



## Factors associated with snuff dipper's lesion among snuff users in Peshawar, Pakistan

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### Abstract

Among smokeless tobacco (SLT), snuff is mostly used SLT in Peshawar and associated with Snuff dipper's lesion (SDL). This study was aimed to investigate the association of socio-demographic and other factors with snuff dipper's lesions. This cross-sectional study was carried out in district Peshawar, Pakistan. Total of 224 snuff dippers were included in this study. The sampling technique employed was convenient sampling. Subjects using snuff and having snuff dippers lesions diagnosed by their physicians were only included in this study, while all other types of lesions were excluded. The study was carried through a proforma sheet which intended to know the age, education, type of snuff, history of snuff use, duration of snuff contact with oral mucosa, and grading of the lesion identified by physician. The age range of patients suffered with snuff dipper's lesion was from 15-76 years. The SDL frequency was higher in males as compared to females. Among all the subjects, 92 (37.7%) were educated and 154 (62.3%) were uneducated. The mean value of the history of snuff usage in years was found to be  $12.4 \pm 11.1$ . The most frequent grade of lesion was found to be the grade 1 ( $n=93$ , 38.1%). Mean duration of the snuff contact with oral mucosa was reported to be  $5.87 \pm 2.5$  minutes. The common type of snuff used by patients in this study was loose snuff. This study recommends further prospective studies to include histopathological changes and association of other factors with snuff dipper's lesions.

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## Introduction

Smokeless tobacco (SLT) is one of the commonly used form of tobacco in Pakistan (Bile *et al.*, 2010). It is associated with oral and systemic disorders (Critchley and Unal, 2003; Lee and Hamling, 2009) and specifically oral cancers (Boffetta *et al.*, 2008). According to a recent report conducted in Pakistan it was found that 5.3% of youth, which makes up 4.2 Million population of Pakistan are using smokeless tobacco and 4.7% had used it in past (Khan, 2016). According to this report the children of age 13-15 years are using SLT.

Different types of SLT that are identified so far and using in Pakistan include snuff (naswar), naas, paan, gatka and mainpuri (Nisar and Iqbal, 2011; Riaz *et al.*, 2015). However, the prevalence of snuff use in Pakistan has been reported to be relatively low as compared to other countries of south Asia like India, Bangladesh, Maldives; but higher than Indonesia (Sreeramareddy *et al.*, 2014).

Snuff is cut tobacco which can be used as loose snuff or portioned snuff and is kept in mouth. The quality of snuff varies in pH and lime (Rasool *et al.*, 2013). Studies suggested that around 30 carcinogenic and harmful chemicals have been found in snuff (US Department of Commerce CB, 2007; Secretan *et al.*, 2009). According to a report of Substance Abuse and Mental Health Services Administration (SAMHSA) in 2015, it was stated that in average in year 2014 approximately 1,300 youth under 18 years of age used SLT for the first time (Substance Abuse and Mental Health Services Administration, 2015). It contains nicotine, nitrosamines and other non-combustible carcinogens, lime, bicarbonate, and tobacco, which bring dysplastic changes in the oral mucosa (Andersson and Axell, 1989; Ahmed *et al.*, 2003).

Snuff dipper's lesion (SDL) is a term used for the dysplasia in the oral mucosa due to snuff dip among the snuff users (Rasool *et al.*, 2013) (Fig. 1). The smokeless tobacco causes pouches in the area where the tobacco is usually in contact with the oral mucosa which is then followed by the formation of lesions,

which are also known as snuff Keratosis. It has been observed that although all types of tobacco are related to cause oral lesions, but snuff use is more likely to cause oral lesions (Tomar, 2007). The most commonly affected area is the anterior area of mandibular vestibule. The oral mucosa becomes whitish in color and wrinkle and grainy in texture (Greenberg, 2008). These oral lesions are usually painless and are diagnosed while a routine checkup (Greenberg, 2008; Regezi and Jordan, 2016). Studies suggested that the duration of the exposure of oral mucosa to the tobacco/snuff increases the risk of mucosal irritation and inflammation. The chance of these lesions converting into malignant lesions is four times greater in smokeless tobacco users (Regezi and Jordan, 2016). Winn provided evidence that smokeless tobacco increases the chance of developing oral lesions, oral cancer, peri-odontal diseases, gingivitis, caries and delayed healing however, it was also reported that the withdrawal of SLT can reverse the risk associated with the tobacco use (Winn, 2001).

