PREVALENCE AND DISTRIBUTION OF ORAL SUB MUCOUS FIBROSIS BY AGE AND SEX OF THE POPULATION.

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ABSTRACT

Oral sub mucous fibrosis (OSMF) is known to be a chronic, progressive, scarring and precancerous condition occurring in the oral cavity and predominantly seen in the Indian subcontinent and SouthEast Asia. This condition is commonly associated with individuals with excessive areca nut chewing habit, vitamin B and iron deficiency as well as the effects of autoimmunity, genetic and environmental factors. The aim of the study was to analyse the prevalence and distribution of OSMF in Indian patients reporting to the hospital. The sample size consisted of 558 patients with a history of chewing habits and from that sample, 95 was diagnosed with OSMF. Their age, gender, chief complaint, and chewing habits were noted from patient records and the data of 86000 patients at the institution between June 2019 to March 2020. Based on the distribution of age groups, a higher prevalence of OSMF was seen in an age group of 41-50 year olds (27.4%) and a lower prevalence was seen in an age group of 61-70 year olds (4.2%). Based on the gender distribution, a higher prevalence of OSMF patients were seen in males (92.6%) while a lower prevalence was seen in female patients (7.4%). Within the limits of the study, OSMF is more prevalent in males and the age group of 41-50 years old.

Keywords: OSMF; prevalence; chewing habits; age; gender; pan; gutka; areca nut.

I. INTRODUCTION

In the Indian subcontinent, oral submucous fibrosis (OSMF) is described as a chronic, progressive, scarring and precancerous condition seen in the oral cavity. (Ranganathan et al., 2004) OSMF can also be classified under oral potentially malignant disorders (OPMDs); since it has a high risk of malignant transformation (Muthukrishnan and Bijai Kumar, 2017) which represents the early tissue changes that occur as a result of various habits such as smoking tobacco, chewing tobacco or stress. (Venugopal and Uma Maheswari, 2016) The existence of such a condition can be contributed to various etiological factors such as excessive chilli consumption, Areca nut chewing, vitamin B & iron deficiency. It is also important to note that several autoimmunity, genetic and environmental factors can as well contribute to the formation of OSMF. Individuals who do have OSMF will eventually experience such problems like difficulty in swallowing, speech & hearing defects as well as having a defective gustatory sensation. (Rajendran, 1994)

OSMF is said to be a disease of the oral cavity solely because of its common presence in sites such as the buccal mucosa, labial mucosa, retromolar pad, soft palate and the floor of the mouth. In some rare instances, such fibrotic changes could also be seen in the pharynx, oesophagus and the para tubal muscles of eustachian tubes. As a method of investigation, instead of oral biopsy, salivary diagnostics is considered as the least invasive method for OSMF diagnosis. (Rajendran, 1994; Maheswari et al., 2018) CBCT is commonly used for the assessment of
particularly the soft palate making it an ideal advanced diagnostic imaging modality in the current field of modern dental practice. (Patil et al., 2018) Even with an early diagnosis, detection of metastatic oral lesions can be challenging since multiple investigations are required to even detect the presence of the primary lesion. (Misra et al., 2015)

At an earlier stage of the disease, patients would have experienced symptoms like burning sensation, hypersalivation/xerostomia and the appearance of a marble-like mucosal blanching. (Rajendran, 1994) In later stages, the mucosal tissues will have a leathery and inelastic structure with palpable fibrous bands that will ultimately lead to restriction of mouth opening. (Rajendran, 1994; Eipe, 2005; Gupta et al., 1999) As OSMF is considered an oral potentially malignant disorder, in cases where it does develop into cancer through non-surgical treatments, oral mucositis would also become an inherent outcome of the chemotherapy and radiotherapy when these patients are subjected to it. (Chaitanya et al., 2017) Otherwise, the administration of vitamin C could at least provide some form of pain reduction and antioxidant properties to cancer patients which in turn improves their quality of life. (Chaitanya et al., 2018)

