CURRENT ASPECTS OF ORAL SQUAMOUS CELL CARCINOMA IN PAKISTAN: A REVIEW

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Abstract

Oral squamous cell carcinoma (OSCC) is a public health burden worldwide due to its transience and fatality rate. The incidence of oral squamous cell carcinoma varies around the globe due to demographic and genetic differences. Oral cancer is the second most prevalent oral pathology in Pakistan which ultimately leads to death. Recent study divulged that the Pakistan has the increasing trend towards the OSCC, and the incidence rate of Pakistan is like Iran and India. Human papilloma virus and betel nut are the root causes for the development of oral cancer. Oral squamous cell carcinoma occur in the oral cavity. OSSC may present as a well-established to ambiguous lesion like exophytic lesion, endophytic lesion, or sometimes in erythroleucoplastic pattern. In current situation, the use of advance technologies for early detection and prevention can overcome this burden from the population. Due to lack of local literature we rally to review the published literature on Pakistan. The collection of published studies was made by using PubMed, NCBI and Google Scholar as database search engine. We searched and included only Pakistan based population studies during the year between 2016 to 2020. We conclude that OSCC is the highly prevalent oral pathology in Pakistan with male preponderance. Most common risk factor being betel nut followed by tobacco and Grade-II carcinoma is highly prevalent oral cancer in our population.

Keywords: Oral cancer, oral squamous cell carcinoma, risk factors, Pakistani population.

Introduction

Oral squamous cell carcinoma (OSCC) is a public health burden worldwide due to its transience and fatality rate. The incidence of oral squamous cell carcinoma varies around the globe due to demographic and genetic differences. [1] About 657,000 new cases of oral and throat cancer are diagnosed leading to 330,000 deaths annually based on exposure to risk factors. [2] International Agency for Research on Cancer (IARC) reported in 2018 that Asia-Pacific countries poses the top three rates of mouth cancer and betel nut is the most common oral carcinogen. [3] Taiwan ranks highest for the incident of oral cancer 32.46/100,000 subject. [4] it is the type of pathology predominantly found in males than females. [5]

In current situation, the use of advance technologies for early detection and prevention can overcome this burden from the population. Alongside diagnostic modes and treatment plan, there is education of the patient regarding risk factors or the cessation of habits which is the basic cause of this disease is also mandatory. [6] Oral hygiene is the one of the major prevention tools for oral cancers. However, we observed that there is lack of comprehensive studies or review on the prevalence of oral squamous cell carcinoma in Pakistan.

Therefor we gathered the published literature on Pakistani population for the last five years, 2016-2020.

Discussion

Oral cancer is the second most prevalent type of oral pathology in Pakistan which ultimately leads to death. [7] Recent study divulged that the Pakistan has the increasing trend towards the OSCC, and the incidence rate of Pakistan is like Iran and India.[8]

This review is steered according to the guidelines of preferred reporting items for the systematic reviews. The collection of published studies was made by using PubMed, NCBI and Google Scholar as database search engine. We searched and reviewed total 33 only Pakistan based population studies during the year between 2016 to 2020 by using the key words "oral cancer, oral squamous cell carcinoma, Pakistani population".

We included, Studies present only in English. We also inspected the bibliographies of the studies, contain minimum 40 subjects, studies only reporting oral squamous cell carcinoma. We excluded, all the studies reported on population other than Pakistan and whose major focus on co-
morbid conditions. The appropriate data was retrieved by reviewing the full text articles. Data collection included the frequency and grades of OSCC, age, sex, region of the study and year of publication.

Risk Factors

Human papilloma virus, betel nut, tobacco, ultraviolet radiation, and alcohol consumption are the root causes for the development of oral cancer.\[9\] According to World Health Organization (WHO), due to the consumption of tobacco the death rate is approximately 6.4 million per year and the 100 of billion dollars of economic mutilation around the world.\[10\] Oncogenic virus like Human papilloma virus infection possess the burden up to 30% for the development of the oral cancer.\[11\] Risk for the development of oral squamous cell carcinoma is increasing with increment of age due to prolong exposure to the risk factor and the probability of mutations and epigenetic changes which causes inhibition of many of the normal immune functions and modification of the epithelial cells of the host causing oxidative stress which aids the development the OSCC.\[12-13\]

Site of Lesion

Oral squamous cell carcinoma occur in the oral cavity, may involve only the tongue, lips, gums, oral mucosa, pharynx or larynx.\[14\] Oral cancer may present as a well-established to ambiguous lesion like exophytic lesion, endophytic lesion, erythroplastic, leucoplastic or sometimes in erythroleucoplastic pattern.\[15\]

TNM Stage Classification

The most huge and prescient factor which will decide the endurance rate is the phase of the tumor during the determination. The TNM arrangement is an overall known strategy for oral malignant growths organizing which is utilized by medical services professionals, for example, specialists, scientists and disease enlistment offices. The initials, T represents tumor, N for lymph nodes and M for metastases, depend on the estimations of the sickness before therapy. The primary job is to give an anatomical characterization and to appropriately portray the improvement of the malignancy. Explicit portrayal is the key for the choice of a right technique for treatment, the conceivable result and restriction for certain activities.\[16-17\]

