

ORAL SUBMUCOUS FIBROSIS - REVISITED

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ABSTRACT

Oral Submucous Fibrosis (OSMF) is accepted to have highest malignant potential than any other oral premalignant lesions. Role of alkaloids and other etiological agents is important in pathogenesis of the disease. This article is aimed to provide an overview of the disease and analysis of 223 cases of OSMF between September 2011 to August 2013 attending ENT and HNS services at Rohilkhand Medical College, Bareilly.

KEY WORDS: - Areca Nut, Arecoline, OSMF.

Introduction

OSMF was first described by Schwartz JJ (1952)¹ as "Atrophica idiopathica musosa oris" in Kenya followed by Joshi SG (1953)² in India. Higher rates of malignant transformation in OSMF have been reported. In this disease there is submucosal fibrosis affecting most of the oral cavity, pharynx and upper third of the oesophagus leading to progressive trismus and dysphagia due to fibrosis.

The disease is predominantly seen in Asian countries, prevalence being more in India. Recent epidemiological data indicate that the number of cases of OSMF has increased rapidly in India from an estimated 2,50,000 cases in 1980 to 2 million cases in 1993. The increase in prevalence may be due to an increase in the popularity and availability of commercially prepared areca nut preparation like gutka or pan masala³ and an increased adoption of this habit by young people due to easy access and effective marketing strategies.⁴

It has been widely suggested that areca nut is the main etiological factor responsible for OSMF. Areca nut is the un-husked fruit of the areca nut tree. Betel nut is the inner seed of the areca nut which is obtained after removing husk. Four alkaloids have been identified in betel nut viz arecoline, arecadine, guvacine and guvacoline of which arecoline is the main agent.

In a habitual betel nut chewers, the amount of tannic acid contained in the betel nut may be the cause of OSMF. The effect of mixed calcium powder and the action of arecoline content in betel nut, affect slaked the vascular supply of oral mucosa and causes neurotropic disorder.

Tobacco, Slaked lime and chiles are known local irritants and causative factors in oral malignancy. A subclinical vitamin B complex deficiency has been suspected to cause vesiculations and ulcerations of the oral cavity in the early phase of OSMF.

Microcytic hypochromic anemia with high serum iron has been reported in submucous fibrosis⁵ but anemia is a cause or a result of OSMF cannot be conclusively explained.

Raised serum immunoglobulin levels of IgA, IgG and IgM suggest oral submucous fibrosis to be an autoimmune disease.

There is a high prevalence of HPV, EBV, HSV infections in OSMF and oral cancer and the etiologic implications of this finding warrants further studies.⁶

Pathogenesis

It has been suggested that oral submucous fibrosis is caused due to the action of arecoline. Arecoline not only stimulates fibroblast proliferation and collagen synthesis, but also decreases its breakdown by forming more stable collagen structure. So there is more collagen availability leading to OSMF.

Various cytokines are increased in oral submucous fibrosis like: -

- Transforming growth factor (TGF- B).
- Platelet derived growth factor (PDGF).
- Basic fibroblast growth factor (bFGF).

These are fibrogenic growth factors stimulate collagen production. Betel nut contains tannin and copper and these have ability to stabilize collagen by cross-linking it. So more Collagen is provided at the site. fibrogenic growth factors that stimulate collagen production.

Decrease in glycogen content in oral muscles may be a factor for muscle degeneration and fibrosis in OSMF. In areca nut chewers there is over activity of muscles due to chewing the hard nut which may lead to glycogen depletion.

Nutritional deficiencies may not play a primary role, but it could accentuate the symptomatology by contributing to epithelial atrophy.

Clinical presentation

The clinical diagnosis is straight forward characterized by blanching and stiffness of Oral mucosa, Trismus, Oral burning sensation, Hypo-mobility of tongue palate and loss of gustatory sensation.

There are two phases of disease

1. Eruptive phase marked by vesicle, Erythema and ulceration
2. Fiber-optic phase characterized by healing of ulcers by fibrosis leading to blanching and stiffness of the oral mucosa.

Material and Method

The present study was conducted in the department of ENT and HNS at Rohilkhand Medical College, Bareilly from august 2011 to August 2013. A total of 223 cases of OSMF attended the OPD out of a total of 53374 ENT attendances. It accounts to prevalence of 0.41% of OSMF.

Submucous fibrosis were diagnosed on the basis of clinical findings involving the oral cavity in the form of ulcers, vesicles, blanching, involvement of the tongue and palate and fibrous bands.

Observations

The prevalence of OSMF was found to be 0.41% in cases attending the OPD. The age incidence was from 11yrs to 67yrs. The youngest patient being 11yrs old male child (Figure 1).



