



“UTILITY OF SCRAPE CYTOLOGY IN EARLY DIAGNOSIS OF ORAL CAVITY LESIONS- A STUDY OF 115 CASES AT A TERTIARY CARE CENTRE.”

Pathology

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ABSTRACT

Background: The oral squamous cell carcinoma (OSCC) is the most common cancer worldwide and constitute a major health problem in developing countries, representing the leading cause of death. The oral cavity can be involved by a variety of lesions. These can be benign, premalignant or malignant. The most common carcinogenic agents associated with oral cavity lesions are tobacco, alcohol and betel nut (pan). **Aims and Objectives:** 1. early detection of premalignant and malignant oral lesions. 2. To confirm the cytological findings by histopathological examination **Materials and Methods:** scrapped smear from 115 cases of oral cavity lesions were prepared and stained with MGG and PAP for cytological examination. The specimen/ biopsy material from oral cavity was collected, fixed in 10% formalin and stained with H&E for Histopathological examination. **Study period:** July 2021 to June 2022. **Results:** Out of 115 cases 23 were non- neoplastic, 22 cases were premalignant (dysplasia) and 70 cases were malignant in cytological examination. Overall, the scrape cytology diagnosis was concordant with final histopathological diagnosis in 109 cases out of 115 cases with diagnostic accuracy 94.78%. The sensitivity was 92.11% and specificity was 100%. **Conclusion:** Oral scrape cytology is a rapid, painless, safe, inexpensive method for screening and can diagnose a large number of patients in a short time. This method can be used for mass screening of population.

KEYWORDS

Oral cavity, Oral squamous cell carcinoma, Premalignant lesions, scrape cytology, scrape smear.

INTRODUCTION

Among all types of cancers, oral cancer is documented to be the sixth most common type of cancer worldwide¹. India has the largest number of oral cancer cases and one – third of the total burden of the oral cancer globally².

In North-eastern India, where this study was conducted, tobacco related oral malignancy is very common which may be due to widespread habit of chewing tobacco. The prevalence is found to be significantly high at 54.48%, affecting males more than females in the age group of 40-69 years. Oropharynx and oral cavity of HNCA constituted a major burden of total body cancer¹⁶.

The oral cavity can be involved by a variety of lesions. These can be benign, Premalignant or malignant.

The most common benign lesions of oral cavity are lymphoid hyperplasia, retention cyst, inflammation, haemangioma, fibroma etc. Squamous cell carcinoma is the most common malignant lesion³. Oral lesions like leucoplakia, erythroplakia and oral submucous fibrosis are considered to be premalignant lesions.

The oral cavity is at continuous exposure to both inhaled and consumed carcinogens and therefore it is one of the most common site for the origin of malignant neoplasm⁴.

The most common carcinogenic agents associated with oral cavity lesions are tobacco, alcohol and betel nuts (pan). Scrape cytological study of oral cells is less painful, non-invasive technique that is well accepted by the patient, and it is an attractive option for the early diagnosis of potentially malignant and malignant lesions of oral mucosa.

AIMS AND OBJECTIVES

1. For early detection of premalignant and malignant oral lesions
2. To confirm the cytological findings by histopathological examination.

MATERIALS AND METHODOLOGY:

This is a cross sectional study done for a period of 1 year in the Department of Pathology, GMCH. The study was approved by the Ethical committee of the institution.

Inclusion Criteria

- Scrapping of suspected premalignant and malignant lesions from oral cavity.

- Punch biopsies, surgically resected specimen of clinically suspected oral cavity lesions.
- Patients of all age groups and both sexes who have given consent are included.

Exclusion Criteria

- Inadequately preserved specimens with handling artifacts.
- Improper clinical record (History and examination).
- Neoplasm arising from nasopharynx and oropharynx.
- Patients who do not give consent.

Source Of Data:

The study included all cases of oral cavity lesions, that came to the Department of Pathology, Gauhati Medical College and Hospital from Department of Otorhinolaryngology and Department of Head and Neck Oncology, State Cancer Institute, GMCH.

Staining For Cytological Examination

Scrapping were prepared from oral lesions, stained with MGG and PAP for cytological examination.

The cytological smears were made as per following procedure:

The procedure was explained to the patient and consent was taken. The patient was asked to rinse the mouth with normal saline to remove any necrotic slough. Any dry lesion was moistened with normal saline.

The lesions were scrapped with wooden spatula/brush and material obtained was smeared on glass slide. The slides were fixed in methanol for 10 minutes to be stained with MGG. The slides for PAP stain were fixed immediately with 95% ethanol.

