



Reactive lesions of the oral cavity - A retrospective study

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ABSTRACT

Reactive lesions are tumor-like growth and are non-neoplastic in nature. The external and internal stimuli give rise to reactive lesions. The aim of the study is to determine the prevalence and of the oral reactive lesions in an institutional setup. This is a single center cross-sectional retrospective study where records of patients with reactive lesions were collected from 86000 patients visiting Saveetha Dental College during the time period of June 2019 to March 2020. Descriptive statistical methods were used and recorded on data forms. The data were analyzed using SPSS, chi-square tests. 225 patients were identified with reactive lesions. 81(36.2%) patients had tobacco pouch Keratosis, followed by 59 (26.3%) patients with Keratosis. 144 (64%) patients were not wearing or using any prosthesis. However, 44 (19.6%) patients were using temporary partial dentures and 22 (9.8%) patients were using complete dentures. Of all the cases examined, 168 (74.7%) were male 57(25.3%) were female. The most commonly affected anatomical site was the gingiva with 64 (28.4%) patients. A total of 155(68.9%) patients had poor oral hygiene Tobacco pouch keratosis is the most commonly affected lesion. Attention to policies about controlling and preventing tobacco and the risk of malignant transformation must be stressed. Early detection and treatment of reactive lesions by dentists can reduce dentoalveolar complications.



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INTRODUCTION

The oral cavity is always under the influence of various stimuli, showing a range of developmental dis-

orders, irritation, inflammation, and lesions (Effiom *et al.*, 2011; Naderi *et al.*, 2012). Reactive lesions (RLs) are clinicopathological benign, reactive, solitary, swelling occurring due to chronic and recurrent tissue injury leading to extreme or exuberant tissue response (Reddy *et al.*, 2012; Jayaraj *et al.*, 2015b). They are commonly evident in the gingiva, and sometimes, other sites are involved. RLs are typically developed in response to chronic inflammation caused by various forms of low-grade chronic irritations to the oral mucosa (Jayaraj *et al.*, 2015a; Sridharan *et al.*, 2019). Even though the lesion is benign, it has a tendency of recurrence with incomplete excision and inability to remove local irritants (Amirchaghmaghi, 2011; Seyedmajid *et al.*, 2011).

The reactive lesions of the oral cavity are non-neoplastic proliferation with a very similar appearance to benign neoplastic proliferations (Hashemipour *et al.*, 2008; Al-Khateeb, 2009). The proliferations are painless pedunculated or sessile masses in various colors from light pink to red or white (Buchner *et al.*, 2010; Omidian, 1994).

Irritation fibroma, pyogenic granuloma, denture stomatitis, Keratosis, angular cheilitis, necrotizing sialometaplasia, angiomatous granuloma, mucocele, inflammatory fibroepithelial hyperplasia, peripheral ossifying fibroma, tobacco pouch keratosis are most of the reactive lesions of the oral cavity (Shamim *et al.*, 2008; Ababneh, 2006; Mashhadi, 2008). They are commonly present in gingiva and their occurrence in other places of the oral cavity such as the tongue, Palate, cheek, and floor of the mouth is not commonly seen.

Early identification and treatment of these oral reactive lesions by dentists can lessen the complications in the future (Seifi and Nosrati, 2010; Aghbali *et al.*, 2016). Knowledge about the frequency of such reactive lesions can help assist dentists in making a better diagnosis and offering appropriate treatment (Zhang *et al.*, 1985). Studies on the current prevalence rates, clinical appearance, etiology and behaviour of these lesions are very limited. Hence the present study was designed to retrospectively determine the relative prevalence of the oral reactive lesions in an institutional setup. This would help in understanding the clinical characteristics and the current prevalence of reactive lesions.

MATERIALS AND METHODS

The study was conducted as a retrospective study in hospital settings with a varied population, predominantly South Indian. Case records of patients visiting the dental hospital were retrieved from 86000 patients visiting Saveetha Dental College in the time period of June 2019 to March 2020. Clinically and histopathological confirmed cases of reactive lesions of the oral cavity were included for the study. The study has IRB (Institutional Review Board) approval.

