ORIGINAL ARTICLE

HISTOPATHOLOGICAL ASSESSMENT OF ORAL LEUKOPLAKIA AMONG SNUFF USERS AND NON-USERS

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ABSTRACT

Objectives: To assess histopathological characteristics of oral leukoplakia among snuff users and non-users.

Material and methods: The descriptive cross-sectional study was conducted at different hospitals in Khyber Pakhtunkhwa. The study consisted of 60 cases of oral leukoplakia of which 30 were snuff users and 30 were non-users and histopathological features were assessed in both groups. SPSS 20 was used for the evaluation and analysis of the data.

Results: The observed mean age of the cases was 50.3 years. In snuff users, the mean age was 56.97 (SD+14.71) while in non-users the mean age was 47.43 (SD+13.44). In snuff users, dysplasia 9/30 (30%) was the most common histopathological feature. The relationship between dysplasia in snuff users and non-users was found to be statistically significant with a p-value of 0.04.

Conclusion: It is concluded from the present study that oral leukoplakia showed a wide range of histopathological features and these variants exist even among snuff users however the cases of dysplasia are high in snuff users than non-users which shows a greater potential for conversion of oral leukoplakia into malignancy in snuff users.

Keywords: Oral leukoplakia, Dysplasia, Hyperplasia, Hyperkeratosis

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INTRODUCTION

According to WHO oral leukoplakia (OL) is defined as a" white plaque of questionable risk having excluded other known disorders which carries an increased risk for cancer".[1] Approximately 80% of oral malignancies result from oral precursor lesions.[2] OL is considered one such disorder. The histopathological features are epithelial hyperplasia and surface hyperkeratosis either hyperparakeratosis or hyperorthokeratosis. Epithelial dysplasia may or may not be present and if present it ranges from mild to severe. Epithelial dysplasia is considered a marker of the conversion of a lesion into malignancy.[3-8]

Tobacco use is among one the etiological factors of oral leukoplakia.[9, 10]. Tobacco is used in the Khyber Pakhtunkhwa province of Pakistan specifically in the form of oral snuff (naswar) which is a smokeless (SL) form. 40% of SL tobacco users develop OL in comparison to 1.5% of non-tobacco users.[1] Oral snuff is a mixture of crushed tobacco, powdered lime, ash, indigo, cardamom oil, and menthol.[11-13] The present study is designed to assess histopathological features of Oral leukoplakia to report the probable relation of smokeless tobacco with the development of the said pathological entity in Pakistan research literature. Moreover, one of the features, dysplasia is considered a marker conversion of oral leukoplakia into malignancy so timely treatment and follow-up of dysplastic lesions specifically in snuff users may help to prevent its malignant transformation.

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MATERIALS AND METHODS

This was an analytical cross-sectional study that was performed at Peshawar Medical College and Khyber College of Dentistry, after taking formal permission from the Review Board of the institution from August 2016 to March 2017 and a non-probability convenient sampling technique was adopted. The sample size was calculated by using the Open epi calculator and came out to be 60. These cases of oral leukoplakia were categorized into Group A, which comprised 30 cases of Oral leukoplakia in snuff users and Group B comprised 30 cases in non-users. All the relevant data including the habit of snuff use

or no use and duration of use in years was recorded on a structured proforma. Inclusion criteria for the snuff users and non-users included biopsied and histopathologically diagnosed cases of oral leukoplakia with a history of snuff use and non-use.

Incisional and excisional biopsies of oral leukoplakia were subjected to the standard histopathological procedure, which included grossing of the biopsy sample, and tissue processing followed by Hematoxylin and Eosin staining for slide review. Cases were confirmed by histopathologists. Histopathological features of dysplasia, hyperplasia hyperkeratosis, and a combination of features were found. The analysis of the data was carried out by using Statistical Package for Social Sciences SPSS version 20. The chi-square test was applied for statistical significance, and a p-value of ≤ 0.05 was considered statistically significant.

RESULTS

The observed mean age of the cases was 50.3 years. In snuff users, the mean age was 56.97 (SD$\pm$14.71) while in non-users the mean age was 47.43 (SD$\pm$13.44). All 30 snuff users were males. Among non-users 13/30 (43.3%) were males and 17/30 (56.7%) were females.