The mechanism of tobacco use causing these lesions is clear and can be explained as that the use of any form of SLT change the histological features of oral mucosa by changing the surface epithelium. It may cause hyper-pigmentation and thicken the epithelium of oral mucosa. The use of SLT has also been shown to cause irritation of palatine salivary glands (Taybos, 2003; Chitroda *et al.*, 2011). The severity of snuff dippers lesion is most commonly classified into four grades (Hirsch *et al.*, 1982; Mörnstad *et al.*, 1989; Tomar, 2007; Chitroda *et al.*, 2011). The lesion is identified as grade 1 if it is superficial and the oral mucosa is slightly shrunk having white or gray color and there is no hyper-pigmentation or thickness (Tomar, 2007; Chitroda *et al.*, 2011). The lesion is graded as 2 if the color is changed to an obviously white or red one and more shrunk mucosa, but still no thickening while in grade 3 there is thickening and hyper-pigmentation of the mucosa along with the discoloration and grooves. The grade 4 is the most severe clinical form of the lesion with severe deterioration of the oral mucosa (Tomar, 2007; Chitroda *et al.*, 2011). There is very scarce literature

regarding the frequency and associated factors with snuff dipper's lesions in Peshawar, Pakistan as per the author's knowledge. Thus, this study was aimed to find out the association of socio-demographic and other factors with snuff dipper's lesions.

## Materials and methods

### *Samples inclusion and exclusion criteria*

This cross-sectional study was carried out in district Peshawar, Pakistan from May 2017 to January 2018. The total sample size as per Gehan's table was estimated to be 375, however only 224 snuff dippers were involved in this study. The sampling technique employed was convenient sampling. Subjects using snuff and having snuff dippers lesions diagnosed by their physicians were included in this study, while those patients who had oral lesions others than snuff dipper's lesion or any oral cancer were excluded.

### *Sampling method*

The survey was carried through a proforma sheet which intended to know the age, education, type of snuff, history of snuff use, duration of snuff contact with oral mucosa, and grading of the lesion identified by physician. The proforma was well explained to all

patients and an informed consent was taken from the subjects.

### *Statistical analysis*

The data collected was analyzed using IBM-SPSS version 22. For the quantitative data, mean  $\pm$ SD were used. Chi-square test was used to determine the association of the demographic data and the snuff use related data with the severity of snuff dipper's lesion. P value less than 0.05 was considered to be significant.

## Results

### *Age-wise distribution*

The age range of patients suffered with snuff dipper's lesion was from 15-76 years. The age-wise distribution of patients was shown in Fig 2. The mean age of patients suffering from SDL (n=224) was estimated to be  $34.62 \pm 14.2$ .

### *Gender-wise distribution*

The frequency of SDL was higher in males as compared to females as there were 229 (93%) males and 15 (6.1%) females among the 224 subjects (Fig. 3).

**Table 1.** Chi-square Test and Descriptive Statistics for the variables by Grade of the lesion.

| Parameters                                 | Severity of snuff lesion   |     |
|--|----------------------------|-----|
|  | <i>P value</i>             | df  |
| Age  | 0.01                       | 153 |
| Gender                                     | 0.18                       | 3   |
| History of snuff use                       | 0.01                       | 111 |
| Duration of snuff contact with oral mucosa | 0.03                       | 27  |
| Type of snuff                              | 0.01                       | 3   |
| Legend                                     | <i>N= 224, *p &lt; .05</i> |     |

### *Education*

Education based classification of the patients showed that the prevalence was higher in uneducated compared to educated people. Among all the subjects (n=224), 92 (37.7%) were educated and 154 (62.3%) were uneducated (Fig. 4).

### *History of snuff use*

Most of the snuff users having snuff dipper's lesion were using snuff for 1-20 years (Fig. 5). The mean value of the history of usage of snuff in years was found to be  $12.4 \pm 11.1$ .