All relevant Clinical Information like age, gender, and the anatomical location, clinical presentation and diagnosis of the lesions were collected for each patient. The presence or absence of an intra-oral Prosthesis was collected. The site of the lesion was classified into gingiva, alveolar ridge, Palate, labial mucosa, buccal mucosa, and vestibular region.

The data was collected into an excel sheet and

tabulated. It was then analyzed using SPSS software version 25, using descriptive statistical methods (means, standard deviations, and percentages). Between group comparisons of proportions were done using chi-square tests. $p < 0.05$ was considered as statistically significant.

RESULTS AND DISCUSSION

Table 1: Frequency of reactive lesions in different age groups

	Frequency	Percentage
10-30 years of age	52	23.1
30-50 years of age	95	42.2
50-80 years of age	76	33.8
Total	223	100

Table 2: Percentage of dental prosthesis usage among patients

	Frequency	Percentage
Complete denture	22	9.8%
Temporary partial denture	44	19.6%
Removable partial denture	1	0.4%
Fixed partial denture	11	4.9%
Absent	144	64%
Total	225	100

Table 3: Frequency of different clinical appearance of reactive lesions

	Frequency	Percentage
Normal colours	157	74.2
Inflamed erythematous	58	25.8
Total	225	100

Of all the cases examined, 168 (74.7%) were male, 57 (25.3%) were female. Males were more affected than females. Overall, males were more affected by oral reactive lesions than females. The results show that tobacco pouch keratosis is more commonly prevalent in males than females [Table 1]. This could be due to the high prevalence of tobacco associated habits among males than females (Gupta and Ramani, 2016).

Of these patients, 144 (64%) patients were not wearing or using any prosthesis [Table 2]. However, 44 (19.6%) patients were using temporary partial