In all patients biopsy was done, later tissue was formalin fixed, processed and stained with hematoxylin and eosin. Histopathology was considered gold standard for final diagnosis. All statistical analysis was performed by using SPSS21.0 version software for windows.

RESULTS:

During the period of July 2021 to June 2022 patients attending the Department of Otorhinolaryngology, GMCH and State Cancer institute, GMCH with clinical diagnosis of suspected premalignant and malignant lesions in the oral cavity were taken for the study. Total 115 cases were selected and subjected to scrape cytology. Following that biopsy was taken.

Table 1: Distribution Of Age

Age	Frequency	Percent
11--20	3	2.6
21--30	5	4.3
31--40	13	11.3
41--50	23	20
51--60	39	33.9
61--70	23	20
71--80	7	6.1
81--90	2	1.7
Total	115	100

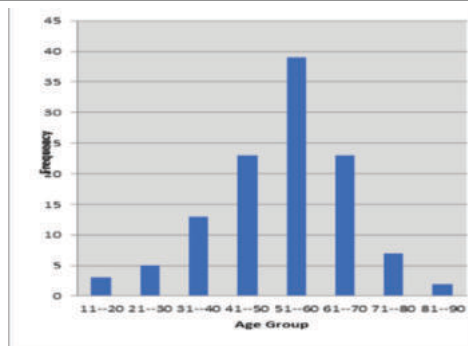


Fig 1: Distribution Of Age

Out of 115 cases maximum cases were in 51- 60 years (33.9%) followed by 41-50 years (20%).

Table 2: Percentage Wise Sex Distribution

Sex	Frequency	Percent
F	41	35.7
M	74	64.3
Total	115	100

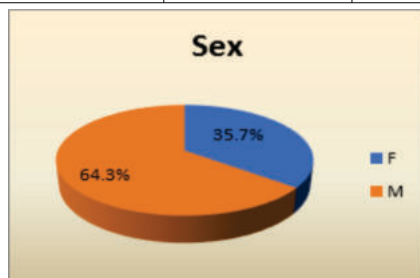


Fig 2: Percentage Wise Sex Distribution

In this study, out of 115 cases 74 (64.3%) were male and 41 (35.7%) were female. The male to female ratio is 1.80:1 thereby showing predilection of male sex in oral cavity lesions.

Table 4: Distribution Of Risk Factors

HABITS	F	M	TOTAL
None	2(4.9%)	7(9.5%)	9(7.8%)
A(ALCOHOL)	1(2.4%)	42(56.8%)	43(37.4%)
P(PAN)	38(92.7%)	12(16.2%)	50(43.5%)
S(SMOKING)	1(2.4%)	44(59.5%)	45(39.1%)
Tc(TO BACCO CHEWING)	23(56.1%)	52(70.3%)	75(65.2%)

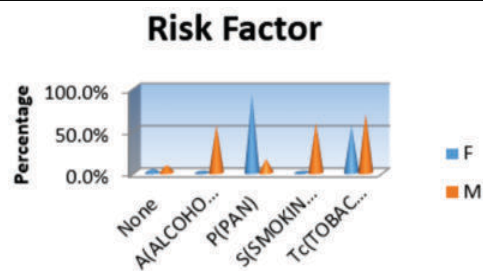


Fig 4: Distribution Of Risk Factors

Out of 115 cases most of the patients had history of chewing tobacco (65.2%) followed by pan (43.5%) followed by smoking (39.1%) and history of taking alcohol 37.4%.

Table 5: Distribution In Relation To Site Of Lesion

Site of lesion	Frequency	Percent
Buccal mucosa	49	42.6%
Angle of mouth	3	2.6%
Alveolus	4	3.5%
Floor of mouth	7	6.1%
Gingivobuccal sulcus	12	10.4%
Gingivolabial sulcus	2	1.7%
left mandible	1	0.9%
lips	21	18.3%
RMT(Retromolar trigone)	1	0.9%
Soft palate growth	2	1.7%
Tongue	11	9.6%
Total	115	100%

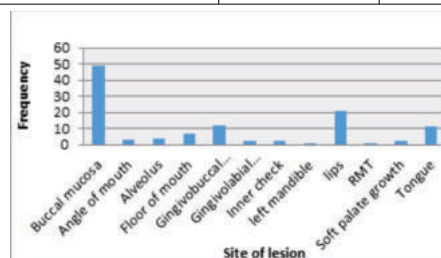


Fig 5: Distribution In Relation To Site Of Lesions

In our study, the most common site for occurrence of oral lesions were buccal mucosa in 49 (42.6%) cases, followed by lips in 21 (18.3%) cases followed by gingivobuccal sulcus in 12 (10.4%) cases.

