

Demographic and Morphological Evaluation of Tumor and Tumor like Lesions of Oral Cavity: A Tertiary Care Hospital Based Study with a Brief Review

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Abstract

Title: - Demographic and morphological evaluation of tumor and tumor like lesions of Oral cavity- A tertiary care hospital based study with a brief review. **Context:** - **Oral:** cavity is subjected to broad spectrum of agents leading to varied changes that can become the cause of suspicion of cancer and anxiety. **Aim:** To evaluate the clinico-pathological profile of tumor and tumor like lesions that can occur in oral cavity. **Setting and design:** Cross sectional study in Pathology department of a tertiary care hospital. **Material and methods:** - Morphological and clinical evaluation of all the biopsies and surgically resected specimens, was conducted over a period of two years. SPSS-15 software was used to calculate the statistical significance of associations. **Observations:** - Eight percent of all the tumours and tumour like lesions, occurred in oral cavity. Male preponderance was noted (64.4%), with average age of males and females being 44.9 years and 46.2 years respectively. Buccal mucosa was the most common site (37.1%). Malignant tumours formed the largest group (59.4%), 14.7% were benign, 11.9% premalignant and 14% were tumour like lesions. Most common malignant lesion was squamous cell carcinoma (SCC). All the cases of oral SCC had history of tobacco consumption (p value=0.000). **Conclusion:** - Amongst all tumour and tumour like lesions of oral cavity, OSCC occurred predominantly. Histopathology played a crucial role in determining the exact nature of oral cavity lesion. As oral cancers are known to spread rapidly, cost-effective oral cancer screening and awareness initiatives should be introduced urgently and intensively in high-risk

populations of India.

Keywords:- Oral cavity; Oral cancer; Tumour like lesions; Tumours

Introduction

Oral cavity is subjected to broad spectrum of agents leading to changes in oral mucosa. These include infections from bacteria, fungi, viruses, parasites, physical, and thermal influences, changes in immune system, systemic diseases, trauma, various addictions like tobacco, betel nut, paan, gutkha, or alcohol consumption, and ageing. The changes inflicted by these varied agents in oral mucosa may range from a white patch, a plaque, an ulcer or a growth. These changes can be the cause of anxiety in an individual as they raise the suspicion of cancer. Here histopathology plays an important role to differentiate them. Therefore, the chief aim of present study was to evaluate the clinico-pathological profile of tumor and tumor like lesions that can occur in oral cavity.

Material and Methods

The present cross-sectional study was conducted in a 1400 bedded tertiary care hospital. This hospital caters to the health problems of lower and middle income group population from the area in near vicinity as well as patients referred from nearby suburbs.

To minimise misclassification errors and for the purpose of evaluation, the extent of oral cavity was

defined according to American Joint Committee on Cancer Staging [1]. The oral cavity extends from the skin- vermilion junction of the lips to the junction of the hard and soft palate above and to the line of the circumvallate papillae of the tongue below. Thus, the lesions arising from lips, buccal mucosa, upper and lower alveolar ridge, retromolar trigone, floor of the mouth, hard palate and anterior two third of tongue were included in the present study.

All the biopsies and surgically resected specimens, received in department of pathology, were reviewed over a period of two years. They were subjected to routine tissue processing in automatic tissue processor, 4-5 microns section cutting and routine H& E staining. Histopathology was evaluated. The detailed clinical data viz. age, sex, site within oral cavity was recorded.

All the tumours were classified according to WHO classification of Head and Neck tumours. [2]

Tumor like lesions were evaluated on the basis of features described by various authors in the literature. [3, 4, 5, 6]

SPSS-15 software was used to calculate the statistical significance of associations.

Observations

Total number of specimens of tumors and tumor like lesions received over a period of two years were 1911, of which, 152(8%) occurred in oral cavity.

Nine cases were excluded from the study as biopsy was superficial and no conclusive diagnosis could be made.

There were 92 (64.4%) males and 51 (35.6%) females. Patients were in the age range 8years – 80 years with average age of males and females being 44.9 years and 46.2 years respectively. Buccal mucosa was the most common site (37.1%) for lesions of oral cavity followed by tongue (26.6%) in both males and females. Lip and gingiva & alveolus were involved in 15.4 % and 11.2% cases respectively. Less commonly the lesions were seen in retromolar trigone, floor of the mouth and hard palate (4.9%, 5.2%, and 0.7% respectively).