### *Clinical Grade*

The most frequent grade of lesion for patients with SDL was found to be the grade 1 (n=93, 38.1%)

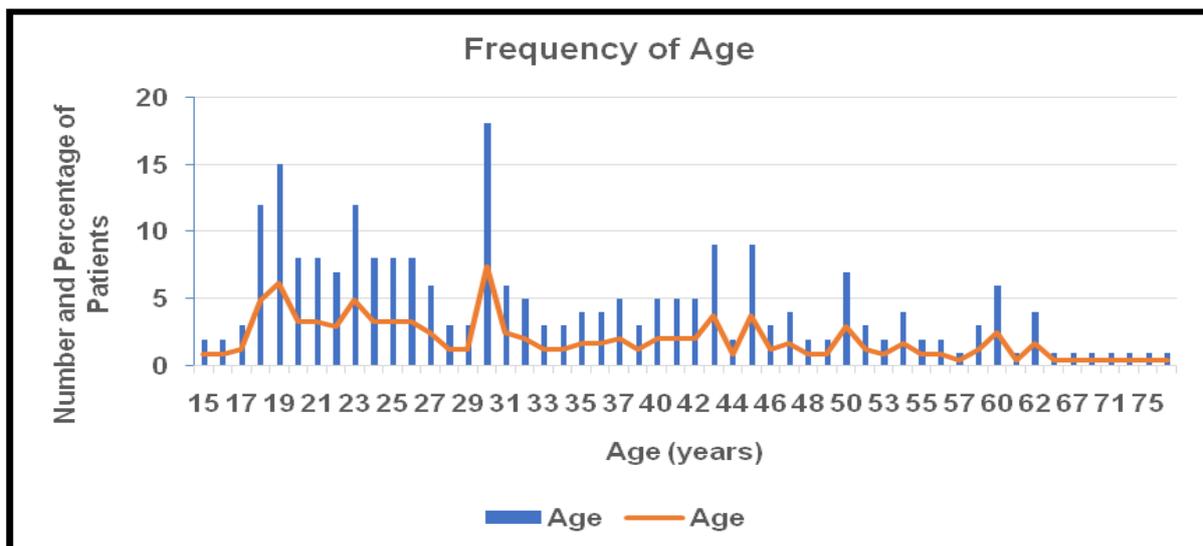
followed by grade 2 (24%) (Fig. 6). The least grade of lesion found was grade 4 (18%).

#### *Duration of snuff contact with oral mucosa*

Duration of the snuff contact with oral mucosa was estimated in minutes (Fig. 7). Mean duration of the snuff contact with oral mucosa was found to be  $5.87 \pm 2.5$  minutes.



**Fig. 1.** A snuff dipper's lesion.



**Fig. 2.** Age-wise distribution of patients suffered with snuff dipper's lesion (n=244).

#### *Type of snuff*

The common type of snuff used by patients in this study was loose snuff; being used by 213 (87.3%) patients, while portioned being used by 31 (12.7%) (Fig. 8).

#### *Analytical statistics*

Chi square test was used for the association between the grade of snuff dippers' lesion and age, gender,

history of snuff use, duration of snuff contact with oral mucosa and type of snuff. The results of the chi square analysis are summarized in the Table 1. The chi-square test analysis shows statistically significant association when age, history of snuff use (in years), duration of snuff contact with oral mucosa (in minutes), type of snuff use was cross-tabulated with severity of snuff lesion (grading) except gender (Table 1).