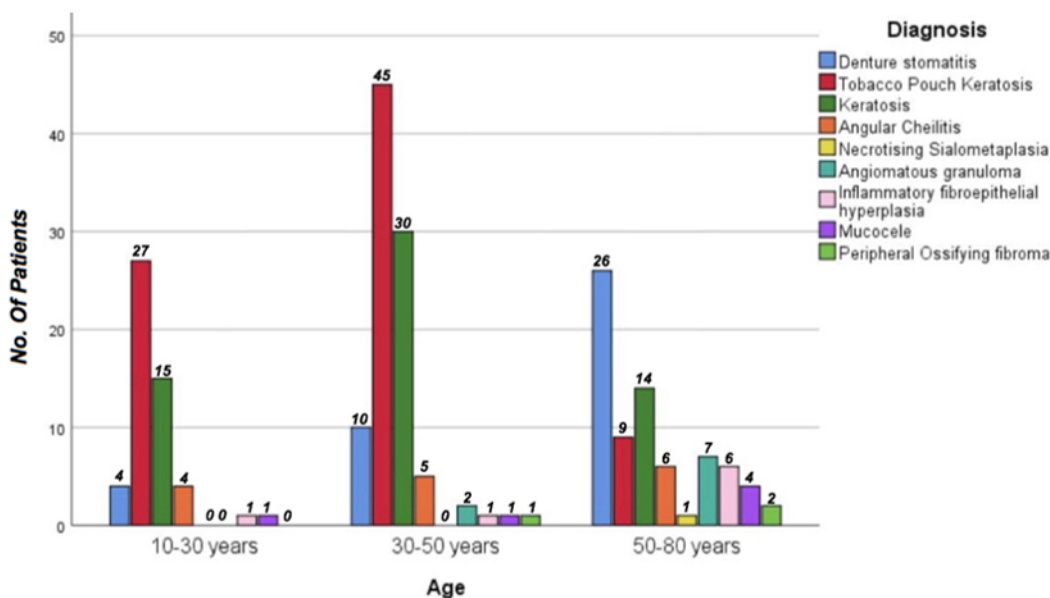


Figure 1: Comparison between age and oral lesions

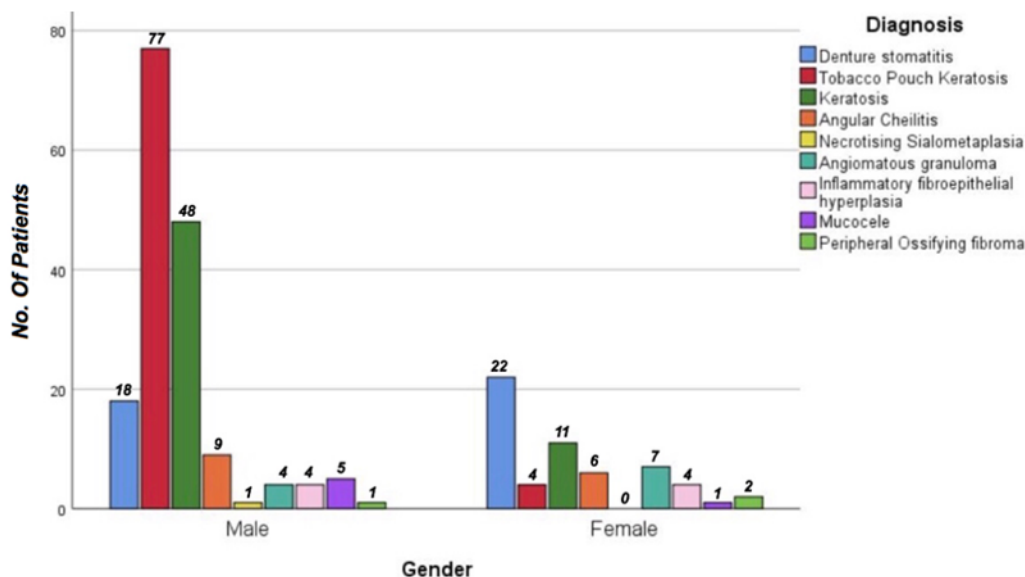


Figure 2: Comparison between gender and oral lesion diagnosis

Table 4: Frequency of different sites of occurrence in reactive lesions

	Frequency	Percentage
Gingiva	64	28.4
Alveolar ridge	34	15.1
Palate	32	14.2
Labial mucosa	36	16.0
Buccal mucosa	41	18.2
Vestibular region	18	8.0
Total	225	100.0

Table 5: Frequency of oral hygiene among patients with reactive lesions

	Frequency	Percentage
Good	70	31.1
Poor	155	68.9
Total	225	100.0

dentures and 22 (9.8%) patients were using complete dentures [Table 3]. In the present study, the considerable frequency of ill fitting and worn out dentures could be the reason for the occurrence of dental prosthesis related reactive lesions like denture stomatitis and angular cheilitis. The mucosa

