Original Article

Epidemiology of Squamous Cell Carcinoma in Response to Different Hazardous Chewing Causes in Lahore, Pakistan-a Unicenter study

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Abstract:

Oral squamous cell carcinoma (OSCC) being the world's most prevailing and frightening cancerous disorder lacks the sufficient data in Pakistan despite of its higher magnitude and prevalence. **Objective:** This study was specifically designed and conducted with the aim to identify the frequency of this disorder along with causative factors in past three years in a tertiary care hospital of Lahore, Pakistan. **Methods:** Epidemiological study was conducted using retrospective randomized method and all pre-requisites were filled. The clinical profiles of patients were collected from Maxillofacial and Oral Surgery Department of Pathology, Mayo Hospital Lahore. Patients who had undergone treatment for OSCC were contacted and interviewed for information about demographic regions, previous history of malignancy, disease onset, chewing habits, exposure to pesticides, industrial exposure to metals etc. and all particulars were not and compiled on questionnaire. **Results:** A total of 54 patients from different districts of Punjab participated in the study. Percentages for each possible causative chewing habit were calculated and 87.50 % of population was found addicted to different habits. Genetic factor might have contributed in remaining for development of OSCC. **Conclusions:** Informative data provided in this study will be helpful to be used by the government and private health agencies while designing and planning management of oral health problems and allocating health budgets in focusing this issue.

Key words: Oral squamous cell carcinoma, chewing habits, paan, sapari, naswar

Introduction:

Among all the cancers of head and neck, more than 95% is squamous cell carcinoma [1]. A momentous escalation rate has been seen in squamous cell carcinoma during the last 30 years. Highest rates have been observed in India, Brazil, Pakistan and France in an epidemiological study conducted by International Agency for Research on Cancer [2, 3]. OSCC occurs predominantly in patients having long term exposure of tobacco and/ or alcohol. Anatomically squamous cells are being converted into cancerous form involving floor of mouth or on lateral and ventral surface of the oral mucosa including tongue. Initially this cancer is asymptomatic so early diagnosis is needed i.e. screening so that malignancy may be avoided in future. After screening treatment is carried out, surgery is done which gives survival rate of 5 years. Majority of the soft oral lesions develops epithelial neoplasia and other types depending upon anatomical location, tumor type and pattern of metastasis and may appear as fibrous hyperplasia, pyogenic granulomas and squamous cell carcinomas [4, 5].

OSCC comes under cancers of skin, and, is one of the most common cancers and develops due to mutation of lips and mouth cells. These mutations cause the cells to grow and divide in

rapid manner. Lesions are rarely symptomatic but with time they have tendency to spread to other regions of the mouth. OSCC can be formed in any area of mouth including tongue, cheek, gums or palate. Everyday sun exposure may also be a menace for lip cancer. Symptoms for oral squamous cell carcinoma include: mouth sore, loose teeth, white or red patches in mouth, bleeding mouth, pain in swallowing, lump in neck etc. [6].

In a demographic study in 2012 oral cancers were postulated among top ten leading cancers in the world [7]. In 2012 research on gingival squamous cell carcinoma was conducted on the basis of diagnostic impediment and found that 90% cases of oral squamous cell carcinoma were reported in people older than 45 years [8]. On the contrary, another study with larger patient population belonging to Germany ended showing highest incidence of oral cancers among 30-39 years of age, and, most of those involved floor of the mouth than the oropharynx [9]. In a retrospective study from 1894-2011, pediatric OSCC was analyzed to verify the main risk factors of OSCC occurrence in pediatric patients. Researchers reported that standardized examination of the child's oral cavity is the first stage to diagnose OSCC, especially when systemic predisposing diseases such as xerodermapigmentosum, fanconi's anemia, epidermolysisbullosa and juvenile papillomatosis are present [10].

Causative factors for 95 % for oral Squamous cell carcinoma are tobacco (cigarettes, cigars, pipes, and smokeless tobacco) and alcohol. Chief risk factor is smoking (2packs/day). Other risk factors for OSCC include chewing betel nuts, HPV infection, chronic irritation, poor dental and oral hygiene and immunosuppressive medicines [6]. Mansoor AK et al., in 2012 in Karachi, Pakistan discussed development of OSCC in response to various chewing habits in population of Karachi. Paan (betel quid), chaliya (areca nut), gutka, raw tobacco (chaliya), manpuri and naswar are common chewing habits in old people as well as in young generation. They selected 170 patients from the general populations and study concluded that all these habits cause OSCC within 5-10 years of exposure time [11]. Certain long term medication may also prove to be a predisposing factor to cause oral cancer as azathiopurine in Crohn's disease has a proven history for such happening [12].

