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Assessment of risk factor for oral submucous fibrosis in patients- a retrospective study

AMANTHI GANAPATHI[1], JAGADISH VIJAYAKUMAR[2]*, M.JEEVITHA[3]

[1]Saveetha Dental college & Hospitals, Saveetha Institute of medical and Technical science, Saveetha University, Chennai, India
[2]Senior Lecturer, Department of oral & maxillofacial surgery, Saveetha Dental college & Hospitals, Saveetha Institute of medical and Technical science, Saveetha University,
Chennai, India
[3]Senior lecturer, Department of Periodontics, Saveetha Dental college & Hospitals, Saveetha Institute of medical and Technical science, Saveetha University, Chennai, India
*Corresponding Author
Email ID: 151501058.sdc@saveetha.com[1], Jegadishv.sdc@saveetha.com, jeevitham.sdc@saveetha.com

Abstract: Oral submucous fibrosis(OSMF) is a precancerous condition progessive disorder which is caused because of the tobacco products usage,consumption of spicy foods.It will cause rigidity of the tongue,lip and palate in the severe cases it will cause limited mouth opening.Parts which gets affected will be oral cavity,pharynx and upper third of esophagus.This study is done to assess risk factor oral submucous fibrosis (OSMF) in patients getting treated in saveetha dental college and hospitals.A retrospective study was conducted in dental hospitals in departments of oral and maxillofacial surgery,department of oral medicine.Patient data was collected from hospital records.In our study we found that use of tobacco smoking (31.2%),pan chewing(34.4%),Tobacco chewing(23.7%), and betel nut chewing(9.7%).Total sample size(n=93) 7 female patients ,86 male patients.Most affected age group will be (41-50 years old)-26.9%.Our study pan chewing and tobacco products among the 41-50 years old male population were significantly high in association with the risk factor of OSMF.

Keywords: Oral submucous fibrosis; Pan chewing; Risk factor; Tobacco smoking

INTRODUCTION

In modern literature, this condition was first described by Schwartz as 'atrophica idiopathica mucosa oris' in 1952[(Das, 2014)]'The term 'oral submucous fibrosis' was coined by Joshi in 1953[(Praveen *et al.*, 2015)].Oral submucous fibrosis(OSMF) is a precancerous condition progessive disorder which is caused because of the tobacco products usage,consumption of spicy foods.It will cause rigidity of the tongue,lip and palate in the severe cases it will cause limited mouth opening.Parts which gets affected will be oral cavity,pharynx and upper third of esophagus[(Karthik *et al.*, 2012)]

The prevalence in india various from 0.03%-3.2%[(Jagadish, Jagadish and Mehta, 2012)].The main clinical feature of oral submucous fibrosis will be blanching of mouth and in severe cases difficulty in opening,the mouth opening will differ depending on the grading of OSMF.The cheek mucosa will become rigid and vertical bands can be palpated.Since it is benign condition it has a high chance development into cancer.The precancerous nature of this condition was first described by Paymaster in 1956.The malignant transformation rate will be 7-13% if left untreated and unattached.They mostly turn into oral squamous cell carcinoma[(Paymaster, 1956; Hattab and Amin, 2005; Tilakaratne *et al.*, 2006; Dyavanagoudar, 2009)].In Immunodeficiency patients where they are more prone to infection dentist must have knowledge about it,oral submucous fibrosis accounts for 2% of oral lesion in immunocompromised patients[(Ranganathan *et al.*, 2008; Kumar, 2017)].They need to assess their patients preoperatively for dental anxiety and use appropriate patient management techniques based on the outcomes of the assessment[(Mp, 2017)],this is important factor which needs to kept in mind because it will be easy for the dentist to gain the information from the patient when they are less anxious.And the awareness level about basic dental procedures to the common people is mandatory because of the people must have a idea on where they can approach if which problem occurs to them.In a study it was found that general population had good knowledge about the basic procedures done by the dentists[(Patturaja and Pradeep, 2016)].