Diagnostic Methods

Analysis of a dicey injury regularly starts with the customary oral assessment, which incorporates clinical assessment and palpation of the mucosa of the oral cavity under the lighting of the dental seat.\[18\] The capacity to make an analysis at a beginning phase of OSCC is significant so as to diminish the high pace of infection and passing among the patients. The most well-known strategies utilized for determination of PMDs and OSCC in a beginning phase are recorded underneath.\[19\]

Indispensable Staining

Strategies, for example, Toluidine blue (TB), Lugol's iodine staining, Methylene blue staining, Rose bengal staining. Recoloring with TB is a known strategy for the distinguishing proof of precancerous and cancerous lesions, which is prescribed to be as a feature of the clinical assessment of tissue of oral mucosa, particularly in high-hazard patients. Those strategies are not costly, very simple to apply and successful. The staining executed by different sorts of stains over the mucosa so as to check the neoplastic cells, cells with a high concepctive movement and to demonstrate the particular territories for assessment and biopsy.\[20\]

Light-based Detection

So as to distinguish oral PMDs and OSCC in their underlying stage, a few light-based gadgets have been created. Those particular gadgets can emanate certain light which will mirror the anomalous tissue and improve the clinical assessment.\[21\]

Histological Techniques

Incisional and additionally excisional biopsies are the most precise demonstrative strategies and along with the histopathological tests, stay as the most solid techniques for OSCC conclusion. Before the system of excisional biopsy, it is significant that the edges and profundity of the tissue will be checked of being free from the disease. The most prognostic indication of any threat is dysplasia of the epithelium. WHO have characterized the dysplasia as mild, moderate and severe.

Cytological Techniques

Those are techniques that uses magnifying instrument a microscope as to assess the cells which were gotten from smears, scratching and needle goal over different depts of the mucosa. The basic discoveries are a run of the mill mucosal injury which from the outset sight looks typical, yet the readied example will introduce atypical cells. The cytological tests which have been taken from the oral depression may assist with recognizing and determine tissues to have a high-hazard or even threat.\[22\]

Imaging Analytic Techniques

Those strategies incorporate neighborhood dental radiographs, orthopantomogram (OPG), attractive reverberation imaging (MRI), figured tomography perfusion (CTP), C-arm CT, atomic medication, for example, single-photon discharge processed tomography (SPECT), ultrasonography and blend of barely any techniques, for example, PET, CT/MRI and SPECT/C.\[23-24\]

Management

The most widely recognized therapy strategies for oral malignancy can be noninvasive, for example, radiotherapy in a large portion of the cases or can be intrusive, for example, medical procedure, which is typically the primary alternative

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of therapy in spite of the way that radiotherapy endurance rate and control of the anatomical site are comparable. Those strategies can be given independently or as a blend. [25]

Radiotherapy might be furnished independently or as a blend with chemotherapy so as to treat the underlying tumor. It might be given as neo-adjuvant treatment, which will diminish the tumor size before the underlying medical procedure. Radiotherapy may likewise be given as adjuvant treatment, which will improve the effectiveness of the underlying treatment and by doing so will drag out the endurance rate, decline the difference in conceivable repeat and even improve the indications of a late stage oral disease. [26] Radiotherapy has some significant downsides, for example, xerostomia, osteoradionecrosis, mucositis and long length of treatment which in instances of closeness deep down as well as youthful patients are not ideal. The therapy techniques for oral disease, for example, medical procedure, radiotherapy and chemotherapy majorly affect the patient's personal satisfaction and considered as cruel because of the area and the prominent methods of therapy. [27] The point of OSCC treatment techniques are to treat the underlying tumor and to safeguard however much as could be expected the shape and capacity with an appropriate reclamation. [28-29]

Prevention

So as to decrease the OSCC mortality among everyone, scarcely any means ought to be advanced. To start with, if there should be an occurrence of patients with high danger, the mortality might be decreased by advancing way of life changes and apply clinical assessment as an aspect of a wide demonstrative program among the populace. [30] Second, an instructive program with the essential information with respect to the OSCC ought to be installed in the populace while a successive expert demonstrative and pathologic information ought to be given to the medical services professionals. Third, the continuous and future investigates with respect to the OSCC must proceed so as to characterize the specific etiological components and biomarkers of the sickness. [31]
Only eight studies meeting the eligibility criteria were included in this systematic review.

Abidi et al., 2020 conducted their study at Ziauddin University Hospital (ZUH), Karachi. Total 140 cases of OSCC were taken, 110 males and 30 females. The mean age of cases was 46.99 years. Unemployment was present in approximately 38.9% cases. Most prevalent risk factor in 77% of total cases was habit of smokeless tobacco. The most common site of lesion was buccal mucosa in 66.4% cases followed by tongue and 89% cases were suffering from moderately differentiated carcinoma (Grade-II).