Even though OSMF is considered to be multifactorial, the most consistent factor that often leads to the formation of OSMF is the patient's chewing habits in the form of quid. By definition, quid is a "a substance, or mixture of substances, placed in the mouth or chewed and remaining in contact with the mucosa, usually containing one or both of the two basic ingredients, tobacco and/or areca nut, in raw or any manufactured or processed form". (Zain et al., 2007) Areca nut can be consumed by itself or as a combination with other ingredients. For example, pan or otherwise known as betel quid is made up of not only areca nut but also slaked lime wrapped in a betel leaf (Piper betel). (Zain et al., 2007; Choudhury et al., 2015; Subha and Arvind, 2019) Gutka on the other hand is a mixture of both areca nut and tobacco. (Aziz, 2010) It is considered to be the most abundantly used smokeless tobacco (SLT) form in India. (Muthukrishnan and Warnakulasuriya, 2018) In this day and age, the sudden growth in gutka consumption can be attributed to its availability, attractive packs, longer shelf life and its low cost. (Babu et al., 1996) (Subha and Arvind, 2019) When a patient’s habits are of concern, at the end of day, a way of prevention is always better than cure. (Muthukrishnan, Bijai Kumar and Ramalingam, 2016)

In this study, the aim was to analyse the prevalence as well as the distribution of OSMF patients not only based on their age and sex, but also by evaluating their chewing habits. With that being said, by analysing such factors, a better understanding of both the prevalence and incidence of OSMF can be obtained particularly in a specific population. Moreover, since oral diseases counts as a major public health concern, (Subashri and Maheshwari, 2016) this form of study could potentially provide a proper guidance in the administration of health services in regard to this field of oral disease especially as a model for countries that requires an advanced training curriculum in oral medicine (Steele et al., 2015) By recognizing the factors contributing to the formation of OSMF, it can further help in the understanding of the natural history of this oral disease. (Kumar et al., 2007) Dentist's role in patient care is essential. (Dharman and Muthukrishnan, 2016) Thus, through a clinical perspective, this will then help in proper diagnosis and treatment planning. (Rohini and Kumar, 2017). Previously our team has a rich experience in working on various research projects across multiple disciplines ((Neelakantan et al., 2015; Ramamoorthy, Niveditha and Divyanand, 2015; Abdul Wahab et al., 2017; Eapen, Baig and Avinash, 2017; Manivannan et al., 2017; Patil et al., 2017; Ezhilarasen, Sokal and Najimi, 2018; Jeevanandam and Govindaraju, 2018; Ravindiran and Praveenkumar, 2018; Wahab et al., 2018; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Rajeshkumar et al., 2019; Samuel, Acharya and Rao, 2020; Sathish and Karthick, 2020).

II. MATERIALS AND METHODS

A single centre retrospective study was done in an institutional setting. The ethical approval was received from the institution’s ethical committee. The study involved selected patients’ data who had a history of chewing habits and was diagnosed with OSMF. The necessary approvals in gaining the data were obtained from the institutional ethical committee (SDC/SIHEC/2020/DIASDATA/0619-0320). The number of people involved in this study included 3 people (guide, reviewer and researcher).

Selection of Subjects:

From a total case record of 558 patients with a history of chewing habits, a total sample size of 95 who were diagnosed with OSMF from the period of June 2019 to April 2020 were selected for this study. There were three people involved in this study (guide, reviewer, and researcher). All available data were taken into consideration.
Data Collection:
The patient’s details were retrieved from the institution’s patient record management software (Dental Information Archiving Software). Data regarding patients' age, gender, presence of OSMF and their chewing habits were taken into consideration for this study. Cross verification of the data was done with the help of photographs. The data was manually verified, tabulated and sorted.

Inclusion Criteria:
All patients who had a history of chewing habits. All patients are diagnosed with OSMF. All age groups were taken into account.

Exclusion Criteria:
All patients with systemic illnesses. Repetitive records were excluded as well.