It has been postulated that external stimuli such as areca nuts may induce OSMF by increasing the levels of cytokines in lamina propria and also increasing the production of cytokines by the peripheral mononuclear cells[(Haque *et al.*, 2000)]. The epidemiology of OSMF strongly suggests an individual susceptibility which

could be cytokine based, especially as the initial feature of OSMF is chronic inflammation accompanied by fibrosis. Also upregulation of proinflammatory cytokines ie IL-6 and IL-8 has been seen. It may be due to the T-cell activation, which occurs secondary to the chronic inflammation. Also an upregulation of certain fibrogenic cytokines such as TNF-, TGF-, platelet-derived growth factor, basic fibroblast growth factors is seen in OSMF. An under expression of antifibrotic cytokine interferon-gamma may also contribute to increased fibrosis. The above features are suggestive of an altered immune response in circulating monocytes along with an increase in the number of local antigen presenting cells and lymphocytes in OSMF patients. This increases the genetic susceptibility of these patients and thus causes the penetration of arecoline and arecaidine into the oral mucosa [(Haque *et al.*, 1998)].

The management of oral submucous fibrosis aims to improve mouth opening and relieve the symptoms. Severe degree of trismus is a challenging surgical problem. Various surgical treatment modalities have evolved but the mainstay is release of fibrosis by excision of fibrous bands with or without grafts. Reconstruction of the defect after incision and release of fibrous bands is done with a variety of options such as skin grafts[(Yen, 1982)]. In study the application of extended nasolabial flap versus buccal fat pad graft in the surgical management of oral submucous fibrosis to achieve acceptable mouth opening and reduction of symptoms after release of fibrosis, to improve masticatory efficiency and speech of the patient and to reduce the long term morbidity and mortality of the patient[16].Analgesic are administer to patients after the surgical management along with with some mouth opening exercises.Analgesic such as paracetamol(500mg) and ketorolac(10mg) after dental extractions may be used [17].Along with analgesic antibiotics are also given to patients undergoing surgical management of OSMF such as antibiotic prophylaxis which is given in patients in infective endocarditis[(Kumar and Sneha, 2016)]. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)

In our study we will be evaluating the risk factor causing oral submucous fibrosis in patients attending a hospital setting in Chennai.

MATERIALS AND METHODS

Study design and Study setting

The study was a retrospective study,where the data of the patients were collected from a hospital based patient record and analysed the data of 86000 patients.Patients with oral submucous fibrosis reporting to the department of oral medicine and department of oral and maxillofacial surgery were analyzed.There were two reviewers present in the study for data collection and analysis.The patient's history was reviewed to check up on their habits and the duration of habit during the period of June 2019-March 2020.

Participants

Inclusion criteria

1. Patients with substance abuse were selected
2. Patients with all ranges of Oral submucous fibrosis

Exclusion criteria

1. Patients who have already undergone surgical management for oral submucous fibrosis.
2. Patients with major physical disabilities
3. Patients with HIV-AIDS
4. Patients providing unreliable information

Study size

The sample size of the study is 93 South Indians which includes 83 males and 7 females in the study.

Ethical clearance

The ethical clearance was(SDC/SIHEC/2020/DIASDATA/0619-0320) given by the institutional ethics committee, Saveetha Institute of medical and Technical science, Saveetha University.

Statistical analysis

The data was collected from patient reports in hospitals, The obtained data was entered in Microsoft excel 2012 .Then exported to statistical package for social science for windows (version 20.0.SPSS Inc., Chicago III,USA)and all subjected to statistical analysis. Chi square test was employed with a level of significance set at P 0.05.

RESULTS AND DISCUSSION

In our present study the total patient affected with oral submucous fibrosis accounts for 93.and Figure 1-Age of the patients who is affected with Oral submucous fibrosis.Out of which patients with age group of 20-30 years is 25.8%,patients within the age group of 31-40 years old is 24.7%,41-50 years old patients are 26.9% and patients above 51 years is 22.6%.This shows that patients with the age range if 41-50 years old are affected more. Figure 2-Gender of the patients who is affected with oral submucous fibrosis,In this study there were 86 male patients 92.47% and 7 female patients 7,5% .This report relives that male population are affected more when compared to female population. Figure 3-Various products used by the patients affected with oral submucous fibrosis,the main topic of discussion the risk factors causing the oral submucous fibrosis tobacco chewing accounts of 23.91% ,tobacco smoking-31.52%,betel nut chewing is 9.7% and pan chewing stands for 34.78%.So, in our study patients has got more of pan chewing habit and tobacco smoking followed by tobacco chewing and lastly betel nut chewing which accounts very minimal when compared to others Figure 4-Duration of the habit for patients affected with oral submucous fibrosis,the duration of this habit is taken into consideration in our study patients with habit for less than 5 years are 25.8%,6-10 years are 32.3% and 11-20 years stand for 41.9%.we can say that patients with habit more than 11 years are affected more in our study.Figure 5 shows the correlation of the risk factor and the duration of the habit.In tobacco chewing habit patients with >5 years of habit is 4.35%,6-10 years is 7.61%,11-20 years-11.96%.In tobacco smoking habit patients with >5 years of habit is 8.70%,6-10 years is 9.78%,11-20 years-13.04%.In betel nut chewing habit patients with >5 years of habit is2.17%,6-10 years is2.17%,11-20 years-5.43%.In Pan chewing habit patients with >5 years of habit is 10.87%,6-10 years is 11.96%,11-20 years-11.96%.All the risk factor had similar distribution of duartion expect pan chewing with no statistically significant differences.(Pearson Chi square test;P=0.878,P>0.05).

