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Original Article

Palatal changes in reverse and conventional smokers – A clinical comparative study in South India

T. Ramesh ^{a,*}, R. Sudhakara Reddy ^b, C.H. Sai Kiran ^c, R. Lavanya ^d,
B. Naveen Kumar ^c

^a Professor, Department of Oral Medicine and Radiology, Vishnu Dental College, Bhimavaram, India

^b Professor and H.O.D., Department of Oral Medicine and Radiology, Vishnu Dental College, Bhimavaram, India

^c Senior Lecturer, St. Joseph Dental College, Eluru, India

^d Senior Lecturer, Department of Oral Medicine and Radiology, Vishnu Dental College, Bhimavaram, India

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ABSTRACT

Aim: To evaluate the effect of type of smoking on palatal mucosa in patients attending a dental institution in South India.

Design: A cross-sectional comparative study on palatal changes in conventional and reverse smokers was performed. A total of 150 patients of various age groups were selected from the outpatient department with habit of smoking (reverse and conventional), according to the inclusion and exclusion criteria. The oral findings were properly examined by qualified dentists and findings were noted on a specified Proforma. The palatal changes were graded according to the classification given by Ramulu et al (1972) with few modifications. Fisher's exact test and Mann–Whitney U-test were used to determine any significant differences between the groups. Spearman's rank correlation coefficient test was used to determine any significant association between groups.

Results: Out of 150 patients, 86 males & 64 females participated in the study. A statistically significant female predominance ($n = 63/77$) was observed in reverse smokers when compared conventional smokers ($n = 1/57$). Reverse smokers were observed to have more severe palatal changes than conventional smokers. In reverse smokers, frequency of smoking had a significant effect on palatal mucosa than duration of smoking.

Conclusion: The present study has reported an increased prevalence of reverse smoking in female subjects, which produced deleterious changes in them when compared to conventional smokers. Such habit can be prevented before spreading from one place to another with proper education in the low socioeconomic community thus preventing oral cancer.

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* Corresponding author. Tel.: +91 9440847997 (mobile).

E-mail address: drramesht@gmail.com (T. Ramesh).

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1. Introduction

Reverse smoking is a common social practice in some parts of coastal India. This practice includes smoking of “chutta”, a type of homemade cigar in reverse direction. The habit of reverse smoking which is common in certain parts of coastal India (Andhra Pradesh) is called as “Adda Poga”. This habit mainly presents with placing the fired extreme of cigarette inside the mouth, while the other end is held between teeth and lips. The seal provided by the lips allow slow inhalation of chutta. Air is supplied to the zone of combustion through the non heated extreme of chutta. The smoke is expelled from the mouth and ashes are thrown out or swallowed. The lips keep chutta wet which increases its time of consumption from 2 to 18 min.¹ The word “chutta” is derived from the Tamil word “churutu” which means “to roll or fold”. It is made of dried twigs of home grown tobacco and is rolled crudely in a semi-dried tobacco leaf.²

The clinical manifestations of the oral mucosa in patients with reverse smoking habit were reported to vary from conventional to non-smoking individuals. The most commonly affected areas in reverse smokers are palate and tongue.³ Saunders (1958) described these palatal changes as a papular leukoplakia in the palate, caused by tobacco smoke striking the palate more directly than other regions.⁴ Schwartz (1965) also thought that this type of lesion was caused by tobacco.⁵ Ramulu et al (1973) described the changes in palate due to reverse smoking as nicotina stomatitis, but Gloria J et al (2008) preferred to use the term ‘palatal keratosis associated with reverse smoking’ because, nicotine is not the only etiological factor for intra oral lesions in reverse smokers, instead heat with various other components of tobacco combustion contribute to the development of palatal lesions.⁶

Various studies on the habit of reverse smoking have focused on the prevalence and characterization of clinical and histological changes in the oral mucosa. However, sufficient clinical data comparing the palatal changes in smokers and reverse smokers is not available. Hence a study was undertaken to evaluate the effect of type of smoking on palatal mucosa, in patients attending a dental institution in South India.

2. Methods

A total of 150 patients of various age groups were selected from the outpatient department with habit of smoking

(reverse or conventional smoking). The study was conducted for a period of 6 months. Participants in the study were divided into 2 groups. Group I (reverse smokers) constituted of subjects having reverse smoking habit. Group II (conventional smokers) constituted both conventional chutta and cigarette smokers. Necessary care was taken to include only those smokers who had the habit of smoking from a minimum of 6 months. Lesions that are not associated with habit of smoking were excluded.

After obtaining permission from the Institutional ethical committee subjects were selected according to the inclusion and exclusion criteria. All the subjects with reverse smoking habit were initially counseled and educated regarding the adverse effects of reverse smoking and necessary care was taken to include all the reverse smokers who visited our department during this time period. The study procedure was explained to the subjects in the local language and a written consent was taken. The oral findings were properly examined by the qualified dentists and findings were noted on a specified Proforma. The palatal changes were evaluated in subjects according to the grading system proposed by Ramulu et al.⁶ But the grading system was purely based on premalignant changes in palate, hence few modifications were done and a modified grading system was used, which included – no palatal changes (Grade 0), mild (Grade1), moderate (Grade 2) and severe (Grade 3) form of lesions along with a 5th category, “palatal carcinoma” (Grade 4). Each grade was defined and described in Table 1.

The collected data was entered in a spreadsheet (Excel 2007, Microsoft Office) and analyzed using, statistical analysis software (SPSS version 16.01, SPSS, Inc., Chicago, 1989–2007). Fisher’s exact test and Mann–Whitney U-test were used to determine any significant differences between the groups. Spearman’s rank correlation coefficient test was used to determine any significant association between groups. Significance was set at 0.05 level ($P < 0.05$).

3. Results

The total study sample constituted of 150 subjects (86 males and 64 females). Out of 86 male subjects 72 were conventional smokers (56 conventional chutta smokers, 16 conventional cigarette smokers) and 14 were reverse smokers. In a total of 64 female subjects 63 were reverse smokers and only 1 subject

Table 1 – Description of palatal changes.

<u>Grade 0:</u>	No palatal changes.
<u>Grade 1:</u> Mild palatal changes	Red circular areas over a slightly raised blanched mucosa of the glandular zone of the hard palate (Fig. 1).
<u>Grade 2:</u> Moderate palatal changes	Papules of 2–4 mm with central umbilication less than 2 mm of diameter. Moderate changes include sub-acute to chronic inflammatory mucosal changes associated with hyperkeratinization and premalignant changes like leukoplakia (Fig. 2).
<u>Grade 3:</u> Severe palatal changes	Papules greater than 4–5 mm in size characterized by crater like ulcerations surrounded by keratinization. It is often represented as a burn type of reaction of the palatal mucosa due to the intense heat of the lightened end of chutta, associated with hyperkeratosis. Commonly seen in reverse smokers (Fig. 3).
<u>Grade 4:</u> Palatal carcinoma	Invasive malignant tumor involving palate associated with chronic ulcerations which are confirmed by biopsy (Fig. 4).

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