The first step in the diagnosis of oral cancer is made through soft issue examination. Further confirmation of a suspected lesion is done through biopsy and histological examination. Along with physical examination and biopsy, supplementary diagnosis can be made through endoscopy, resonance imaging, computed tomography scan, ex-foliative cytology and positron emission tomography depending upon type and grade of tumor. Early detection of OSCC is important as it can be treated more successfully. The selection of treatment technique and choice of regimen depends upon type, size, grade and location of tumor and these may include; surgery, biopsy, chemotherapy, radiation therapy and/ or targeted therapy. Treatment for oral cancer depends on its location and stage. Combination therapies are employed sometimes to combat recurrence [13-15].

Long term epidemiological study in Pakistan is not possible due to insufficient registration of cancer cases at national level. Although data is available for the recent incidence of head and neck squamous cell carcinoma (HNSCC) at localized areas in Pakistan which indicate that HNSCC is the most common of all the malignancies [16]. This study was aimed to check the magnitude of oral squamous cell carcinoma in Punjab province of Pakistan. In diagnosed patients the pattern of chewing habits was observed to see prevailing trend of potential cause and also the anatomical location mostly involved in such cases.

Methods:

For conducting this randomized retrospective epidemiological study, the patients who had undergone treatment from Department of Pathology and Oral & Maxillofacial Surgery, Mayo Hospital Lahore, for oral squamous cell

carcinoma were contacted and recruited for the study. Case files of the OSCC patients suffering from other concomitant disorders were excluded. Consent forms were filled and signed by participants and all disease information regarding demographic regions of the patients, previous history of malignancy, disease onset, habit of smoking, bidi, huqqa, pan, alcohol, exposure to pesticides, wood dust, industrial exposure to metals and dietary habits were collected. Further, their conducted diagnostic parameters and prescribed medications were also noted. The diagnostic reports were also accessed and tumor grading and anatomical locations were noted with the assistance of consultant histopathologist. Type of anesthesia prior to surgery and major complications during surgery were also recorded for patients who had undergone surgery. The collected information was analyzed using excel sheet formulae.

Results:

Patients belonged to different cities of Punjab, maximum patients (26%) were belonging to Lahore (Figure 1). A questionnaire was generated for getting all possible information. Combined effects of tobacco, smoking and paan etc. were recorded for evaluating risks. Percentages for each causative chewing habit were calculated. Among all patients 87.50 % patients were addicted to different habits. i.e. smoking (23.07%) and some chewing habits of paan (8.65%), sapari (2.88%) and naswar (16.34%), and, some patients were found to be addicted of combination of these factors like (smoking and paan 2.88%) , (smoking and naswar 18.26%) , (smoking and sapari 3.84%), (paan and naswar 4.80%) and (paan and sapari 6.73%) (Figure 2). Smoking (23.07%) was observed to be the main etiological factor for OSCC (Figure 2). Agewise distribution of study patients shows that range was 21-75 years, with maximum patients in the age group 36-40 years (Figure 3). Anatomical sites for OSCC varied among patients, with majority of the patients having cheeks (26%) as the site of carcinoma, while others had tongue (21%), maxillary sinus (15%) and mandible (7%)(Figure 4).

