperscript{[5]} It is reported that the average mouth opening was 47.5 mm and 44.6 mm in males and females respectively, based on inter-incisal distance. We grouped our OSF patients into three clinical stages according to Ranganathan ET al.\textsuperscript{[4]} Out of 200 cases, 24 were found to be in stage I, 136 in stage II and 40 in stage III. Clinically maximum numbers of cases were found in stage II. The reason for this could be attributed to the wide range of mouth opening in clinical stage II i.e 20-44 mm. Similar findings were observed by Tupkari in his study on 101 cases and he reported maximum cases belonging to stage II and III.\textsuperscript{[5]}

### TABLE 3- Clinical Staging V/S Histopathological Grading.

<table>
<thead>
<tr>
<th></th>
<th>GRADE I</th>
<th>GRADE II</th>
<th>GRADE III</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE I (%)</td>
<td>08(33.33%)</td>
<td>16(66.67%)</td>
<td>00(00%)</td>
<td>24(12%)</td>
</tr>
<tr>
<td>STAGE II (%)</td>
<td>12(08.82%)</td>
<td>72(52.94%)</td>
<td>52(38.23%)</td>
<td>136(68%)</td>
</tr>
<tr>
<td>STAGE III (%)</td>
<td>04(10%)</td>
<td>20(50%)</td>
<td>16(40%)</td>
<td>40(20%)</td>
</tr>
<tr>
<td>TOTAL (%)</td>
<td>24</td>
<td>108</td>
<td>68</td>
<td>200</td>
</tr>
</tbody>
</table>

OSF is a disease of altered collagen metabolism. The lesion is characterized by increased collagen fiber formation in the initial stages followed by formation of dense collagen fibre bundles and different degrees of hyalinization. This alters the flexibility of the mucosal tissue leading to restriction in the ability to open the mouth.\textsuperscript{[8]} Out of 200 cases, 24 were in histopathological grade I, 108 in grade II and 68 in grade III and 52\% of the males and 62\%
female were in grade II. 45% of the patients in grade II had a habit of chewing commercially available panmasala. 47% of the patients in grade III had a habit of chewing betel/areca nut. So betel/areca nut and panmasala as compared to betel quid is more responsible for development of OSF, this could be probably due to use of more dry weight of areca nut and tobacco. Similar findings were observed by Pindborg and Hamner that the degree of histological changes mostly depends upon amount of betel/areca nut and tobacco used.\[9\] Haider who studied the clinical and functional grading of 228 OSF patients concluded that the bands are formed initially in the fauces, followed by the buccal and labial areas. This is accompanied by an increase in the severity of the disease as measured by restriction in the ability to open the mouth. In our study, the site of biopsy was in the anterior buccal region, a site accessible to the surgeon to perform punch biopsy. Patients with histopathological grading II could have had more collagenous bands in the posterior region, which could have been fewer in the anterior region. This may be the reason for the shift of some of the patients in clinical stage II to histopathological grade I and of some patients in clinical stage III to histopathological grades I and II. In our study, we did not find any significant correlation between clinical staging and histopathological grading (Table 3). Out of 200 patients, 24 cases were in clinical stage I while 8 were in histopathological grade I. There were 136 cases in clinical stage II while 72 were in histopathological grade II. 40 patients were in clinical stage III, out of which 16 cases had histopathological grading III. Although the maximum numbers were seen in clinical stage II and histopathological grade II. The number of cases seen in clinical stage I (12%) and clinical stage III (20%) showed a marked discrepancy in their histopathological grading. In clinical stage I among the 24 cases, 66.67% were in histopathological grade II and in clinical stage III, among the 40 cases, 50% were in histopathological grade II. Similar findings were observed by Rooban et al.\[10\] and they concluded that the correlation between clinical staging of mouth opening and histological grading of fibrosis did not show any statistical significance.\[10\] The possibility of a difference in the severity and extent of fibrosis in different regions of the oral mucosa and involved muscles were considered as contributory factors for this variation.

**CONCLUSION**

A better understanding of the correlation between clinical staging and histopathological grading can provide to be a good marker for the diagnosis, prognosis and severity of this multifactorial crippling disease. Further research must be aimed into genetic, environmental, immunologic and nutritional interactions in the pathogenesis of OSF. The study points
towards the need for planning oral health education programme for youngsters and teenagers
to stop consuming tobacco in any form.

REFERENCE
submucous fibrosis: A Clinico-histopathologic study in Chennai. Indian J of Dent Res 18:
53-59.
5. Sinor PN, Gupta PC, Murti PR, Bhonsle RB, Daftary DK, et al. (1990) A case control
study of oral submucous fibrosis with special reference to the etiologic role of areca nut. J
Submucous fibrosis. JIAOMR 19: 329-333.
villagers with OSMF. Br J Cancer 24: 253-257.
microscopic study of fibrosis involving muscle in oral submucous fibrosis. Indian J Dent