Malignant tumors formed the largest group comprising of 59.4% (85) cases, 14.7% (21) were benign, and 11.9% (17) premalignant and 14% (20) were tumor like lesions. A site wise and behaviour wise distribution of all tumor and tumor like lesions of oral cavity is shown in Table 1.

Growth Patterns

Behaviour wise distribution of growth patterns is shown in Table 2. Growth patterns noted in this study were plaque, ulcer, and cyst and exophytic proliferative growth. Majority of the oral cavity lesions irrespective of nature, presented as exophytic proliferative growth (83.9%). Next common presentation of malignant lesions was ulcer (20%), which was not observed with benign lesions. Though, cystic lesions were mostly benign but occasional cyst (1.2%) harboured malignancy. Histopathology played an important role to determine the accurate diagnosis of lesions. [Fig. 1(a,b,c,d)], [Fig.2(a,b,c)]

Malignant Tumors

Distribution of malignant tumors in oral cavity is shown in figure 3. Squamous cell carcinoma (SCC) was the most common malignant tumor (82, 95% cases) reported in oral cavity. Of 82 cases of SCC, 80 were conventional keratinizing SCC, 1 non keratinizing SCC and 1 verrucous carcinoma. Broder's grade II SCC was most common among conventional SCC. Both males and females had maximum number of cases (60%) in 41-60 years age group. Age ranged from 20-80 years, with mean age of 52.5 years.

Though, overall occurrence of SCC was only 6% higher in males (31.5%) than females (25.9%), but ratio of occurrence of SCC and benign tumors and tumor like lesions was 1.85:1 in females as compared to 0.95:1 in males. (p value = 0.065)

Site wise distribution of oral SCC (Table 3) showed that overall, buccal mucosa was the most common site of origin of SCC (34.1% cases) followed by tongue (31.7%). In females SCC was reported predominantly in buccal mucosa (51.5% cases) while tongue was the most common site in males (31.9%). Gingivo buccal sulcus constituted third commonest site for the occurrence of oral SCC in 13.4% patients with slight predilection in males.

All the cases of oral SCC had history of tobacco consumption (p value=0.000)

Premalignant Lesions

Leukoplakia was the most common premalignant lesion encountered (13/17, 76.5%). Two cases had

verrucous hyperplasia; one case each had proliferative verrucous leucoplakia and carcinoma in situ. Male to female ratio was 7.5:1 and age ranged from 20-60 years, with average age of 47.9 years. The most common site for leukoplakia was buccal mucosa (8/17). History of tobacco consumption was available in only 10 cases, of which nine had positive history.

Benign Tumors

Haemangioma was the most common benign tumor (47.6%) followed by Papilloma (23.8%) and Neurofibroma (14.3%). One case each of AV malformation, Schwannoma and atypical Lipoma was reported. Male to female ratio was 2:1. The age range was 9-60 years, with average age of 30 years.

Tumor like Lesions

Most common tumor like lesion was Granuloma pyogenicum (6/20 cases) followed by mucocele (5/20 cases) and fibroepithelial polyp (4/20 cases). Other cases included irritation fibroma (3), ranula (1) and pseudoepitheliomatous hyperplasia (1). Male to female ratio was 2.3: 1. The age ranged from 9-64 years, with average age of 33 years.

Discussion

Incidence and behaviour of oral cavity lesions:

Eight percent of all the tumors and tumor like lesions that were detected in the present study population, occurred in oral cavity. Ravi mehrotra et al [7], Saraswathi TR et al [8] and Kiran G. et al [9] reported oral cavity lesions in 1.9%, 4.1% and 5% cases of the study population from Allahabad, Chennai and Hyderabad respectively. Akin to study of Ravi Mehrotra et al [7] behaviour wise distribution of oral cavity lesions in present study revealed a similar pattern i.e. malignant lesions being more common (59.4% and 39.9% respectively) followed by benign tumours and tumour like lesions (27% and 35.2%) and premalignant lesions (12% and 16.7%). However, ratio of malignant to benign tumours was comparatively high in the present study, than Allahabad study [7] (4:1 vs. 1.1:1). In the Hyderabad study [9] benign lesions were more common (58.6%)

followed by malignant (29.1%) and potentially malignant (12.2%). The variation in incidence and pattern of the disease can be attributed to the combined effect of duration of study, ageing of the population as well as, regional differences in the prevalence of disease-specific risk factors like habits of smoking, chewing tobacco, sanitary conditions, infections, oral hygiene, literacy etc in a specific population.