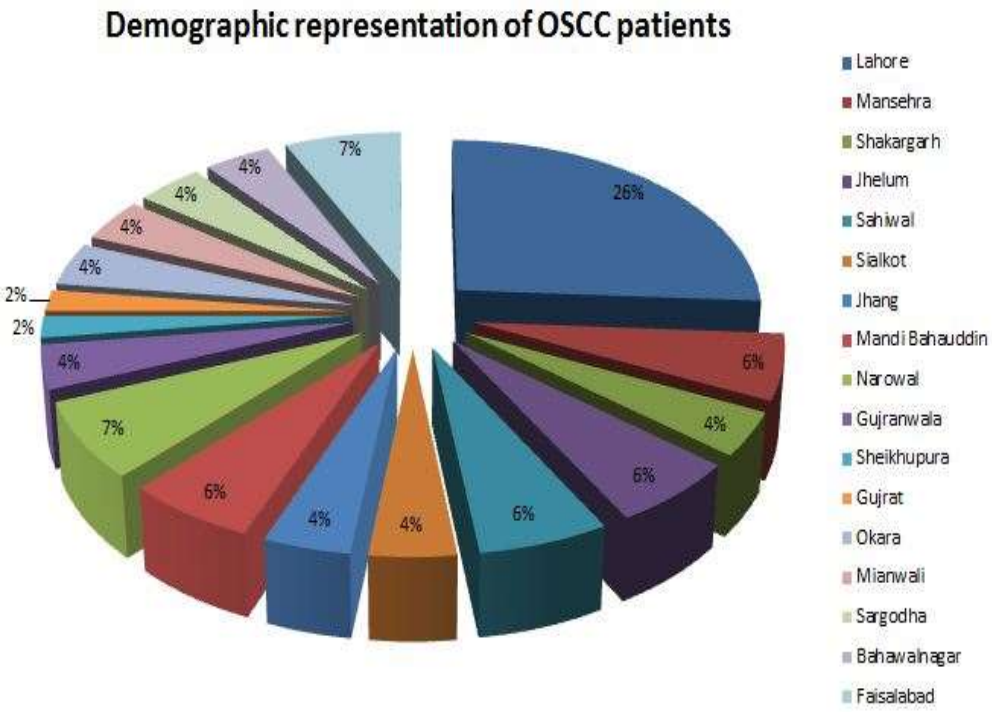

Figure 1: Demographic data of all patients who participated in this study from different districts of Punjab