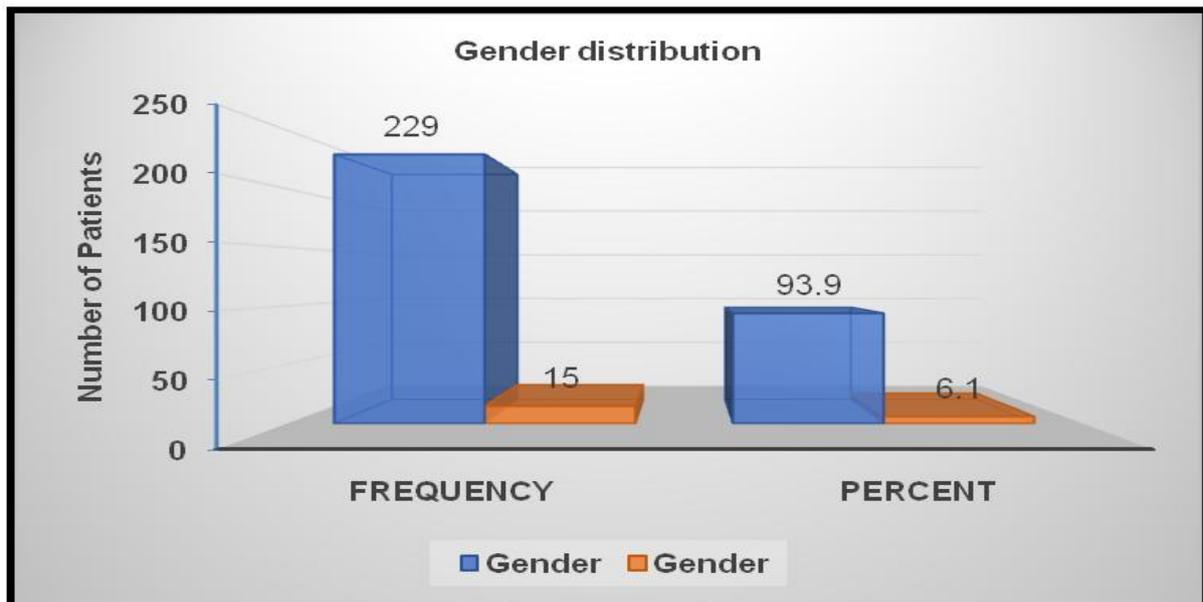


Fig. 3. Gender-wise distribution of patients with snuff dipper's lesion (n=224).

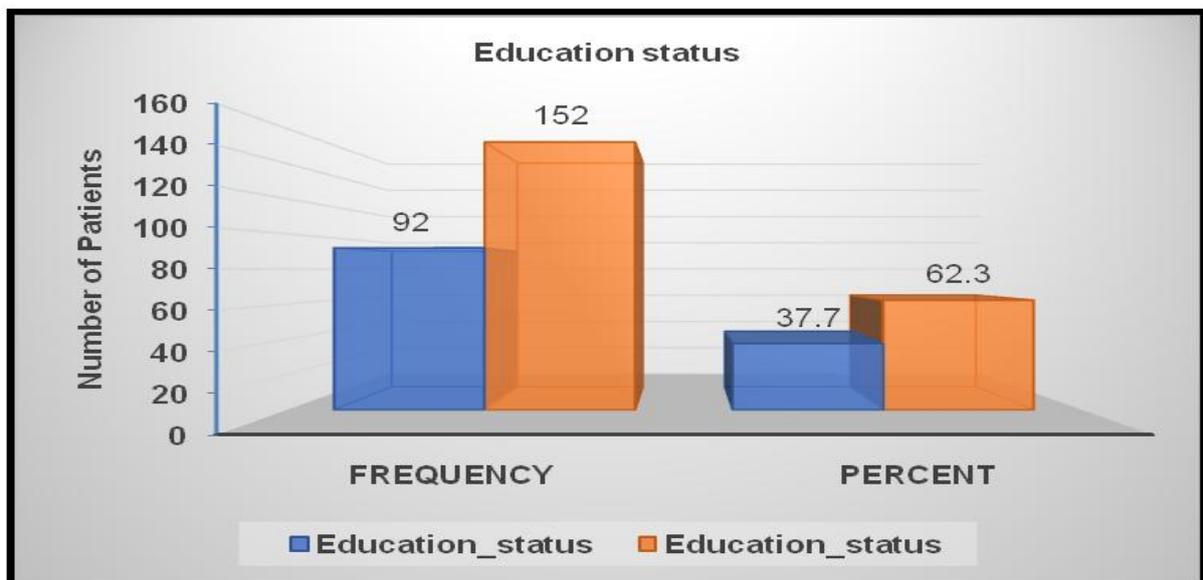


Fig. 4. Education status of patients suffered with snuff dipper's lesion (224).

