CLINICAL FEATURES OF LESS-REPORTED ORAL MUCOSAL LESIONS RELATED TO BETEL-QUID CHEWING

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ABSTRACT

In Ernakulam district of Kerala, India, several prospective long-term epidemiologic studies were carried out involving over 27 thousand villagers in house-to-house visits. In these studies in addition to well recognized betel quid associated oral mucosal lesions like oral cancer, leukoplakia, oral submucous fibrosis and oral lichen planus, several other oral mucosal lesions also associated with this habit, having specific clinical features were observed. They included betel-quid chewer’s mucosa, lichen planus-like lesion, betel cheilitis, petechiae and blanching in oral submucous fibrosis. The clinical features of these oral mucosal lesions identified during the studies are described in this paper.

INTRODUCTION

Betel-quid or pan chewing is a widely practiced habit in India and many other countries of Southeast Asia and also by emigrants from these regions to other countries1. The components of betel quid are : betel leaf (Piper betel), slaked lime (Ca (OH)_2), areca nut (Areca catechu), catechu (Acacia catechu), tobacco, condiments, flavouring and sweetening agents. In different geographic locations there are wide variations in the composition of betel quid, type of each ingredient and also in mechanics of chewing the betel quid. These variations may have influence on the occurrence and clinical characteristics of various oral mucosal lesions that are associated with this chewing habit.

Oral cancer is the most serious life threatening oral mucosal lesion associated with betel-quid chewing. Leukoplakia and oral submucous fibrosis which are precancerous and the most frequently reported oral mucosal changes, are also associated with this habit. Oral lichen planus, which is a well recognised oral mucosal condition (probably precancerous), also shows some association with betel quid chewing. The purpose of this paper is to describe the clinical features of some specific lesions that are associated with betel quid chewing habit practiced in Ernakulam district of Kerala, India, but are not as well identified in the literature as distinct entities.

MATERIAL AND METHODS

Study population : In Ernakulam district of Kerala (Fig.1), several prospective, longitudinal, long-term, epidemiologic studies were carried out, covering over 27 thousand villagers in house-to-house visits and over 10 years of follow up3-5. The oral mucosal lesions described in this paper were not target lesions in these studies but were identified as specific entities over the course of the studies.
Betel-chewing habit: In Ernakulam district villagers chew betel quid consisting of betel leaf (Piper betel), shell lime (Ca(OH)$_2$), ripe areca nut (Areca catechu) in a raw form and Vadakan or Jafna leaf tobacco (Fig.2). Typical user first smears ventral surface of a betel leaf with few dashes of shell lime with index finger, folds it and puts it into his mouth and while chewing it, cuts raw areca nut and tosses few pieces of it into the mouth and continues chewing. Lastly a piece of tobacco (0.5g) is cut from rolled tobacco leaf and is added to the bolus which is repeatedly chewed and red salivary juice formed in this process, is spat out from time to time. The bolus is retained in one of mandibular sulcus for about 10 to 30 minutes and when it becomes bland it is spat out. This habit was practiced by 33 percent of men and 35 percent of women in Ernakulam district.

**CLINICAL FEATURES OF ORAL MUCOSAL LESIONS:**

1) **Chewer’s mucosa**

Chewing of betel quid imparts red colour to saliva and stains oral mucosa of the chuffer. This stain can generally be washed with water. In heavily addicted chewers, this habit produces a lesion which is characterized by wrinkled thick blackish-brown mucosal encrustations (Fig.3). These encrustations can be removed with a piece of gauze, at times leaving pinpoint or erosive bleeding areas, particularly at places where encrustation is more firmly attached. Even when encrustations get removed naturally through mechanical action of chewing, patient does not feel discomfort of erosive bleeding areas. The reason perhaps is that astringent effect of the betel quid gradually renders oral mucosa less sensitive to minor ulcerations in the mouth. Generally this lesion is seen on buccal mucosa and mandibular sulcus where the quid is usually kept but occasionally involvement of floor of mouth and tongue is also seen.