Statistical Analysis:
The tabulation of data was analysed using SPSS software (IBM SPSS Statistics 26.0). The method of statistical analysis that was used in this study was the Chi-square test to compare two proportions. The analysis was done for: age, gender, presence of OSMF and their chewing habits.

III. RESULTS AND DISCUSSION
Out of a total of 86000 patients, only 558 (6.5%) patients had a history of chewing habits [Figure 1]

Age and Gender
Based on the age distribution, the highest prevalence of OSMF was seen in the age group of 41-50 years old (27.4%) while the lowest prevalence was seen in the age group of 61-70 years old (4.2%). [Figure 2]

In regard to the gender distribution, OSMF was most commonly prevalent in males (92.6%) compared to females (7.4%). [Figure 3]

Chewing Habits
In our study, pan (36.8%) was seen to be the most practiced chewing habit followed closely by areca nut (31.6%), gutkha (14.7%), hans (13.7%) and the least practiced was mawa (3.2%). [Figure 4]

Age Group and OSMF
Among the 558 habitual chewers, the prevalence of OSMF was found to be the highest in the age group ranging from 41-50 years old (4.7%) while the lowest was seen in the age group ranging from 61-70 years old (0.7%) [Figure 5]

When the correlation between the gender and the presence of OSMF was analysed, it showed a statistical significance between them (p=0.00).

Age Group and Chewing Habits
Areca nuts was the most prevalent habit in the age group ranging from 41-50 years old (11.6%) while the least prevalent in the age group ranging from 61-70 years old (2.1%). Gutka was more commonly seen in the age group ranging from 21-30 years old (7.4%) while the least seen in the age group ranging from 31-40 years old (2.1%). Meanwhile, hans was the most prevalent habit in the age group ranging from 31-40 years old (7.4%) while the least prevalent in the age group ranging from 41-50 years old (1.1%). Mawa was more commonly seen in the age group ranging from 31-40 years old (2.1%) while the least seen in the age group ranging from 41-50 years old (1.1%). On the other hand, pan was more commonly seen in the age group ranging from 31-40 years old (10.5%) and 41-50 years old (10.5%) while the least seen in the age group ranging from 61-70 years old (2.1%) [Figure 6]
When the correlation between the age group and chewing habits was analysed, it showed no statistical significance between them (p=0.29).

Gender and OSMF

Among the 558 habitual chewers (525 males and 33 females), the prevalence of OSMF was found to be 17.0% (95 out of 558) with a male to female ratio of 35:3 (88:7). [Figure 7]

When the correlation between the gender and the presence of OSMF was analysed, it showed no statistical significance between them (p=0.51).

Gender and Chewing Habits

In females, areca nut (57.1%) was the most prevalent habit, followed by pan (28.6%) and the least prevalent being gutkha (14.3%). However, in males, the most prevalent habit was pan (37.5%), followed by areca nut (29.5%), equally both gutkha (14.8%) as well as hans (14.8%) and least prevalent being mawa (3.4%). [Figure 8]

When the correlation between the gender and chewing habits was analysed, it showed no statistical significance between them (p=0.56).

In this current study, it showed that there was a lower prevalence of OSMF in patients with known chewing habits. Similar to a study done by Nigam NK et al, he found that only 6.3% of patients with chewing habits were diagnosed with OSMF. (Nigam et al., 2014)

Based on the age group, OSMF was at a highest prevalence rate in the age group of 41-50 years old and the least in the age group of 61 to 70 years old. Contrasting to our study, a study that was done by Kumar S et al found that OSMF were common in 20 to 30 year olds while according to a study done by Srivastava R et al, it showed a higher prevalence in 30 to 40 year olds. (Srivastava et al., 2019)(Kumar, 2016) The male predominance could be due to easy accessibility for males to use areca nut and its products more frequently than females. The difference in the findings could also be explained by the difference in each study population.

Based on the gender distribution, the highest prevalence of OSMF was in males while the least was in females. Similar to that of the findings by Srivastava R et al and Nigam NK et al, both studies found that OSMF was of higher prevalence in males with findings of 97.33% and 67.8% respectively (Kumar et al., 2007)(Nigam et al., 2014) The higher involvement of males in all studies, reflects their early exposure to the abusive habits when compared with females.