### Discussion

In the present study, 224 subjects diagnosed with snuff dipper's lesion by physician were included. The data analysis indicated that most of the patients having snuff dipper's lesion were adults having a mean age value of  $34.62 \pm 14.2$ . This is consistent with the findings of Lesan *et al.* (2014) and Wray and Guirt, (1993) as they also concluded middle aged snuff users to be more affected with SDL. However, the study contrasts with the finding of other studies (Wallström *et al.*, 2011; Reddy *et al.*, 2015). The differences can be due to the different cultural and

demographical factors. As in Pakistan, specifically in Khyberpukhtoon Khwa (KPK) province, the use of snuff is very common even among young population.

In present study the snuff dipper's lesion were seen to be more frequent among males as compared to females. This is could be due to the reason as identified by studies that Snuff use is more common among males as compared to females (Wolfe and Carlos, 1987; Kaugars *et al.*, 1989). Moreover, most of the females deny the use of any form of tobacco as it is associated with stigma and is still a taboo in Pakistan.

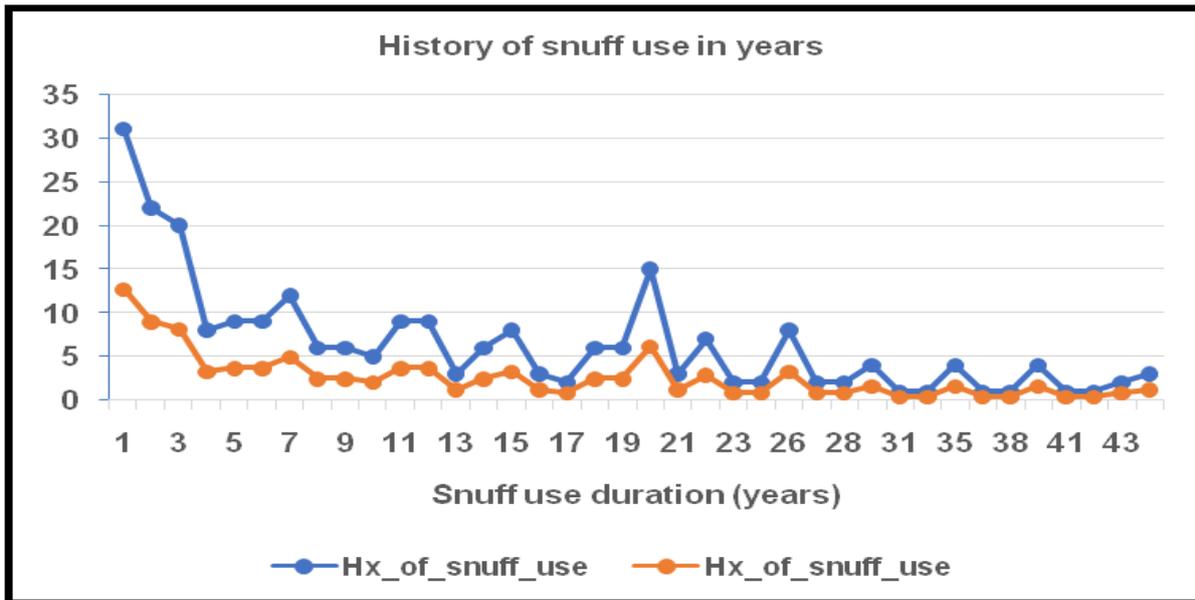


Fig. 5. History of snuff use by patients suffered with snuff dipper’s lesion (n=224).