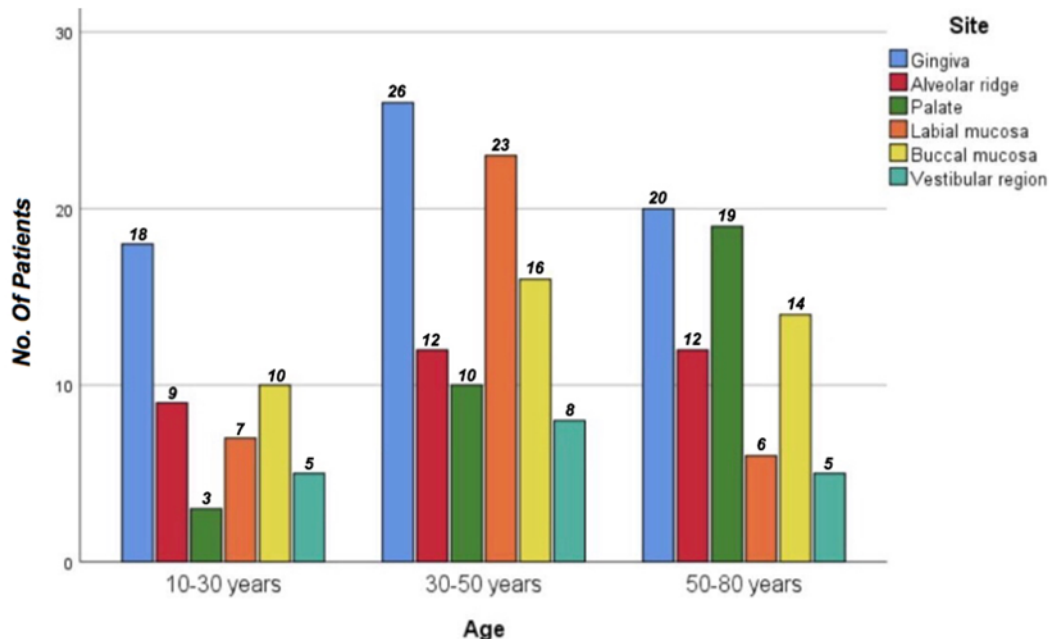


Figure 3: Comparison between age and various sites of lesion occurrence

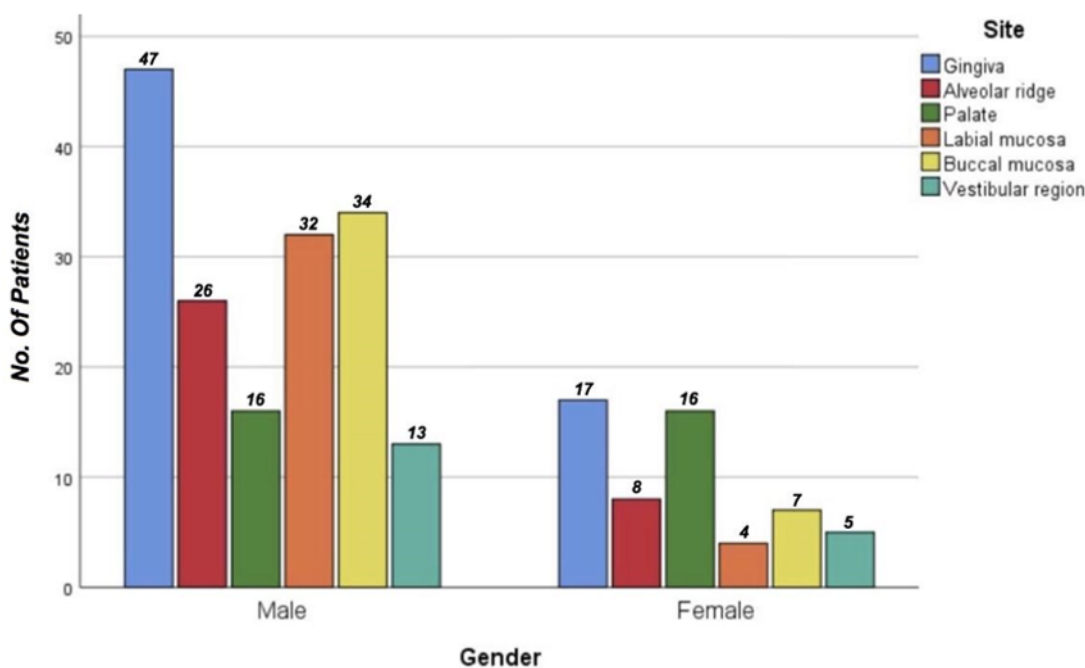


Figure 4: Comparison between gender and various sites of lesion occurrence

of the affected lesions was normal in 167 (74.2%) patients while 58 (25.8%) [Table 4] patients had inflamed erythematous lesions and was attributed to the increase in engorged blood vessels surrounded by SMA positive smooth muscle cells and inflammation (Jayaraj et al., 2015b).