Table 6: Distribution In Relation To Scrape Cytology Diagnosis

Cytological diagnosis	Frequency	Percent
Non neoplastic	23	20
Dysplasia	22	19.1
Malignant	70	60.9
Total	115	100

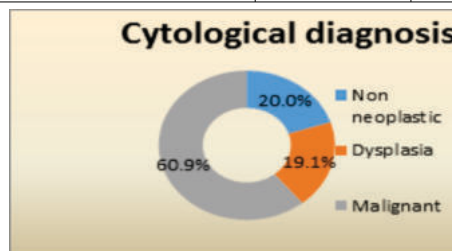


Fig 6: Distribution To Relation To Scrape Cytology Diagnosis

In scrape cytology both MGG and PAP stained smears 70 cases were reported as positive for malignancy, 22 cases as dysplasia, 23 cases were reported as non- neoplastic.

Table 7: Distribution In Relation To Hpe Diagnosis

Histopathological	Frequency	Percent
Benign	17	14.8
Pre Malignant	22	19.1
Malignant	76	66.1
Total	115	100

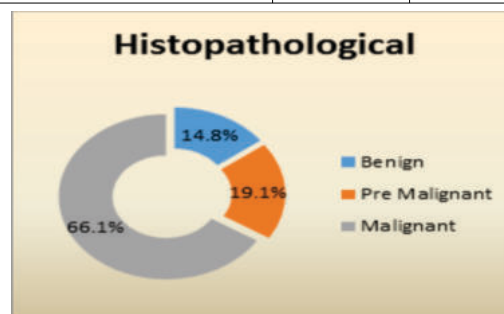


Fig 7: Hpe Diagnosis

Out of 115 cases 17 cases diagnosed as benign, 22 cases as premalignant and 76 cases as malignant.

Overall, the diagnostic accuracy of scrape cytology to differentiate non-malignant and malignant neoplasms was found to be 94.78%.

The sensitivity was 92.11% and specificity was 100% The positive predictive value and negative predictive value were 100% and 86.67% respectively.

Case Photographs:

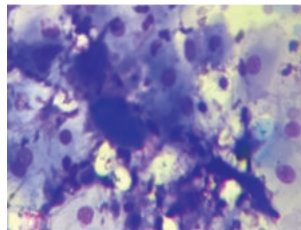


Fig 8: Mild dysplasia MGG

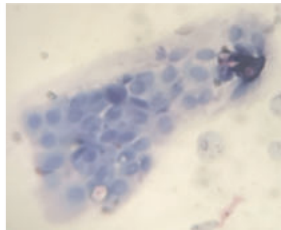


Fig 9: Mild dysplasia, PAP

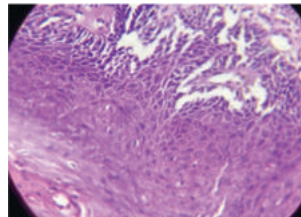


Fig10:Mild dysplasia, H&E,40X

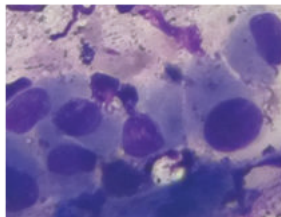


Fig11: Moderate dysplasia, MGG

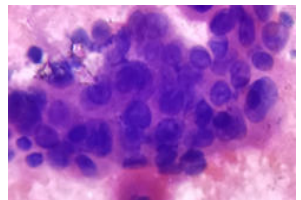


Fig 12: Moderate dysplasia, PAP

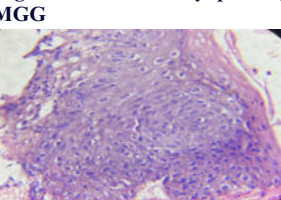


Fig13: Moderate dysplasia, H&E, 40X

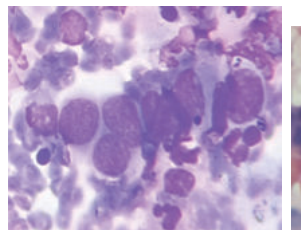


Fig 14: Squamous cell carcinoma, MGG

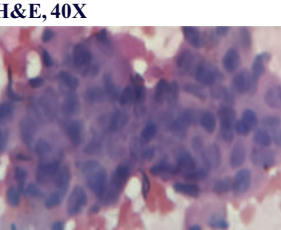


Fig 15: Squamous cell carcinoma, PAP

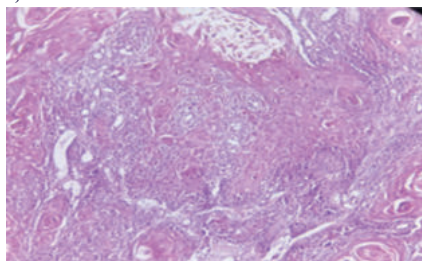


Fig 16: Squamous cell carcinoma, H&E

DISCUSSION:

A. Comparative Analysis Of Age Distribution:

In our present study, most of the patients having oral cavity lesions are in the age group of 51-60 years (33.9%), followed by the age group of 41-50 years (20%).

