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Original Research Article

DIAGNOSIS OF ORAL MALIGNANCIES BY ORAL BIOPSY AND EXFOLIATIVE CYTOLOGY- A COMPARATIVE STUDY

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Abstract

Background: Oral squamous cell carcinoma is common cancer globally, particularly in India, where it is the most common cancer among males. Symptoms include non-healing ulcers on the tongue, the floor of the mouth, or the inner cheek. Aim: The current study aims to compare the oral biopsy and exfoliative cytology in the diagnosis of oral malignancies. **Materials and Methods:** Patients with clinical suspicion of oral malignancy were included in this study and treated under the Department of General Surgery on an IP/OP basis from June 2019- June 2021. The lesion was scraped using a coverslip to collect cells, which were then spread onto a glass slide and fixed. The scraping should be vigorous but not painful for the patient. **Result:** In this study, the male-to-female sex ratio for oral malignancy was 2.6:1. Most cases occurred in the fifth decade with a mean age of 54 years ± 10 years. The most common sites for oral carcinoma were the cheek and tongue, followed by the lip and floor of the mouth. The procedure's sensitivity was 83.2%, and the specificity was 100%. **Conclusion:** The exfoliative cytology could detect malignancy in about 83.4% of those detected by biopsy and histopathological examination. This observation agrees with multi-centric international studies where the detection rate was about 90%. In addition, the process is inexpensive, and quicker results are obtained. These elements might make exfoliative cytology more acceptable as a screening method.

INTRODUCTION

The incidence rates of oral cancers widely vary among different countries. The male-to-female ratio of oral malignancy in India is 1.8:1 and is growing at an average annual rate of 0.19%.[1] Oral cancer, specifically oral squamous cell carcinoma, is a common type of head and neck cancer.[2,3] The diagnosis of precancerous lesions is primarily based on the morphology of cells and their grading on histology, such as dysplasia. However, due to the subjective nature of this method, these lesions may be considered potentially malignant.[4,5] Leukoplakia is a potentially malignant disorder characterized by white plaques on the oral mucosa, which may be localized or diffuse. These cancerous lesions are often benign in appearance and asymptomatic in their early stages, making early detection and

diagnosis important.[6] Sudan and many other countries, oral cancer is often not diagnosed or treated until it reaches an advanced stage, and early detection is crucial for successful therapy.[7,8] Exfoliative cytology is a commonly used method for the early detection of oral cancer. It is a painless, non-invasive, quick, and simple procedure that can diagnose precancerous lesions by evaluating cell morphology.[9] The definitive diagnosis of cancer is made through biopsy. Exfoliative cytology can be used as a supportive tool with biopsy for diagnosing oral cancer, allowing for repeated testing, follow-up, and research purposes. Exfoliative cytology is a cost-effective, easy and non-invasive way to screen individuals for oral cancer, which can help in the early detection of oral cancer. Using exfoliative cytology can help reduce the risk of false-negative biopsies and eliminate the risk of post-biopsy

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complications. It has varied histological presentations and can be used to detect mild hyperkeratotic lesions and severe dysplastic features. This method can be especially beneficial for patients with systemic diseases, such as those with bleeding disorders or who are taking blood-thinning medications.[10,11] Using exfoliative cytology can help reduce the risk of false-negative biopsies and eliminate the risk of post-biopsy complications. The results from exfoliative cytology can help guide the biopsy by identifying the area of the oral cavity that should be biopsied. Exfoliative cytology plays a supportive role in a properly planned and carefully executed biopsy by providing additional information that can aid in diagnosing oral cancer.[12] This study aims to diagnose oral malignancies through oral biopsy and exfoliative cytology to establish the most accurate and effective method for early detection of oral cancer.

MATERIALS AND METHODS

This comparative study was done in Sri Muthukumaran medical college & hospital. We included all the patients with clinical suspicion of oral malignancy and were treated under the Department of General Surgery on an IP/OP basis for two years (June 2019 – June 2021). This includes patients referred from other departments and those treated in the surgical department after mass screening programmes.

Technique
The necessities for oral cytology are 2 glass slides and a cover slip for each lesion, a pair of gloves, a Koplin jar with fixative (80% alcohol) and a request for a Tissue Examination form.

The sequence of Events

The patient must be explained the examination's purpose and the technique's general steps before doing the smear. Write the patient's name, the date of examination and the anatomic location of the smear on the frosted end of a glass slide with a pencil. This should be done simultaneously on two glass slides per lesion because two smears will increase the probability of getting an adequate number of cells. Take the coverslip from the box and put the gloves on. With a gauze, gently remove any excess saliva in the area that is supposed to be smeared. Next, scrape the entire lesion with the coverslip. The scraping should be vigorous enough to be noticeable and may generate a small amount of bleeding but must not be painful to the patient. Take the coverslip and spread the harvested cells onto the glass slide by starting from the frosted end and spreading until the other end is reached. We should ensure that white, filmy debris is seen on the glass slide. If the slide appears to be completely clear, then it might mean that there are no cells on it. The slide should be placed immediately in the Koplin jar containing the fixative. The cells will degenerate when they are allowed to air dry. The alcohol fixative prevents the cells from degenerating for days to weeks. Repeat the similar procedure for the second smear on the same lesion. Fill out the request for tissue examination form, including information about the patient, lesion site, clinical description and clinical impression. In case of multiple lesions, using a different coverslip is mandatory to prevent the crossover of the cells placed on the glass slides. The same request form for tissue examination is used and indicated if there is more than one lesion.Data were presented as frequency and percentage. Data analysis was performed using IBM-SPSS version 21.0 (IBM-SPSS Science Inc., Chicago, IL).