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)This study was done to find out the risk factors associated with oral submucous fibrosis and their duration of usage.It was found that there is a male predominance and there are similar studies[(Ahmad *et al.*, 2006)-(Hazarey *et al.*, 2007)].The male predilection may be because of the easy availability and acceptability of the tobacco products,along with change in life style.Patients reported with female OSMF were few beaus it was hospital based study maybe they were left untreated or not taken care off.

The mean age group reported for the risk factor for oral submucous fibrosis was 41-50 years old.which was different from the past studies which was done in and at round India.where the mean age was 35 or less than 35.They strongly believed with the evidences available in there side that OSMF is more common in younger group of patients rather than mid or old age people which is contraindicated in our study [22-27].

Pan chewing was the most significant risk factor in our study with the percentage of 34.4% followed by tobacco smoking [19,(Shiau and Kwan, 1979),(Patil *et al.*, 2017)].Pan is sweetened flavored mixture of Areca nut ,slaked lime without tobacco.It is a local product which is available but,when in comparison to north India the availability is less.Because of the lack of awareness it is used by younger population and also causes precancerous conditions among patients who have developed a ignorant attitude towards quitting these habits.Although other studies have documented betel nut as risk factor [(Abhinav *et al.*, 2019),(Jeng, Chang and Hahn, 2001)].In indian subcontinent most of heavy duty vehicle drivers tends to consume more of tobacco products and alcohol while driving which often leads to road traffic accidents cause trauma to the patients [(Christabel *et al.*, 2016).(Marimuthu *et al.*, 2017)],while examining the traumatic patients OSMF maybe diagnosed.However betel nut,quid leaf has got many medical values in traditional medicine.But,long time consumption of the product is not advised.In our study the significant value ranges from 11-20 years of consumption which adds on 41% of the affected population.

Patients suffers various difficulties which as difficulty in speech and food consumption as seen in patients having ranula [34].Most of the patient do not report to the dental clinic because they are highly anxious about the treatment Patients phase various problems such as difficulty in speech and food consumption as send in patients having ranula [(Sweta, Abhinav and Ramesh, 2019)].Maintaining oral hygiene is important factor which needs to kept in mind,mouthwashes can be given to patients to balance their oral hygiene status hygiene [(Jesudasan, Abdul Wahab and Muthu Sekhar, 2015),(Kumar and Rahman, 2017)].Given high association of tobacco and tobacco free products which causes precancerous lesion,stringent measures needs to taken by the government regarding the nation wide band on the sales of these products and it not be available to the younger population.Awareness session must be included in the curriculum of shoots and colleges to educate the young growing generation this issue.Camps must be organized on slump regions to give awareness and for conducting regular dental checkup for people.We would like to conclude our study by stating that paan chewing and tobacco smoking causes oral submucous fibrosis in the older male population.Further studies need to be done on different geographic location on large population.Awareness on irreversible but,preventable disease must be

given.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)

AUTHORS CONTRIBUTION

Author1(Amanthi Ganapathi) Carried out the retrospective study by collecting the data and drafting the manuscript after performing the necessary statistical analysis.Author 2(Dr.Jagadish.V) aided in the conception of the topic,participated in the study design,statistical analysis and supervised the preparation of the manuscript and helped in study design and has coordinated in developing the manuscript.All the authors have equally contributed in developing this manuscript.