Malignant Lesions

“Oral cancer” encompasses all malignancies originating in the oral cavity. Oral cancer ranks sixth in the overall incidence for the ten most common cancer sites worldwide and third in the developing countries [10, 11]. There is also a marked disparity in geographic incidence between the “high” and “low” prevalence areas of the world, suggesting major geographic differences in risk factors. India has always been cited as the country with the highest incidence in the world. According to Cancer Incidence, in V Continents – vol. VIII (a recognised reference source on the incidence of cancer in populations around the world), one district of India (Bhopal) has the highest AAR (age adjusted incidence rate) for cancers of both the tongue (10.9 per 100,000) and mouth (9.6 per 100,000) in the world. The other urban cancer registries of India have AARs between 3.4 and 6.0. [12]

In comparison with the U.S. population, where oral cavity cancer represents only about 3% of malignancies, it accounts for over 30% of all cancers in India. [11]

More than 90% of oral cancers are classified histologically as oral squamous cell carcinoma (OSCC) [2, 7, and 13]. The present study also reported Squamous cell carcinoma to be the most common malignant lesion (95% cases) in oral cavity.

Alike other Indian studies [7], [9],[14] SCC preponderance was seen in 40 – 60 years age group suggesting that oral SCC is a disease of late middle age group in our population, whereas western literature reports oral SCC in elderly age group between 51- 80 years [12, 15].

Though slight male preponderance was observed in this study with the male to female ratio of 1.24:1, but, it was not too high as seen in some other Indian studies as follows:

| Author | Year | Male-Female Ratio |
|-------------------------------|------|-------------------|
| Iype et al[16] | 2001 | 2.31:1 |
| Ravi mehrotra et al.[7] | 2003 | 3.27:1 |
| Preeti sharma et al.[17] | 2009 | 2.2:1 |
| Aggarwal,Rajardekar et al[18] | 2010 | 3.57:1 |

This can be either attributed to increased consumption of tobacco and other products amongst females or increased awareness and attention paid towards their own health to seek early medical intervention.

Buccal mucosa was found to be most frequently involved site followed by tongue. Bhurgiri (2005) [19], Nair MK (2007) [20], Preeti Sharma (2009) [17] also reported buccal mucosa to be the most frequently involved site. SCC at buccal mucosa was more common in female (19 cases, 51.4%) than in males (12 cases, 25.5%). In males most common site was tongue (15 cases, 31.9%). Tongue is the most common site for intraoral cancer among Europeans and United states, amounting to 40-50% of oral cancers [12, 21]. These gender or geographic variations could be attributed to the preferred way of tobacco consumption i.e. chewing rather than smoking.

Studies have suggested that 4-6% of oral cancers now occur at ages younger than 40 years. An alarming increase in incidence of oral cancers among younger people has been reported from many parts of the world [22]. Unfortunately this study has also reported higher incidence (15 cases, 18.1%). It has been suggested that greater attention should be paid to family history and possible hereditary predisposition in younger patients with oral cancer [21, 23].

Premalignant Lesions

The term "oral potentially malignant disorders" (OPMD) was recommended by an international working group convened by the WHO collaborating centre for oral cancer and precancer in London in 2005. Leukoplakia, erythroplakia, oral sub-mucous fibrosis,

Lichen planus, palatal lesions in reverse smokers, actinic keratosis, discoid lupus erythematosus, and dyskeratosis congenita and epidermolysis bullosa fall into the broad definition of oral potentially malignant disorders. Estimated global prevalence of oral potentially malignant disorders range from 1-5%, although much higher prevalence are reported

from South East Asia, usually with a male preponderance, from (11.3%), to (12.7%) [22]. The present study reported prevalence of 11.9 % with male preponderance and leukoplakia being the commonest (76.5%). Ravi Sharma et al [24] reported premalignant lesions in 29.8 % cases. These wide variations in two regions of India may be attributed to the better awareness and thus early seeking of medical attention by the specific population.

Benign Lesions

Benign lesions were reported in 28.7% cases in younger age group. Ravi Mehrotra et al reported benign tumors in 31.7 % cases [24]. Majority (60.9%) of the benign lesions were of soft tissue origin. Haemangioma was the commonest (24.4%) followed by granuloma pyogenicum (14.6%). Papilloma and mucocele were the commonest epithelial origin benign lesions, observed in 12.2% cases each. In a large study of 260 cases on soft tissue tumor like lesions irritation fibroma was the most commonly reported lesion [25]. In few other studies [26, 27] papilloma and fibroepithelial polyp were reported commonly. Most studies also demonstrated a definite female predilection, however, present study showed male preponderance. In the present study, as only small number of benign tumours and tumour like lesions were encountered, therefore, no statistically significant association was established between type of benign lesion with age, gender, site and etiology.