In a 10-year follow-up study of 10,287 villagers in Ernakulam district, this lesion had
annual age-adjusted incidence rates of 28.0 and 17.4 per 1000 for men and women betel-quid chewers respectively with peak annual incidence rates for both the genders in the age group of 45-54 years. In a follow-up study of 532 lesions over a three-year period, 26 percent remained persistent, 45 percent regressed spontaneously, and 29 percent recurred. No transformation of this lesion to leukoplakia was observed.

Biopsies from this lesion showed pale staining parakeratin-like surface layer of epithelium containing round nuclear remnants, ballooning vacuolated cells with hyperplastic epithelial changes. These histological changes were similar to changes observed in tobacco-lime user's lesion which was reported earlier.

2) Lichen planus-like lesion

A strong association of oral lichen planus with betel-quid chewing was reported from Ernakulam district. In addition to oral lichen planus, another lesion somewhat similar to it was observed exclusively among betel-quid chewers. This lesion was characterized by presence of white linear, wavy, parallel, non-elevated lines (Fig. 4) which in some instances radiated from central erythematous area (Fig. 5). This striated lesion had lines which were very fine, nonelevated and did not overlap or criss-cross as in typical oral lichen planus. This lesion generally occurred at the site of placement of quid. It was observed that reduction in habit or change in site of placement of quid, the lesion became faint, and regressed completely with stoppage of the habit.

Prevalence of this lesion was 2.1 percent among betel-quid chewers with peak occurrence for men in 35-44 years age-group while for women it was in 45-54 age-group. The annual age-adjusted incidence rates were 2.9 and 4.3 per 1000 for men and women betel-quid chewers respectively. In the follow-up study of 42 lesions over a 4-year period, 79 percent remained stationary, 21 percent regressed and two of the nine regressed lesions recurred.

3) Betel cheilitis

Betel cheilitis is a chronic mucosal lesion characterized by fissuring, scaling and pigmentation changes of the lips. This lesion occurs almost exclusively among people with the habit of betel-quid chewing (Fig. 6). Fissures radiating from muco-cutaneous junction of the lips vary in depth and in severe cases they are painful and bleed on touching. Pigmentation vary from intense black to loss of normal pigmentation of lips. On questioning, the affected individuals reveal amusing misconceptions about possible causative factor; for example they attribute this condition to cold weather 'although the night temperature rarely goes' below 20°C and day temperature below 25°C in this region.

Among 515 betel quid chewers from two villages, specially examined for the presence of
this lesion, 31 (6%) individuals were found to be affected; 20 in the age group 45-64 years. About half of the individuals with this lesion had associated partial or total atrophy of tongue papillae, which could not be explained.

4) Localized blanching of the oral mucosa

Blanching is one of the specific clinical feature of oral submucous fibrosis. In a follow-up study in Ernakulam district, it was observed that all 11 incidence cases of submucous fibrosis were preceded by blanching on normal mucosa prior to development of fibrous bands. Blanching may be localized or generalized and can occur in various patterns.

Localized blanching (Fig. 7) often appeared as a flat homogeneous area with well defined borders. It can be easily mistaken for homogeneous leukoplakia (particularly so on a photograph) or, for localized loss of normal mucosal pigmentation. In actual clinical examination, there is no raised patch which is the characteristic of leukoplakia. This form of blanching was generally observed on the buccal mucosa.

Reticular form of blanching (Fig. 8) appeared like lace or network with intervening areas of normal mucosa. Sometimes it could be mistaken for reticular form of oral lichen planus but the distinctive characteristic is that the blanching is always flat in contrast to raised striae of oral lichen planus. This form of blanching was often seen on labial and buccal mucosa.

Sieve-like pattern (Fig. 9) was observed on the posterior part of buccal mucosa near retromolar areas and dorsal surface of tongue.