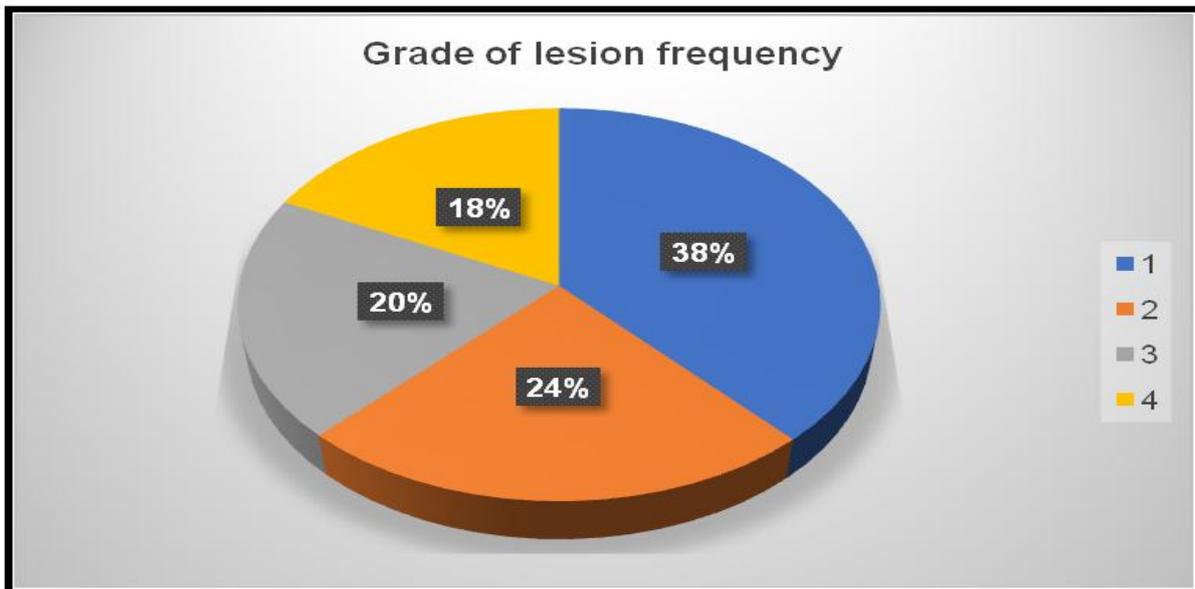


Fig. 6. Frequency of Grades of lesion in patients suffered with snuff dipper’s lesion (n=224).

Most of the patients with snuff dipper’s lesion presented in this study were uneducated and the most common type of snuff used was loose snuff and was found to be associated with severity of the lesion. As loose snuff is perceived to be easily absorbed in oral mucosa and pure form of tobacco, it is widely used as compared to the portioned snuff. It is also cheaper and easily available than the portioned snuff. The present study found an association of history of snuff use (in years), duration of snuff contact with oral mucosa (in minutes) and type of snuff with the severity of the snuff lesion. The most common degree

of the lesion among these subjects (n=224) was degree 1.

These findings are in accordance with the results of other studies (Hirsch *et al.*, 1982; Mörnstad *et al.*, 1989; Andersson *et al.*, 1991; Ayo-Yusuf *et al.*, 2000; Wallström *et al.*, 2011; Lesan *et al.*, 2014; Singh *et al.*, 2014). This association is explainable as the chronic use of tobacco having harmful substances will increase the risk of severity of the lesions and loose snuff is in direct contact with the mucosa therefore it is also associated with the severity of SDL.