When chewing habits of all the diagnosed OSMF patients were assessed, it showed that pan was the most used while the least practiced chewing habit was mawa. Other studies from India which were reported by Nigam NK et al and Kumar S et al both showed a prevalence in gutkha chewing habits which was different from our findings. Gutkha chewing was said to be prevalent due to various factors which primarily could be due to the easy availability of attractive, tiny, multi-coloured gutka packets. (Nigam et al., 2014; Kumar, 2016)

Throughout this study, some limitations were encountered including a small sample size since the data was obtained from only the existing reports. Moreover, the time frame in which the records were obtained was limited to only about 10 months. This study was also only focused on the city population. Thus, the study demographic was limited in scope. Our institution is passionate about high quality evidence based research and has excelled in various fields (Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020). We hope this study adds to this rich legacy.

In the future, epidemiological studies similar to this nature should be conducted to involve an even bigger population. Further investigations are also needed to disclose more accurate results.
IV. CONCLUSION

Within the limitations of this study, Oral Submucous Fibrosis showed a higher prevalence in males and within the age group ranging between 41-50 years old. In regard to the chewing habits, the usage of pan showed the highest prevalence.

REFERENCES

Figure 1: This bar chart represents the percentage distribution of the presence of chewing habits in patients visiting the hospital. X-axis represents the presence of chewing habits. Y-axis represents the percentage of patients visiting the hospital. The sample size consists of 6.5% of patients with chewing habits (orange) and 93.5% (green) of patients without chewing habits.
Figure 2: This bar chart represents the percentage distribution of the age groups in patients with OSMF. X-axis represents the age group. Y-axis represents the percentage of patients with OSMF. A higher predilection of OSMF was seen in the age group ranging between 41-50 years old (dark red).
Figure 3: This bar chart represents the percentage distribution of the gender in patients with OSMF. X-axis represents the gender. Y-axis represents the percentage of patients with OSMF. A higher predilection of OSMF was seen in males (turquoise).
Figure 4: This bar chart represents the percentage distribution of the chewing habit in patients with OSMF. X-axis represents the chewing habit. Y-axis represents the percentage of patients with OSMF. A higher predilection of OSMF was seen in patients with a pan chewing habit (light blue).
Figure 5: This bar chart shows the association between the age group and the presence of OSMF in patients with chewing habits. X-axis represents the age group and Y-axis represents the percentage of patients with chewing habits. OSMF has a higher predilection in age group ranging from 41-50 years old and the lowest predilection in the age group ranging from 21-30 years old. There is a statistical significance between the age group and the presence of OSMF in patients with chewing habits.
habits. (Chi-square test; p-value=0.00-significant).

Figure 6: This bar chart shows the association between the age group and the type of chewing habits in OSMF patients. X-axis represents the age group and Y-axis represents the percentage of patients with OSMF. Areca nuts (peach) are the most commonly practiced chewing habit in the age group ranging from 41-50 years old, while the least commonly practiced in the age group of 61-70 years old. However, there is no statistical significance between the age group and the chewing habits in patients with OSMF. (Chi-square test; p-value=0.29-not significant).
Figure 7: This bar chart shows the association between the gender and the presence of OSMF in patients with chewing habits. X-axis represents the gender and Y-axis represents the percentage of patients with chewing habits. Males with chewing habits are more commonly diagnosed with OSMF compared to females. However, there is no statistical significance between the gender and the presence of OSMF in patients with chewing habits. (Chi-square test; p-value=0.51-not significant).
Figure 8: This bar chart shows the association between the gender and the type of chewing habits in OSMF patients. X-axis represents the gender and Y-axis represents the percentage of patients with OSMF. Pan (light blue) was seen to be more prevalent in males while areca nuts (peach) was more prevalent in females. However, there is no statistical significance between the gender and the chewing habits in patients with OSMF. (Chi-square test; p-value=0.56-not significant).