The oral hygiene status of these patients was also recorded and 68.9% of patients had poor oral hygiene, and 31.1% of patients had good oral hygiene [Table 5]. Reactive gingival hyperplastic lesions occur primarily because of local irritations

such as accumulation of dental plaque and calculus, leading to poor oral hygiene.

The most common reactive lesion was tobacco pouch keratosis (36.2%); followed by hyperkeratosis in (26.3%) cases. 17.9% had denture stomatitis; 6.7% had angular cheilitis. The other lesions are summarised in [Table 6]. The results obtained from the present study shows that the majority of the patients were affected by tobacco pouch keratosis. It was followed by Keratosis, which was the second most affected lesion according to the study.

Table 6: Frequency of various diagnosis of reactive lesions

	Frequency	Percentage
Tobacco pouch keratosis	81	36.0
Keratosis	59	26.2
Denture stomatitis	40	17.8
Angular Cheilitis	15	6.7
Angiomatous granu- loma	11	4.9
Inflammatory fibroep- ithelial hyperplasia	8	3.6
Mucocele	6	2.7
Peripheral Ossifying fibroma	3	1.3
Necrotising Sialometaplasia	1	0.4
Total	225	100

Tobacco pouch keratosis was more prominent in males of 30-50 years of age, followed by Keratosis and 10-30 years of age group were the least affected. From, [Figure 1] X-axis represents the age and Y-axis represents the patient count. Blue denotes denture stomatitis, red denotes Tobacco pouch keratosis, green denotes Keratosis, orange denotes Angular cheilitis, yellow denotes Necrotising sialometaplasia, Turquoise denotes Angiomatous granuloma, Pink denotes Inflammatory fibroepithelial hyperplasia, purple denotes Mucocele and Light green denotes Peripheral ossifying fibroma. Tobacco pouch keratosis being more prevalent in 30-50 years of age than 10-30 yrs and 50-80 yrs, which is statistically significant. ($p < 0.05$). (Chi-square value-60.67 p value - 0.000)

From [Figure 2], X-axis represents the gender type and Y-axis represents the patient count. Blue denotes denture stomatitis, red denotes Tobacco pouch keratosis, green denotes Keratosis, orange denotes Angular cheilitis, yellow denotes Necrotising sialometaplasia, Turquoise denotes Angiomatous granuloma, Pink denotes Inflammatory fibroepithelial hyperplasia, purple denotes Mucocele & Light green denotes Peripheral ossifying fibroma. Tobacco pouch keratosis was more prevalent in males compared to females, which is statistically significant. ($p < 0.05$). (Chi-square value-60.67 p value - 0.000). This could be due to the associated tobacco habits in India when compared to those lesions reported from other countries. Since India is a country with huge consumption of tobacco and tobacco-related products,

many people are exposed to tobacco products over a period of time (Rohini and Rao, 2001). Tobacco poses a potential threat to the oral cavity as they are in direct contact with the mucosal surface leading to a high prevalence of tobacco pouch keratosis.

The present study shows that 17.9% of cases with denture stomatitis. Prevalence of denture wearers was reported considerably in this study, hence poorly maintained dentures with plaque accumulation and fungal colonisation along with the use of dentures even during sleep may be a major cause of denture stomatitis (Nikawa et al., 1998).

In the present study, 4.9% of patients presented with angiomatous granuloma. Angiomatous granuloma is common in females and has a striking predilection for the gingiva. It has a female predilection as the marked increase in the levels of estrogen and progesterone in pregnancy modulates the endothelium of the vessels producing angiomatous granuloma (Shamim et al., 2008). Hormonal imbalance has been believed to be responsible for the growth of gingival hyper-reactive inflammatory lesions (Park et al., 2017).