RESULTS

Table 1. Age and gender distribution of patients with diagnosed oral cancer

Age	Male	Female	Total
19-30	2	1	3
31-40	5	5	10
41-50	13	8	21
51-60	11	5	16
>60	12	4	16

The data is broken down by age and gender distribution of all the diagnosed carcinoma, with age ranges divided into five categories: 19-30, 31-40, 41-50, 51-60, and over 60. The number of males and females in each age category is also provided; the total number of males was 53, and the females were 20. There was a 1.9:1 ratio between males and females. The table shows that the largest age group is the 41-50 age range, with 21 people, and the smallest age group is the 19-30 age range, with only 3 people. Exfoliative cytology has a high specificity of 100%, which means that it is unlikely to give false positive results. However, its sensitivity is

83.4%, meaning it may miss some cases of oral cancer, so it's often combined with other diagnostic methods.
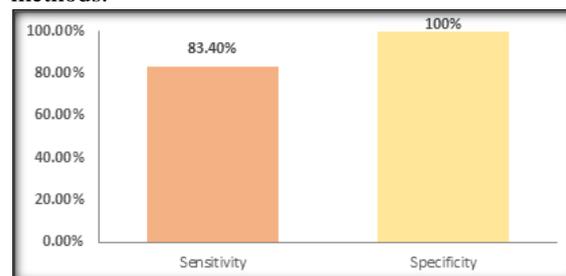
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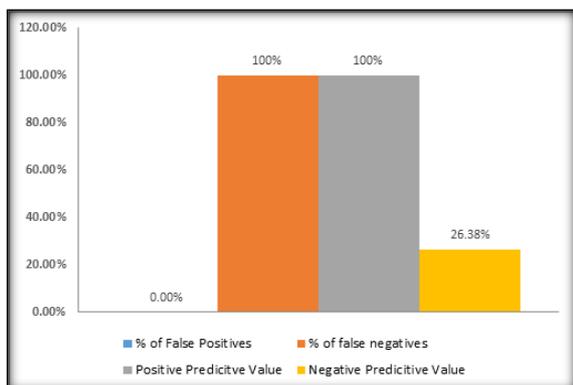
Figure 2.

DISCUSSION

Oral biopsy and exfoliative cytology are two diagnostic methods used to detect oral malignancies or cancers of the mouth.13 In general, an oral biopsy is the gold standard for diagnosing oral malignancy, as it allows for directly examining tissue samples under a microscope. Oral biopsy typically has a high sensitivity and specificity for detecting oral cancer, with reported sensitivity rates ranging from 80-90% and specificity rates ranging from 90-100%.[14] On the other hand, exfoliative cytology is a non-invasive method that involves collecting cells from the surface of a lesion or area of concern and examining them under a microscope. The sensitivity and specificity of exfoliative cytology can vary depending on the type of lesion being examined and the experience of the cytologist interpreting the results.[15,16] The sensitivity of exfoliative cytology can be improved by using certain techniques, such as fixing agents and cytobrushes, to increase the yield of exfoliated cells. Exfoliative cytology is a more cost-effective and faster method for diagnosing oral malignancy when compared to biopsy. Additionally, it has a high detection rate of 83.4% for malignancy compared to the results obtained from histopathological examination and biopsy.[17] The current study's findings align with other international studies, where the detection rate of oral malignancy using exfoliative cytology is around 90%. Given the high sensitivity of 83.4% in populations with a high prevalence of malignancy, the value of this test as a screening procedure is significant. In addition, the cost-effectiveness and rapid results obtained from exfoliative cytology make it a viable option as a screening tool for diagnosing malignant conditions. The use of oral cytopathology, specifically exfoliative cytology, is a convenient diagnostic technique that is simple, non-invasive, and relatively painless.[9,11] Furthermore, it provides rapid results. In addition to detecting malignant lesions, exfoliative cytology of oral mucosa is also useful in identifying certain types of infectious lesions, such as oral tuberculosis.[18] Due to these benefits, exfoliative cytology is well suited for routine screening programs, early detection of suspicious lesions, and monitoring malignant lesions

after treatment. Exfoliative cytology is especially helpful when patients are unwilling to undergo a biopsy or when performing a biopsy would be too risky due to the patient's medical condition. Patients concerned about the nature of their oral changes can also benefit from it, especially if they fear cancer or have a family history of the disease. Exfoliative cytology can offer a rapid and precise diagnosis that can lessen the patient's fear and anxiety.[19]

CONCLUSION

Exfoliative cytopathology had good diagnostic concordance with the histopathological method, with high specificity, sensitivity, positive predictive value (PPV), and accuracy. However, sensitivity was comparatively lower. The histopathological method should be used when the cytopathological diagnosis is inconclusive, such as when it is positive for epithelial dysplasia or suspicious for OSCC, to minimize the time between diagnosis and treatment. When the cytopathological diagnosis is conclusive for OSCC, the result should be used to refer the patient to the oncology centre for therapy. However, the risk of false-negative and false-positive outcomes should be considered.

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