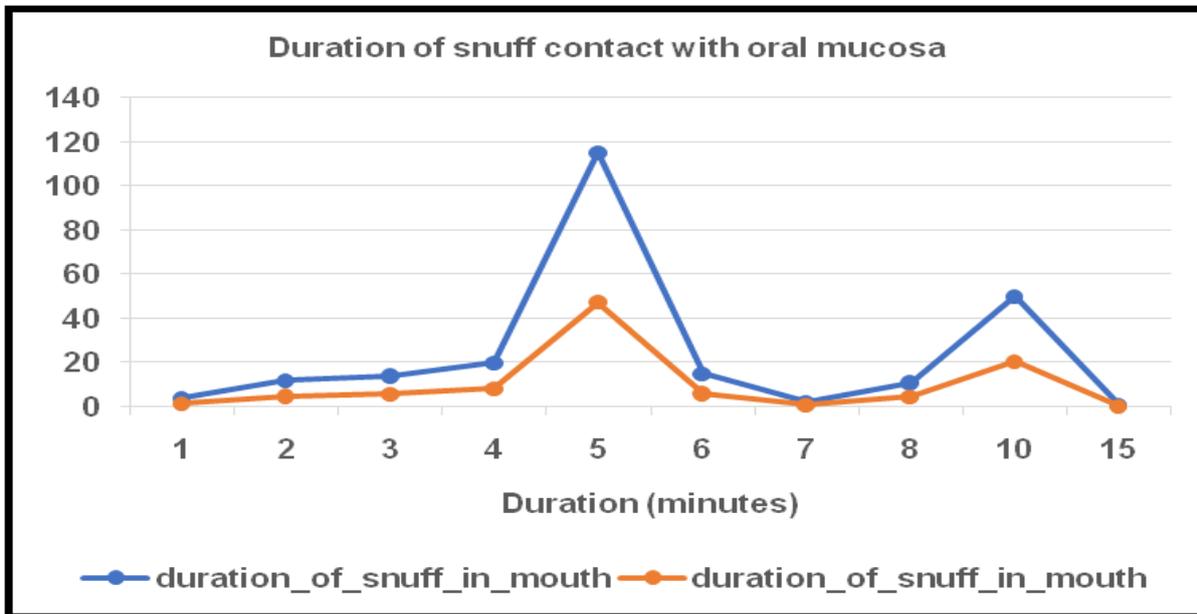


Fig. 7. Duration of snuff contact with oral mucosa in patients with snuff dipper’s lesion (n=224).

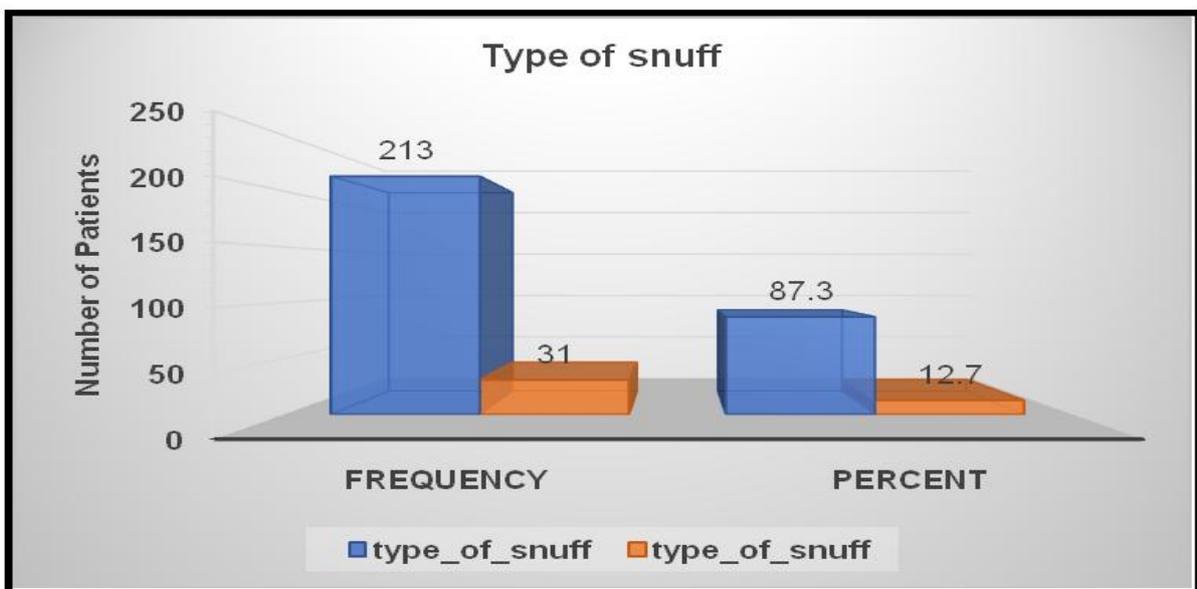


Fig. 8. Frequency of types of snuff being used by patients with snuff dipper’s lesion (n=224).

**Conclusion**

This study concludes that the age, history of snuff use, type of snuff and duration of snuff contact with oral mucosa has an association with the severity of the snuff dipper’s lesion.

It also recommends further prospective studies to include histopathological changes and association of other factors with snuff dipper’s lesions. Moreover, it is recommended that awareness shall be created among the general population about snuff use and Snuff induced lesions as most of the people perceive it

less harmful or even harmless as compared to smoking tobacco.

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*Conflicts of interest*

The authors have no conflict of interest concerning the cases in this paper.

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