Blanching was also observed in unusual patterns (Fig. 10) that could not be characterized.

5) Petechiae in oral submucous fibrosis

Small raised reddish blue spots in the form of petechiae were observed on oral mucosal surface of submucous fibrosis cases in Ernakulam
quid chewing habit described in this paper have specific clinical characteristics but they do not seem to have been as described as such. One possibility is that they might have been lumped up with other commonly reported lesions like leukoplakia and oral lichen planus. The other possibility is that such lesions are observed only in certain geographic locations because of variations in betel-quid habit.

In chronically heavily addicted betel-quid chewers having betel-chewer’s mucosa, one would normally expect a high probability of leukoplakia to develop over a period. But no progression of this lesion to leukoplakia was observed. Furthermore histologically, this lesion showed hyperplastic epithelium in contrast to atrophic epithelium generally observed in commonly occurring betel-quid associated mucosal lesions like leukoplakia, lichen planus, lichen planus-like lesion and oral submucous fibrosis.

There seem to be some similarity between lichen planus-like lesion reported here and lichenoid mucosal lesions due to use of certain drugs, dental fillings etc\textsuperscript{11}. Clinically both are striated lesions and etiologically, withdrawal of precipitating agent results in resolution of the lesion. The components of betel-quid that may be responsible for the causation of this lesion have not been identified. Apart from Kerala, this lesion was also observed in the state of Goa. Components of betel quid used in Goa and Kerala are similar except for type of tobacco. Perhaps the type of tobacco is not of much significance in causation of this lesion.

Certain common clinical features have been observed among individuals with betel cheilitis and individuals with oral submucous fibrosis, in Kerala. These are pigmentation changes on the vermilion border of lips and atrophy of the tongue papillae. Although there are few studies available on pigmentation changes among smokers\textsuperscript{12, 13}, no such studies have been done among betel-quid chewers.

Localized or generalized blanching of oral mucosa in various forms is an important clinical diagnostic feature of early or latent form of oral
submucous fibrosis. However, it has to be
differentiated from localized loss of normal oral
pigmentation and anaemic mucosa. If this
condition is detected in blanching stage, it’s
progression can be possibly halted by making
affected individual give up the betel-quid habit.

The clinical significance of occurrence of
petechiae in oral submucous fibrosis cases in
Kerala needs to be studied.

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REFERENCES

1. International Agency for Research on
Cancer : IARC Monograph on the
Evaluation of the Carcinogenic Risk of
Chemicals to Humans. Vol. 38. Tobacco

and Precancerous Conditions in Indian
Rural Populations, 1966-69, Munksgaard,
Copenhagen, 1971.

Incidence rates of oral cancer and natural
history of precancerous lesions in a 10-year
follow-up study of Indian villagers.
Community Dent Oral Epidemiol 1980; 8:
287-333.

4. Gupta PC, Mehta FS, Pindborg JJ et al.
Primary prevention trial of oral cancer in

5. Daftary DK, Bhonsle RB, Murti PR, et al.
An oral lichen planus-like lesion in Indian
betel tobacco-chewers. Scand J Dent Res
1980; 88:244-249.

Incidence rate and early forms of oral
submucous fibrosis. Oral Surg 1980; 50 :
40-44.

An oral lesion in tobacco lime users in
Maharashtra, India. J Oral Pathol 1979; 8:
47-52.

Prevalence of oral lichen planus among
7639 Indian villagers in Kerala, South India.
Acta Dermatovener (Stockholm) 1979;
59:255-257.

Focal vascular dilatations and petechiae in
oral submucous fibrosis. Scand J Dent Res
1981; 89:270-274.

Regional variations in oral submucous
fibrosis in India. Community Dent Oral

11. Scully C, El-Kom M: Lichen planus:
review and update on pathogenesis. J Oral

Occurrence and localization in the attached

Melanin depigmentation of palatal mucosa
in reverse smokers: a preliminary study. J

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