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Conflict of interest

Nil

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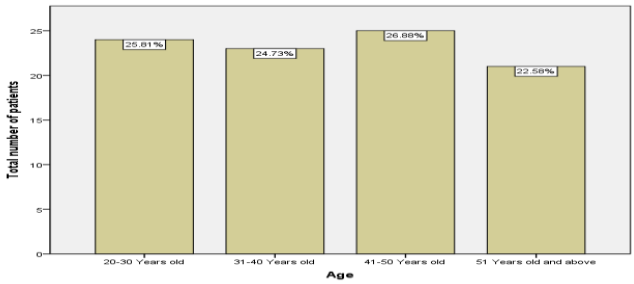

Fig.1: The bar graph shows the age groups of the patients in the study. X-axis denotes the age groups of the patients and the Y-axis shows the total number of patients. Patients aged between 41-50 (26.88%) were mostly affected by oral submucous fibrosis.

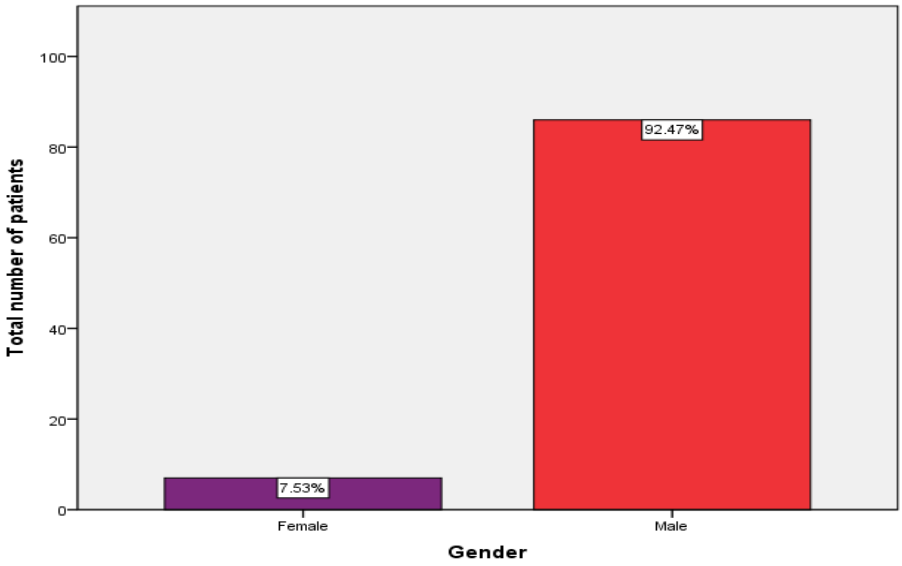

Fig.2: The graph shows the gender of the patients in the study. X-axis shows the gender of the patients and Y-axis shows the total number of patients. Females (violet) constituted 7.53% of the study group and males (Red) constituted 92.49% of the study group.

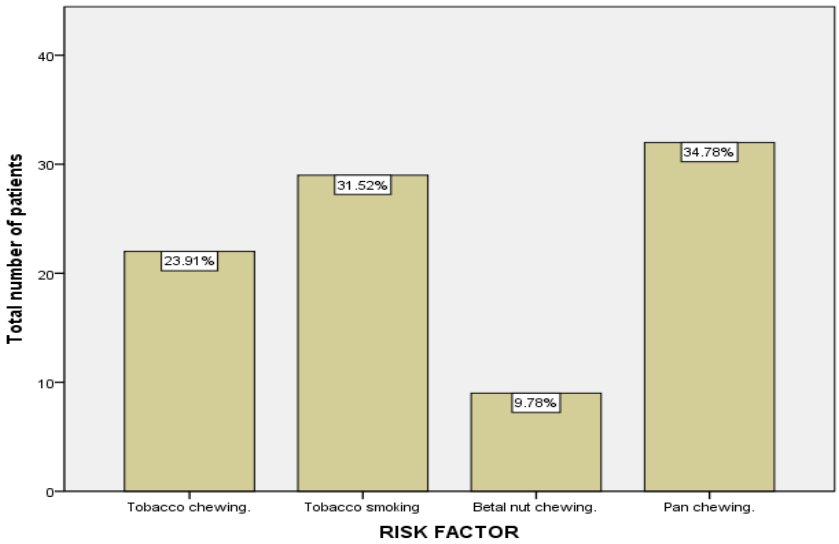

Fig.3: Graph shows the risk factor for oral submucous fibrosis. X-axis shows the different types of products used by the patients and Y-axis shows the total number of patients. It is shown that there is a high prevalence of pan chewing habit (34.78%) among the patients our study