Growth Patterns

A significant finding was recorded in this study that both benign and malignant lesions predominantly presented as exophytic proliferative growth. This develops suspicion of cancer and causes apprehension in the minds of both patients and clinicians. Besides this malignant lesions were noted to present as not only growth or ulcer but cyst and plaque as well. Thus the oral cavity lesions should not be ignored, and early histopathology evaluation should be performed.

Table 1: Site wise and behaviour wise distribution of all tumor and tumor like lesions of the oral cavity (in number and percentages)

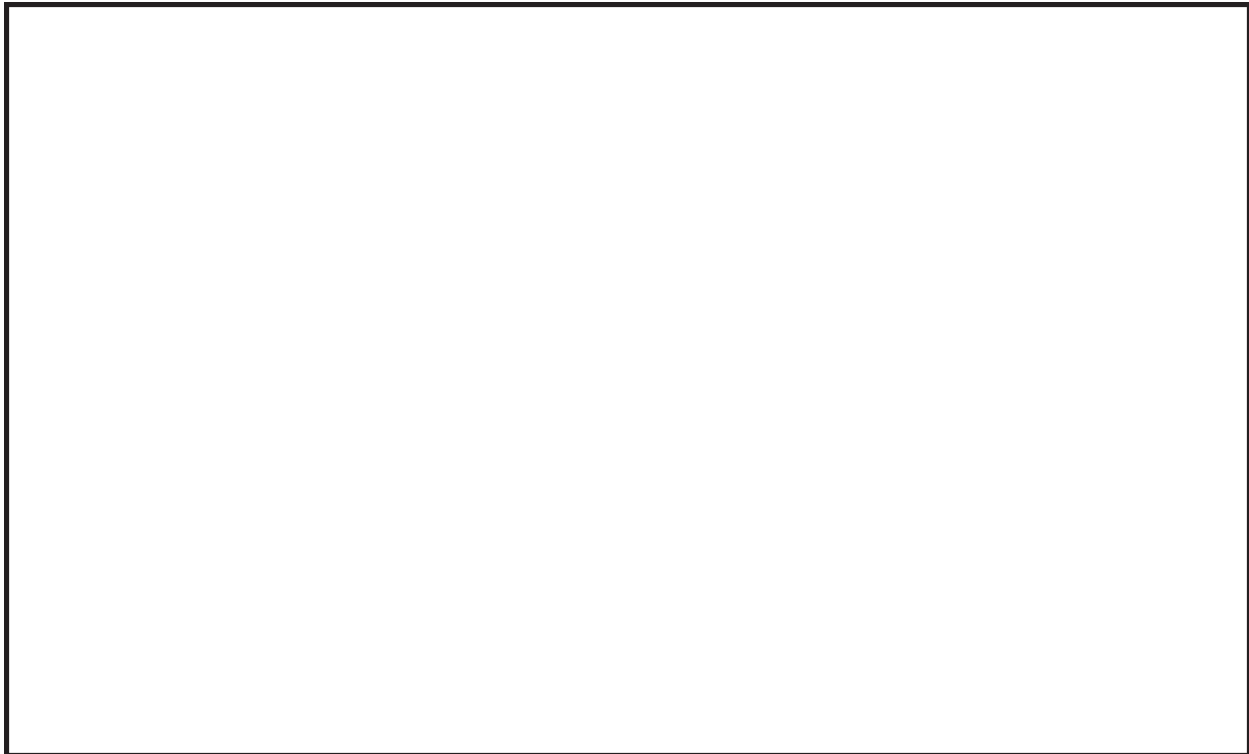
| Site | Malignant (n=85, 59.4%) | Benign (n=21, 14.7%) | Premalignant (n=17, 11.9%) | Tumor like (n=20, 14%) | Total (n=143,100%) |
|-----------------------|----------------------------|-------------------------|-------------------------------|---------------------------|-----------------------|
| Lip | 8(36.4%) | 4(18.2%) | 2(9.1%) | 8(36.4%) | 22(15.4%) |
| Buccal mucosa | 31(58.5%) | 8(15.1%) | 10(18.9%) | 4(7.5%) | 53(37.1%) |
| Tongue | 24(63.2%) | 8(21.1%) | 3(7.9%) | 3(7.9%) | 38(26.6%) |
| Gingivo-buccal sulcus | 13(81.3%) | 1(6.2%) | 1(6.2%) | 1(6.2%) | 16(11.2%) |
| RMT | 5(71.4%) | 0 | 0 | 2(28.6%) | 7(4.9%) |
| FOM | 5(62.5%) | 0 | 1(12.5%) | 2(25%) | 8(5.6%) |
| Hard palate | 1(100%) | 0 | 0 | 0 | 1(0.7%) |