Dysplasia was exhibited in 9 (30%) cases and non-users in 6 (20%) (Table 1). The relationship between dysplasia in snuff users and non-users was found to be statistically significant with a p-value of 0.04. The relationship between other features was not found to be statistically significant (Table 2). The results of the combination

Table 1: histopathological features among snuff users and non-users

Histopathological features	Snuff users	Non-snuff users
	N (%)	N (%)
Dysplasia	9(30)	6(20)
Hyperplasia	3(10)	11(36.7)
Hyperkeratosis	5(16.7)	7(23.3)
Dysplasia+ Hyperplasia	4(13.3)	2(6.7)
Hyperplasia + Hyperkeratosis	4(13.3)	4(13.3)
Dysplasia + Hyperkeratosis	4(13.3)	0(0)
Dysplasia + Hyperplasia + Hyperkeratosis	1(3.3)	0(0)
Total	30(100)	30(100)

Table 2: Comparison of histopathological features among snuff users and non-users

Histopathological features	Groups	Cases N (%)	p- value Chi square
Dysplasia	Snuff users	9(30)	0.04
	Non snuff Users	6(20)	
Hyperplasia	Snuff users	3(10)	0.015
	Non snuff users	11(36.7)	
Hyperkeratosis	Snuff users	5(16.7)	0.519
	Non snuff users	7(23.3)	

Table 3: Comparison of combination of histopathological features among snuff users and non-users

Histopathological features	Groups	cases	p- value
Dysplasia+ Hyperplasia	Snuff users	4(13.3%)	0.38
	Non snuff Users	2(6.7%)	
Hyperplasia+ hyperkeratosis	Snuff users	4(13.3%)	1
	Non snuff users	4(13.3%)	
Dysplasia+ hyperkeratosis	Snuff users	4(13.3%)	0.02
	Non snuff users	0(0%)	
Dysplasia+ Hyperplasia+ Hyperkeratosis	Snuff users	1(3.3%)	0.313
	Non Snuff users	0(0%)	

of histopathological features are summarized in Table 3.

DISCUSSION

Prolonged use of snuff changes the morphology of the placement site of the oral mucosa with initial wrinkled appearance and later thinner and more homogenous. This condition is known as oral leukoplakia.[14]

Architectural and cellular features of dysplasia may be the result of mutation of genome of the epithelial cells which ultimately leads to development of OL of the affected area.[7] Dysplastic feature has a high risk of conversion of a lesion of oral leukoplakia into malignancy.[15] In the present study 9 cases of dysplasia were diagnosed in snuff users. This is consistent with an Indian study conducted by Kumar et al., 2012 however in contrast to a study which showed no case of dysplasia in snuff induced oral leukoplakia.[16,17] The difference in the result of the studies conducted globally is probably due to the fact that the composition, manufacturing and application methods of snuff differ from region to region throughout the world.[16-18] Different forms of smokeless tobacco are used worldwide including Toombak in Sudan, Shammah in Saudi Arabia and Yemen, Gutka in India and South East Asia, and many other forms with different constituents however Snuff is mostly used only in Pakistan .[14]

In another study, dysplasia was observed in 60 cases indulged in tobacco smoking and chewing but not snuffs habit.[15] In the present study hyperkeratosis cases were more in non-users as compared to snuff users. Hyperplasia and hyperkeratosis in oral leukoplakia cases reveal a protective response of epithelial cells of the oral mucosa. Snuff and other etiological factors irritate epithelial cells of the mucosa and its permeability to carcinogens of tobacco is increased. Due to irritation, epithelial cells are stimulated and proliferation takes place which results in epithelial hyperplasia. Many studies were conducted globally to correlate hyperkeratosis and oral leukoplakia however no correlation could be found with snuff use.

In our study, there were 5/30 cases of combined histopathological features of dysplasia and hyperkeratosis in OL. This is in accordance with an international study conducted with 6/53 cases but it was not correlated with snuff use.[19]

The limitation of the present study is though smokeless tobacco is globally used however snuff is most commonly used in Pakistan therefore latest international literature regarding OL and snuff use cannot be extensively found in the literature search.

CONCLUSION

It is concluded from the present study that oral leukoplakia shows a wide range of histopathological features and these variants exist even in snuff users. An increased number of cases of dysplasia in snuff users as compared to non-users shows greater risk of malignant transformation in oral leukoplakia among the former group.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Naushin T: Concept and Proofreading

Khan AS: Acquisition and critical review

Ishfaq M: Analysis and interpretation of data

Bashir N: Data collection, Final approval

Iqbal F: Data collection and drafting the work

Hassan MU: Methodology

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.