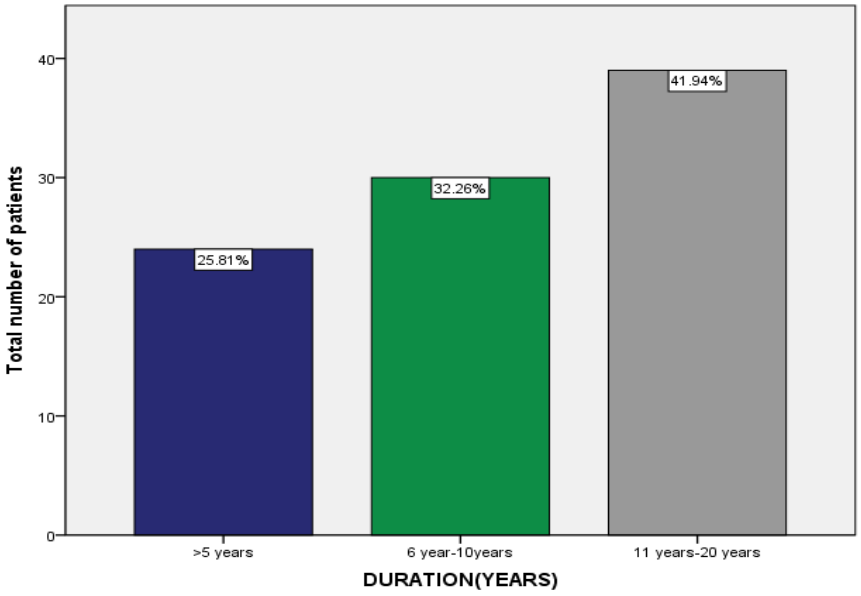

Fig.4: Graph shows the duration of the habit which caused oral submucous fibrosis. X-axis shows the duration in years and y-axis shows the total number of patients. 41.94% of patients had habit history for the duration of 11-20 years (Grey). 32.26% of patients had habit history for the duration of 6-10years(Green). 25.81% of patients had habit history for the duration of >5years(Blue).

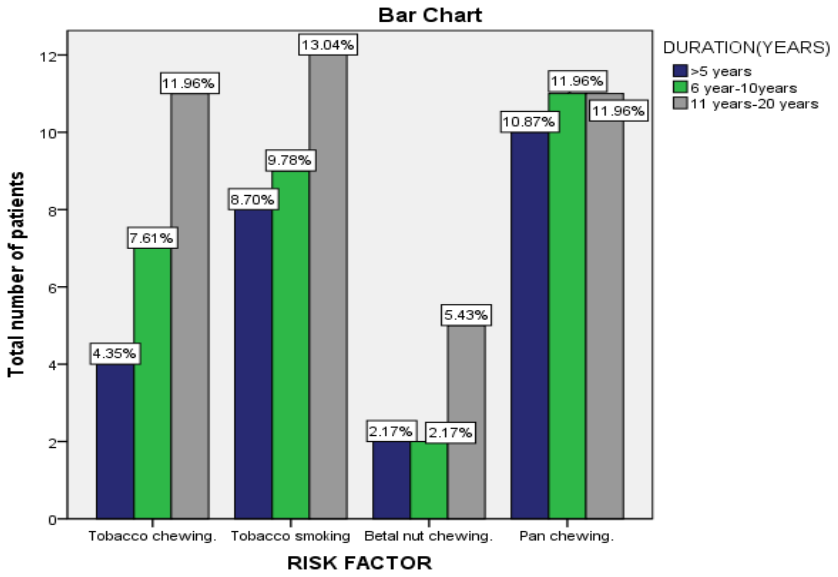

Fig.5: The graph shows the association between the risk factor and the duration of the habit. x-axis shows the risk factor with duration and y-axis total number of patients. All the risk factors had similar distribution of duration except pan chewing with no statistically significant difference (Pearson Chi square test;P=0.878,P>0.05).