Table 2: Behaviour wise distribution of growth patterns of oral cavity lesions (in number and percentage)

| Type of growth Behaviour | Plaque (n=, %) | Ulcer (n=, %) | Cyst (n=, %) | Proliferative (n=, %) | Total (143, 100%) |
|--------------------------|-------------------|------------------|-----------------|--------------------------|----------------------|
| | (11, 7.7%) | (19, 13.1%) | (9, 6.3 %) | (120, 83.9%) | |
| Malignant | 3(3.5%) | 17(20%) | 1(1.2%) | 64(75.3%) | 85(100%) |
| Premalignant | 7(41.2%) | 2 (11.8%) | 0(00%) | 8(47%) | 17(100%) |
| Benign +tumor like | 1(3%) | 0(00%) | 8(19%) | 32(78%) | 41(100%) |

Table 3: Site Wise Distribution of Oral Scc (in Number and Percentage)

| Site | Male (n=, %) | Female (n=, %) | Total (n=, %) |
|-----------------------|----------------|----------------|-----------------|
| Lip | 4(8%) | 3(9.1%) | 7((8.5%) |
| Buccal mucosa | 11(22%) | 17(51.5%) | 28(34.1%) |
| Tongue | 20(40%) | 6(18.2%) | 26(31.7%) |
| Gingivo buccal sulcus | 7(14%) | 4(12.1%) | 11(13.4%) |
| Retro molar trigone | 3(6%) | 2(6.1%) | 5(6.1%) |
| Floor of mouth | 4(8%) | 0 | 4(4.9%) |
| Hard palate | 0 | 1(3.03%) | 1(1.3%) |
| Total | 50(60%) | 33(40%) | 82(100%) |

Figure 1: Distribution of malignant tumors in oral cavity (in numbers and percentage)

Conclusion

Data of oral biopsy and resection specimen sent to a tertiary referral hospital pathology laboratory over a period of two years was collected and interpreted. Majority of the lesions presented as exophytic proliferative growth, irrespective of the nature, that cause suspicion of cancer. Histopathological evaluation determined the accurate diagnosis and nature of the various lesions. Oral malignancy was more common. OSCC was most common of all oral malignancies, of which most were in the age group of 40-60 years. Though this study is of shorter duration and of specific population, but it still reflects the alarming situation of oral cancer in India. Crude incidence projections by GLOBOCAN (2008), an IARC project, demonstrate that oral cancer crude incidence will increase in India by 2020 and 2030 in both sexes [11]. Despite the fact that oral cancer and consequences can be prevented, treated, and controlled, there exists a significant gap in the Indian public's knowledge, attitudes, and behaviours. Efforts must be made to introduce a suite of preventive measures that has the potential to significantly reduce the burden and to help bridge the gap between research, development and public awareness. Recently a study from India demonstrated that oral

cancer screening by trained health workers can lower mortality of the disease especially in individuals with a history of tobacco use [28]. Therefore, it is imperative that cost-effective oral cancer screening and awareness initiatives like oral screening by trained health workers and self mouth screening be introduced in high-risk populations of India.

Limitation

Data obtained and interpreted from a single institution has obvious limitations. The data reflects the specific population reporting to this hospital and not the community as a whole. Further such studies for longer duration at different level of health care centres may help in identifying the prevalence patterns of this alarming disease, so that prevention activities can be carried out in order to decrease the incidence and mortality rates due to oral cancer.