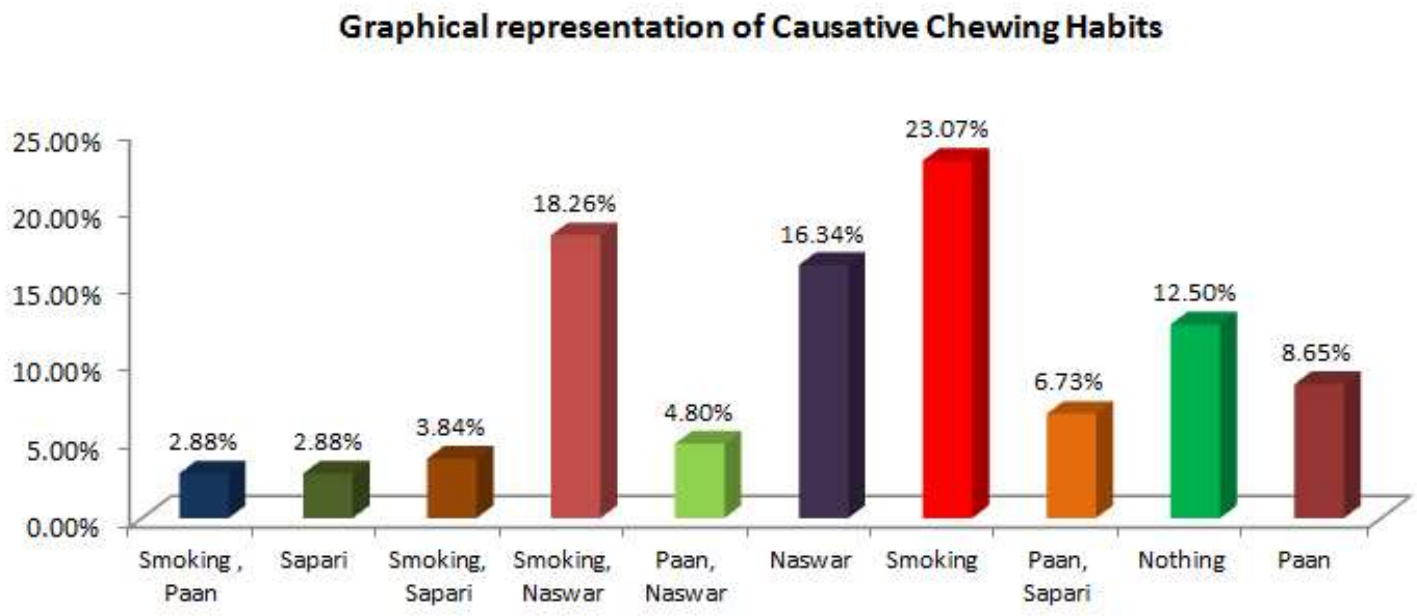

Figure 2: All causative factors of OSCC are shown alone and in combination

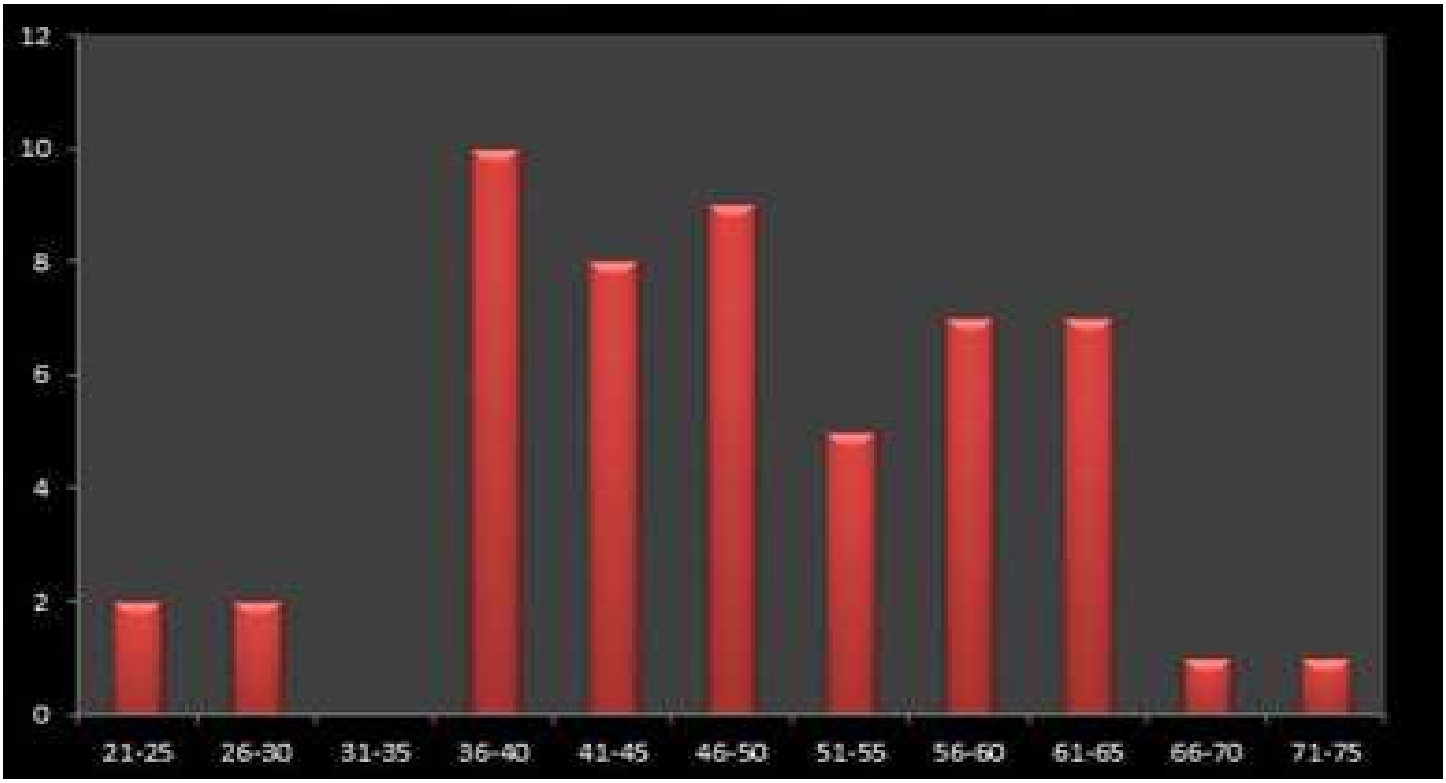

Figure 3: Age-wise distribution of patients

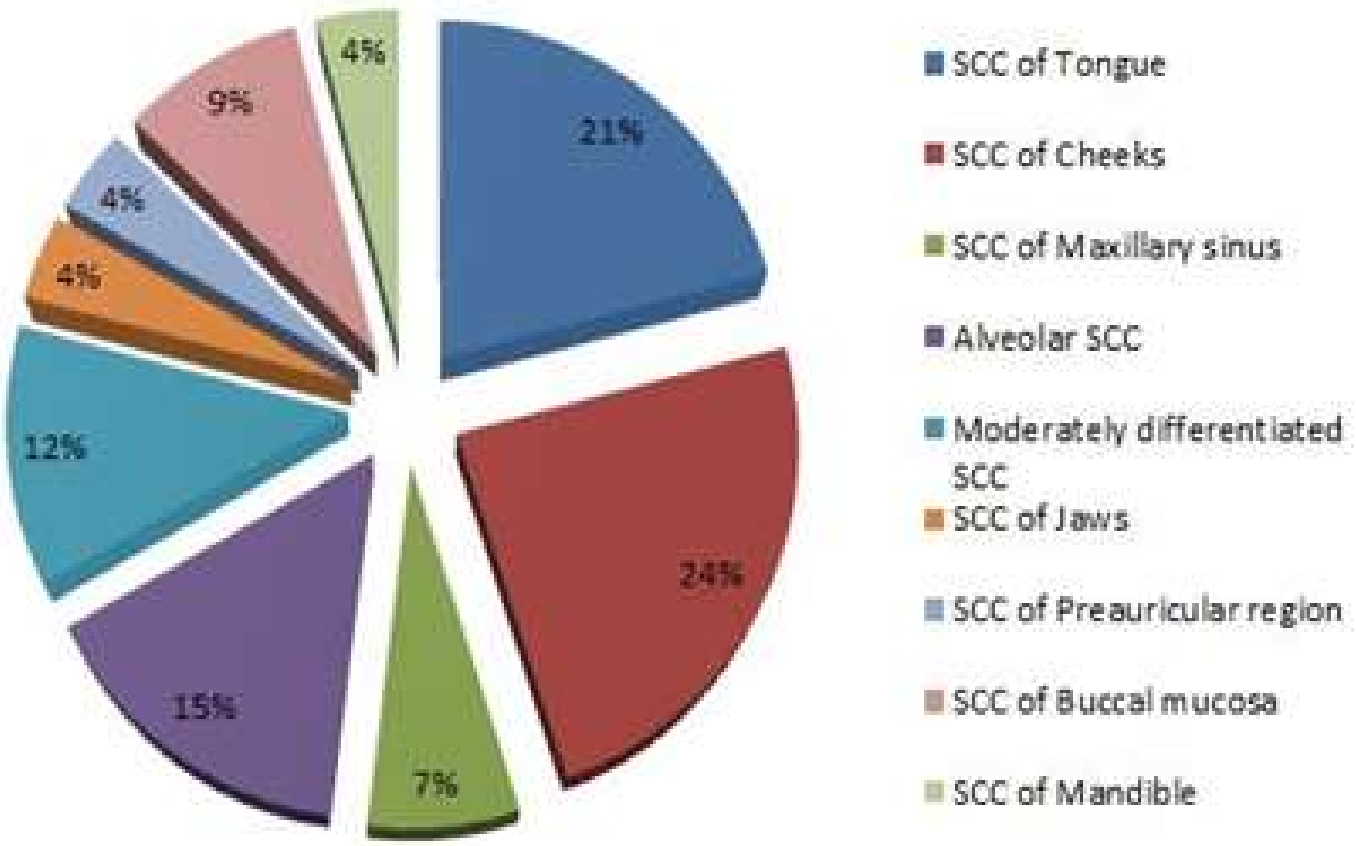

Figure 4: Diagnosis of OSCC on the basis of affected anatomical regions

Discussion:

Oral squamous cell carcinoma is the world's most prevailing and alarming cancerous disorder. Primarily it was found that elderly men are mostly affected by this disease due to tobacco and excessive use of alcohol as the most prevalent risk factors [17]. However, some studies also show a higher incidence rate of OSCC amid young patients less than 40 years of age[1819]. OSCC has a significant occurrence around the globe and a reasonably arduous projection, urging advance analyses on possible factors that might be helpful in combating the disease.

In the current study, the effects of different chewing elements were observed and smoking was found to be the leading factor in progression of OSCC with percentage of 23.07 %. Naswar was second main cause with 16.34 %. Paan and Sapari were responsible for 8.65 % and 2.88 % of cases respectively. The combined effects of detrimental causes were also recorded and their percentages were checked. Combined effects of chewing habits found to be the highest leading cause of occurrence and progression of OSCC. Toxic effects of differential components of these causes are very disastrous which we already have discussed. Smoking has been previously reported as an etiological factor for OSCC [20].

Personalized medicine and precision medicine should be a new focus for diagnostic and therapeutic strategy for OSCC [21]. Genetic studies [22] and HPV sceening [23] may also be conducted to better diagnose and evaluate the prognosis for better treatment. OSCC is characterized by high mutation rate as in other head and neck squamous cell carcinomas,, neoantigens are produced, suggestive of the fact that immunotherapies may be effective in this regard [24]. Awareness regarding substance

abuse may be created through electronic media, social media, print media, seminars, lectures in educational institutes etc. These prevention strategies may help in management and control of this carcinoma to greater extent.

Conclusions:

OSCC has become a frequent disease in Lahore and more young patients are affected due to increased substance abuse and smoking.

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