Gatoo MA et al⁵ (2018) found that maximum incidences of head and neck squamous cell carcinoma occur in the age group of 50-75 years. Bastakoti et al⁶ (2021) in their study found that the median age was 55.9 years Omer et al⁷ (2020) found maximum incidence of oral squamous cell carcinoma in the age group of ≥ 60 years.

B. Comparative Analysis Of Sex Distribution:

In our study; out of 115 cases, 74(64.3%) are males and 41(35.7) are females, showing a male predominance. Male to female ratio is 1.8:1

Mafi N et al⁸ (2012) found that male to female ratio was 1.5:1 in young adults and 5.6:1 in older age group.

Fan Y et al⁹ (2014) found 66% and 34% patients were male and female respectively in his study.

Gatoo MA et al⁵ (2018) found the male to female ratio 3:1 in his study. Bastakoti et al⁶ (2021) in their study found that Male to female ratio was 3:1

C. Comparative Analysis Of Distribution Of Habit:

In our study, out of total 115 patients having oral cavity lesions, most of the patients had history of chewing tobacco (65.2%), followed by history of consuming Pan (43.5%) and smoking (39.1%).

Wyss AB et al¹⁰ (2016) performed a study in regards to tobacco and he found that the use of smokeless tobacco and smoking has been associated with head and neck squamous cell carcinoma, particularly for oral cavity cancers.

Gatoo MA et al⁵ (2018) found a significant relationship between pan and tobacco chewing habit and oral squamous cell carcinoma in Indian population.

D. Comparative Analysis Of Distribution Of Locations:

In our present study, out of 115 cases, Buccal mucosa was the commonest site involved 49 (42.6%), followed by lips 21 (18.3%), gingivobuccal sulcus 12 (10.4%), and tongue 11 (9.6%).

Sankaranarayanan R et al¹⁴ (2005) study showed the most common site for oral malignant lesion was buccal mucosa i.e. 50.4%.

Richard M et al¹⁵ (2008) study showed the most common site for oral malignant lesion was Buccal mucosa i.e. 50.7%.

Bastakoti et al⁶ (2021) study showed the most common site for oral cavity lesions were Buccal mucosa i.e. 45.8%

E. Comparative Analysis Of Distribution Between Scrape Cytology Diagnosis And Histopathology Diagnosis

In the present study sensitivity of scrape cytology was 92.11%, specificity was 100%, positive predictive value was 100%, negative predictive value was 86.67% and accuracy was 94.78%.

Magdi Monsour et al¹¹ (2017) found sensitivity was 79%, specificity was 100%, PPV was 100% and NPV was 42%.

Aparaajita et al¹² (2018) study showed sensitivity was 93%, specificity was 80%, PPV 98%, NPV was 50% and accuracy was 91.60%.

Srilakshmi et al¹³ (2021) study showed sensitivity was 82%, specificity was 100%, PPV was 100%, NPV was 27.78%.

SUMMARY:

The present study was conducted on 115 patients having lesions of the oral cavity. Most of the patients were in the age group of 51-60 years (39.9%); followed by the age group of 41-50 years (20%) and 61-70 years were 20%.

Out of 115 cases, 74 (64.3%) were male and 41 (35.7%) were female. Male to female ratio is 1.8:1.

Out of total 115 patients having oral cavity lesions most of the patients had history of chewing tobacco (65.2%) followed by habit of consuming pan (43.5%) and smoking (39.1%).

In this study sensitivity was 92.11%, specificity was 100%, positive predictive value was 100%, negative predictive value was 86.67% and accuracy was 94.78%.

CONCLUSION:

This study was conducted in a tertiary care hospital of North East India. From the present study, it can be concluded that:

- In North East India oral cavity lesions are mostly prevalent in

elderly age group (51-60 years).

- Malignant tumours constitute the major bulk of all lesions.
- Squamous cell carcinoma is the most common malignancy of oral cavity which occurs mostly at 6th decade of life.
- The scrape cytology is painless, easy to perform, non-invasive and well accepted by the patients. It is also useful in mass screening programmes and in patients not willing to go for histopathological examination at the early stage of the disease.

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