Figure 1: - A 11 years old child of OSMF showing decreased Mouth opening

Out of 223 cases 169 (75.7%) were females and 54 (24.2%) were male. The majority of cases were in 21-50 years age group. The sex distribution in the present study with a male to female ratio of 1:3 indicates a female dominance. (Table 1)

Table 1 Age and Sex Distribution in OSMF cases

Age	Male	Female	Total
11-20	2	0	2
21-30	10	43	53
31-40	15	54	69
41-50	11	31	42
51-60	8	19	27
61-70	8	22	30

The main presenting symptoms were difficulty in opening the mouth (89%) burning sensation in the oral cavity (74%) difficulty in swallowing (27%) Oral ulcers (11%) increased salivation (8%). The mouth opening ranged from 1mm (Figure 2) to complete mouth opening. (>40mm). (Table 2)

Table 2. Oral symptoms in OSMF cases

Symptoms	Cases
Difficulty in opening of Mouth	198 (89%)
Burning Sensation in the oral cavity	165 (74%)
Difficulty in swallowing	60 (27%)
Oral Ulcers	24 (11%)
Increased Salivation	18 (8%)



Figure 2: - Comparison of Patients with OSMF having no mouth opening (Left) and adequate mouth opening (Right)

Involvement was seen in buccal mucosa (89%), Soft palate and uvula (84%) and Lower lip mucosa (68%). The predominance of these sites appears to be due to habit of keeping the tobacco preparations for long at these particular sites. (Table 3)

Table 3. Site of involvement in OSMF

Site	Cases
Buccal Mucosa	198 (89%)
Soft Palate and Uvula	187 (84%)
Lower lips Mucosa	151 (68%)
Tongue	10 (4.5%)
Gingiva	2 (0.89%)
Lips	1 (0.45%)

In our study, we found 10 cases (4.5%) of involvement of tongue and 2 cases of gingival (0.89%)

The tongue in all the cases was smooth, pink, shiny with loss of papilla of a part of tongue to extensive loss of papilla. (Figure 3)



Figure 3: - OSMF Patients showing different extent of glossitis a) Lateral margin, b) Mid Portion, c) Complete

Classically the loss of papilla starts from the tip and lateral margins of the tongue and then gradually progressing to involve the rest of the tongue. Complete loss of papilla was not seen in any of the cases.

The gingiva are surprisingly spared in cases of OSF due to an unknown cause, but we found one case showing fibrosis of the gums (Figure 4)



Figure 4: - Patients of OSMF showing involvement of gingiva.

None of the cases were found in an eruptive phase of the disease, all the cases were having marked signs and symptoms like trismus, blanching and ulceration in the oral cavity. In most of the cases trismus developed very early after starting the use of gutka or tobacco. In some cases it started with in three months of use of the product. The symptoms appeared earlier in females.

The duration of onset of symptoms was different with different brands of products. With certain brands onset was early as compared to other brands (Figure 5), Probably This depends upon the amount of betel nut and lime in the product.



Figure 5: - Different preparations of tobacco commonly available in market

All the cases of OSMF gave history of tobacco, gutka or supari. The appearance of symptoms was early in subjects using the preparation containing lime. Earliest symptoms were seen in cases, keeping these preparations in the mouth for longer time or overnight.

In none of our cases we found evidence of malignancy or any pre malignant conditions irrespective of the stage of the disease.

Discussion

The prevalence of OSF has been found to be 0.41% in the present study. Pindborg *et al*⁷ reported prevalence of 0.04% in Andhra Pradesh to 0.4% in Kerala. Rajendran *et al*⁵ found prevalence to be 0.36% in Kerala, 0.04% in Andhra Pradesh and 0.16% in Gujarat in various house to house surveys.

We found male: female ratio of 1:3 which is contrary to finding of Pindborg *et al*⁸ and Wahi *et al*⁹ who found a male preponderance. It marks a change of trend where females are adopting the habit probably due to more exposure of females to print and electronic media.

It has been observed that all the cases were using gutka, tobacco mixed with lime as an agent responsible for OSF. In study by Pindborg *et al*⁷, 31.8% cases out of the total of 63 cases did not have any chewing or smoking habit.

We found 10 cases (4.5%) of involvement of the tongue in submucous fibrosis, which is surprisingly low as compared to the finding of Pindborg *et al*⁷ who found 60% prevalence of atrophy of the tongue papilla.

We did not find any case of malignancy in the series. The precancerous nature of OSMF was first postulated by Paymaster JC¹⁰ who described the development of carcinoma in 1/3 of OSMF cases attending Tata Memorial Hospital, Mumbai. Malignant transformation in OSMF cases has been reported by many workers.^{4,7,11}

Conclusions

According to available clinical data and present study it appears that the main causative agents for OSMF are the constituents of areca nut, mainly arecoline, whilst tannin may have a synergistic role. Slaked lime which is used with tobacco and is a constituent of most of the commercially available products may play a role in pathogenesis of the disease.

There is no standard treatment protocol, but prevention is the best cure. At the level of society, government and health providers a ban on the products causing OSMF will go a long way in abolishing this disease. In spite of putting a ban on the sale of these products by few state governments, there appears to be an illegal parallel black market selling these products. A stronger administrative will to stop the sale of these products is more important.

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