Mucocele is common in young individuals due to trauma and commonly seen in lower lips. In our study, most of the population were middle aged. Hence mucocele and other reactive lesions were less commonly seen compared to the older population in the present study (Jangid et al., 2015; Swathy et al., 2015).

In the present study, we found that gingiva is more prone to reactive lesions (28.4%). Most of the reactive lesions commonly affect gingiva, indicating that reactive lesions originate from the periodontal ligament and connective tissue and are supported by different studies (Effiom et al., 2011; Kadeh et al., 2015). Other common sites were Palate. Alveolar mucosa, labial and buccal mucosa, vestibules. Denture stomatitis affects the palate region and could be related to fitting dentures.

The obtained results were compared using the Chi Square test. Age and diagnosis are compared and the p value obtained is statistically significant ($p < 0.05$). Gender and diagnosis are compared and the p value obtained is statistically significant ($p < 0.05$).

Gingiva was the most common site in the age group 30-50 years of age, followed by the Labial mucosa and males show a higher incidence of reactive lesions confined to the gingiva. From [Figure 3], X-axis represents the age and Y-axis represents the patient count. Blue denotes Gingiva Lesion, Red denotes Alveolar ridge, green denotes Palate,

orange denotes Labial mucosa, yellow denotes buccal mucosa & Turquoise denotes Vestibular region. The occurrence of reactive lesions was more common in the Gingiva, which is statistically significant ($p < 0.05$). (Chi-square value-18.824, p value - 0.043).

From [Figure 4], X-axis represents the gender and Y-axis represents the patient count. Blue denotes Gingiva Lesion, Red denotes Alveolar ridge, green denotes Palate, orange denotes Labial mucosa, yellow denotes buccal mucosa & Turquoise denotes Vestibular region. Gingiva being more prevalent for lesions in males than compared to females (Chi-square value- 15.788, p value - 0.007).

Saliva helps with a complex balance among local and systemic sources. This allows for the application of saliva in the diagnosis for oral diseases and reactive lesions (Sivaramakrishnan and Ramani, 2015; Shree et al., 2019). The presence of different types of giant cells depends on the lesions in which they are present. Immunohistochemistry can be used for a better understanding of the origin of the lesions (Sherlin et al., 2015; Gheena and Ezhilarasan, 2019).

Serum metabolic is also helpful in the diagnosis of reactive lesions of the oral cavity (Sridharan et al., 2017). Microarrays which is a well-known tool is used to understand the complex interactions and networks in the development of several diseases. This can also be used to determine the diagnosis of oral reactive lesions (Thangaraj et al., 2016).

There should always be close monitoring of oral cavity lesions to assess the progression and regression over time (Viveka et al., 2016). The main purpose of photography in dentistry is the registration of clinical information in the oral cavity. Taking images of the progression of the lesions can help in aiding of the diagnosis (Hannah et al., 2018).

Enhancing the knowledge on current prevalent rates and clinical characteristics sharpens the clinical acumen in early diagnosis and assessment of the progression and regressions of reactive lesions. Early detection and treatment of reactive lesions by dentists can reduce dentoalveolar complications. The limitations of the study include short single centered cross-sectional study; hence, the results are limited to the institution. Multicentric studies on a large number of patients with extensive analysis of the etiological factors would be largely helpful in arriving at a solid conclusion regarding the clinical characteristics of oral reactive lesions.

CONCLUSIONS

In summary, in this study, tobacco pouch keratosis was the most common lesion. The reactive lesions were more common in males and in age groups of 30-50 years. If people are made to believe that tobacco consumption can adversely affect their oral health, it can lower the probability of tobacco pouch keratosis. Attention to policies about controlling and preventing tobacco in educational institutions, health care facilities, public transportation, and banning tobacco commercial advertisements must be stressed.

The results of our study are important in devising programs to improve oral health knowledge among commoners. This can have a ripple effect, as dentists who practice good oral hygiene personally would be able to counsel and teach their patients on improving their oral hygiene more effectively.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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