References

1. Stephen B.E., David R.B., Carolyn C.C., April G.F., Frederick L.G., Andi T (Eds.): AJCC Cancer

- Staging Manual. Lip and Oral Cavity. Springer Verlag, New York 2009:29-41.
- Barnes L., Everson J.W., Reichart P., Sidransky D. (Eds.): World Health Organization Classification of Tumors. Pathology and Genetics of Head and Neck Tumors. IARC Press: Lyon 2005:168.
 - Peter AH, Louis PD, John DP (Eds.): Washington manual of Surgical Pathology. Oral cavity and oropharynx. Lippincott Williams and Wilkins: USA 2008.
 - Noel W., Kurt M., Richard J.C., Suster S., Lawrence MW. (Eds.): Modern Surgical Pathology. Head and Neck. WB Saunders: Philadelphia 2009:1.
 - Crispian S., Oslei PA, Jose B, Pedro DD, Adalberto MT (Eds.): Oral Medicine and Pathology at glance. Swellings: reactive lesions. Wiley Blackwell: UK 2010.
 - Barnes L (Ed.): Surgical Pathology of Head and Neck. Benign and non neoplastic disease. Informa Health Care: New York 2008:1
 - Ravi M, Mamta S et al. Age specific incidence rate and pathological spectrum of oral cancer in Allahabad. Indian Journal of Medical Sciences 2003; 57:400-4.
 - Saraswathi TR, Ranganathan K, Shanmugam S, et al. Prevalence of oral lesions in relation to habits: Cross sectional study in South India. Ind J Dent Res 2006; 17:121-5.
 - Kiran G, Shyam NDVN, Rao J, Krishna A, Reddy BS, Prasad N. Demographics and Histopathological patterns of Oral Squamous Cell Carcinoma at a tertiary level referral hospital in Hyderabad , India: A 5 year retrospective study. J Orofac Res 2012; 2:198-201.
 - Elango JK, Gangadharan P, Sumithra S, Kuriakose MA. Trends of head and neck cancers in urban and rural India. Asian Pacific Journal of Cancer Prevention 2006; 7:108-12.
 - Ken RC. Challenges of the Oral cancer burden in India. Journal of Cancer Epidemiology 2012;2012:1-17 Article ID 701932.doi:10.1155/2012/701932.
 - Warnakulasuriya S. Global epidemiology of Oral and Oropharyngeal cancer. Oral Oncology 2009; 45:309-16.
 - Vatsala M, et al. Changing patterns of Oral cavity lesions and personal habits over a decade: Hospital based record analysis from Allahabad. Indian J Community Med 2009; 34:321-25.
 - Khandekar SP, Bagdey PS, Tiwari RR. Oral cancer and some epidemiological factors: A hospital based study. Indian J Community Med. 2006; 31:157-9.
 - Barnes L(Ed.). Surgical Pathology of Head and Neck. Cancer of the Oral cavity and Oropharynx. Informa Health care: New York 2009:1.
 - Iype EM, Pnadey M, Mathew A, Thomas G, Sebastian P, Nair MK. Oral cancer among patients under the age of 35 years . J Postgrad Med. 2001; 47:171-6.
 - Preeti S et al. Trend in the epidemiology of Oral Squamous Cell Carcinoma in Western UP: An institutional study. Indian J Dent Res 2010;21:
 - Agrawal KH, Rajderkar SS. Clinico-epidemiological profile of Oral cancer: A hospital based study. Indian Journal of Community Health 2012; 24:80-5.
 - Bhurgiri Y. Cancer of the Oral cavity. Trends in Karachi South (1995-2002). Asian Pac J Cancer Prev 2005; 6:22-6.
 - Nair MK, Sankarnarayan R, Padmanabhan TK, Padmakumari G. Clinical profile of 2007 Oral cancer in Kerala India. Ann Dent 1988; 47; 23-6.
 - Silvio KH, Fabio PFB, Sibeles SP, Norberto NS, Dante AM. Risk factors for Oral Squamous Cell Carcinoma in young and elder Brazilian patients: A comparative analysis. Med. Oral Patol Oral Cir Bucal 2008;13:E227- 31
 - Jhonson NW, Prasanna J, Hemlatha AA, Amarsinghe K. Squamous Cell Carcinoma and Precursor lesions of the Oral cavity: Epidemiology and Aetiology. Periodontology 2000 2011;57:19-37.
 - Llewellyn CD, Johnson NW, Warnakulasuriya S. Risk factors for Oral cancer in newly diagnosed patients aged 45 years and younger: A case control study in Southern England. J Oral Patol Med 2004; 33:525-32.
 - Ravi M, Shruti P, Ajay KC Mahendra K, Mamta S. Prevalence of Oral premalignant and malignant lesions at a tertiary level hospital in Allahabad, India. Asian Pac J cancer Prev 2008; 9:263-66.
 - Maryam AHP, Rad M, Mojtahedi A. A survey of soft tissue tumor like lesions of Oral cavity: A clinicopathological study. Iranian Journal of Pathology 2008; 3:81-7.
 - Rafindadi AH, Ayuba GI. Oral tumors in Zaria. Nig J Surg Res 2000; 2:21-5.