Asif et al., 2020 carried out this research study at Liaquat College of Medicine and Dentistry, Karachi. Comprising of total 60 participants. 35 males and 25 females. The mean age of participants was 50.87 years. Most of the cases belonged to lower middle class and 54% suffered from unemployment. Buccal mucosa was found to be the most common site of tumor in 51.67% of patients. Frequently reported risk factor was betel nut and betel quid chewing around 43.45% of total included subjects. Moderately differentiated carcinoma (Grade II) was found in 50% cases.

Anwar et al., 2020 performed study at Aga khan University Hospital (AKUH) Karachi. Included total 146 cases of OSCC, 149 males and 37 females. Mean age of cases was 47.6 years. The maximum number of cases over 30.1% were laborer. The most common risk factor was habit of betel nut chewing in any form around 77.4%. The frequent site of lesion was buccal mucosa and highest number about 79% patient diagnosed with poorly differentiated carcinoma (Grade-III).

Khalid et al., 2019 conducted their research at Post Graduate Medical Institute, Lahore. Covering total 71 patients of OSCC. 46 males and 25 females. Mean age of patients was 50 years. Highest number of the cases belonged to lower middle-class category. Frequently noted risk factor was tobacco chewing 54.1%. More often reported site of lesion was oral mucosa 42% cases. 43.66% cases were diagnosed as moderately differentiated carcinoma (Grade II).

Ahmed et al., 2019 carried out this research study at the Institute of Radiotherapy and Nuclear Medicine, Peshawar, Pakistan. Comprising of total 60 participants. 341 males and 210 females. The mean age of participants was 55.0 years. Most of the cases belonged to lower middle class and 54% suffered from unemployment. Buccal mucosa was found to be the most common site of tumor in 61% of patients. Frequently reported risk factor was smokeless tobacco around 72% of total included subjects. Moderately differentiated carcinoma (Grade II) was found in 52% cases.

Mahmood et al., 2018 conducted their work at Ziauddin University Hospital (ZUH), Karachi. Involved 115 subjects. 82 males and 33 females. Mean age of subjects was 45.6 years. Excessive number of subjects belonged to lower socioeconomic class. Commonest risk factor was reported to be smokeless tobacco and betel nut. Buccal mucosa was the frequently observed site of cancerous lesion. 60.6% cases were suffering from moderately differentiated carcinoma (Grade II).

Sahaf et al., 2017 worked for their research study at three (Mayo hospital, Sheikh Zaid Hospital and AllamaIqbal Medical College/ Jinnah Hospital) tertiary care hospitals at Lahore. They included 89 patients. 52 males and 37 females. The mean age of total included population was 53.13 years. Most of the participants belonged to lower to middle socioeconomic class. The highest number about 33.7% patients reported idiopathic etiology followed by smoking 22.5%. Highly reported site of oral lesion was tongue in 37.0% patients. There was no comment found on the grading of OSCC.

Mirza et al., 2016 undertook their research work at Hamdard University Dental Hospital, Karachi by incorporating 80 cases, 53 males and 27 females. The mean age of the total cases was 42.12 years. Commonly mentioned risk factor was betel nut chewing. Most observed site of lesion was hard palate with alveolar mucosa. Moderately differentiated carcinoma (Grade II) was noted in highest number of 44.3%.

Despite the high the prevalence of this oral pathology there is lot of lacunae regarding prevention, control, early diagnosis, and appropriate treatment plan. The histomorphological parameters and other diagnostic tool with TNM staging on time can prevent the pathology and increases the survival rate of the patient. Oral hygiene and public awareness program can be the better step towards the prevention and control of the oral cancer. Our study will provide the platform for future research in local territory as well as at international level to make better health care programs.

| Studies            | Region      | Male/Female | MCSL       | MCRF      | Grade |
|--------------------|-------------|-------------|------------|-----------|-------|
| Abidi et al., 2020 | Karachi     | 110/30      | Buccal Mucosa | Tobacco   | II    |
| Asif et al., 2020  | Karachi     | 35/25       | Buccal Mucosa | Betel Nut | II    |
| Anwar et al., 2020 | Lahore      | 149/37      | Buccal Mucosa | Betel Nut | III   |
| Khalid et al., 2019| Lahore      | 46/25       | Buccal Mucosa | Tobacco   | II    |
| Ahmed et al., 2019 | Peshawar    | 341/210     | Buccal Mucosa | Tobacco   | NC    |
| Mahmood et al., 2018| Karachi    | 53/27       | Hard Palate | Betel Nut | II    |
| Sahaf et al., 2017 | Lahore      | 52/37       | NC         | Idiopathic | NC   |
| Mirza et al., 2016 | Karachi     | 53/27       | Hard Palate | Betel Nut | II    |

NC : No Comments
MCSL : Most Common Site of Lesion
MCRF : Most Common Risk Factor
Conclusion

We conclude that OSCC is the highly prevalent oral pathology in Pakistan with male preponderance. Most common causative agent is betel nut followed by tobacco and Grade-II carcinoma is highly prevalent oral cancer in our population. This research area demands the special attention due to its high prevalence and low survival rate. However due to scarcity of local literature regarding OSCC we were not able to cover major population of Pakistan.

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