

## Hematological Presentation of Oral Squamous Cell Carcinoma Patients

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### Abstract

**Background:** Oral squamous cell carcinoma is highly prevalent in South Asian countries as a major global health problem. It may affect any age group and gender depending upon the risk factors. According to observation, it is more prevalent in people with low socioeconomic status especially in developing nations. Such study will be the first on Hematological presentation Oral Squamous Cell Carcinoma patients in Pakistan.

**Objectives:** To investigate the haematological profile of oral squamous cell carcinoma patients and also demonstrate the incidences of oral squamous cell carcinoma.

**Methodology:** Cross-sectional prospective pilot study was done in Oral and Maxillofacial Surgery Department, Mayo Hospital, and Lahore. Seventy patients were interviewed during the period of January 2018 - October 2018. Simple random sampling was performed. The data obtained was subjected to descriptive statistical analysis using SPSS version 21. Qualitative variables like age was presented in mean  $\pm$  SD. For blood analysis, One-Sample Kolmogorov-Smirnov Test was applied.

**Results:** Oral Squamous Cell Carcinoma was frequently occur in females with ratio of 60% (n = 42) and less frequent in males with the ratio of 40% (n = 28). In Oral squamous cell carcinoma, the mean age of the patients was 43.89 and SD was 11.242. In Oral squamous cell carcinoma, the mean age of the patients was 43.89 and SD was 11.242. According to analysis, minimum value of Hb is 7.0 for female and 8.0 for male while maximum value is 14.4 for both male and female with 11.25 mean  $\pm$  1.63 SD in male and 10.77 mean  $\pm$  1.71 SD in females.

**Conclusion:** It is concluded that among different hematological parameters Hb%, MCHC, MCV are remarkably amended in OSCC. Although RBC count is not altered, nutritional anemia is found to be most foremost finding in OSCC patients. Incidence of OSCC are most frequently present in females than males.

**Keywords:** Oral Squamous Cell Carcinoma; Hematological Profile; Incidence

### Introduction

According to World Health Organization (WHO), oral squamous cell carcinoma (OSCC) is the eighth most commonly occurring cancer around the world. It presents a challenging situation for developing countries [1]. Pakistan is contemplated to be the 7<sup>th</sup> most favoured country in the world for the preponderance cases of oral malignancies [2]. Above 90% cases emerge from oral epithelium. So, 10% cases embrace of melanoma, malignant salivary gland tumors, and lymphoma and odontogenic tumors of the jaw [3].

The diagnostic stage of tumor has high influence on survival rate [4]. OSCC survival rate is highly depend on gender, age group, amount of tobacco and betel consumption which are more influencing factors prevalent in people with low socioeconomic status.

Epidemiological studies have shown a male preponderance of OSCC with female with a ratio of 2:1 [5]. The etiology of OSCC depends upon multiple factors but prime factors are chewing of areca nut, tobacco intake in various forms and alcohol abuse. Nutritional deficien-

cies, environmental causes, chronic trauma and exposure to radiation are other contributing factors. Oral lichen planus and oral Submucous fibrosis (OSF) are the conditions which are found to be associated with increased risk of developing oral cancer.

Oncogenes also play important role in etiopathogenesis of head and neck cancer [1]. According to the prediction of World Health Organization, incidences of squamous cell carcinoma are increased into the next several decades [5]. The overall five year survival rate is around 50% for this group [6]. Mostly the patients come here are anemic. As various substances alter quantitatively in the serum during tumor development, we intended to explore the changes in the haematological profile in oral squamous cell carcinoma (OSCC). The purpose of this research is to investigate the haematological profile of oral squamous cell carcinoma patients. Moreover, such study will be the first on OSCC patients in Pakistan.

**Materials and Methods**

Cross-sectional prospective pilot study was done in Oral and Maxillofacial Surgery Department, Mayo Hospital, and Lahore. Seventy patients were interviewed during the period of January 2018 - October 2018. Simple random sampling was performed. Before carrying the research, approval of institutional review board has been taken. Clinical and histopathological examination was done to diagnose or confirm the presence of OSCC. Every patient was informed by consent form before participating in the study. A specific developed proforma was designed and filled by researcher to be filled after written consent of the patient. Patients were interviewed.

Blood samples were collected intravenously of all 70 subjects. The blood test for Hb, hematocrit, RBC count, MCV, MCH, MCHC, and total leukocyte count (TLC), lymphocytes and platelet count were done in autoanalyser machine in the pathological department of King Edward Medical University, Mayo Hospital Lahore. The erythrocyte Count (RBC), haemoglobin (Hb), hematocrit, MCV, MCH, MCHC and total leukocyte count (TLC), lymphocytes and platelet count were measured. The patients with muscle dystrophy, diabetes, renal, cardiac or hepatic diseases, post-operative patients, treated with chemotherapy and radiotherapy and previous history of cancer or malignancy treatment were excluded from the study. Patients with biopsy proven oral squamous cell carcinoma and pre-operative patients without any transfusion at the time of presentation were included in this study.

The following variables were studied: Patient’s demographics, diagnosis, anatomical location, gender distribution, and hematological profile. The data obtained was subjected to descriptive statistical analysis using SPSS version 21. Qualitative variables like age was presented in mean ± SD. For blood analysis, One-Sample Kolmogorov-Smirnov Test was applied.

**Results**

Seventy patients were analyzed in this Cross-sectional study. Incidence of Oral Squamous Cell Carcinoma were frequently occur in females with ratio of 60% (n = 42) and less frequent in males with the ratio of 40% (n = 28). In Oral squamous cell carcinoma, the mean age of the patients was 43.89 and SD was 11.242. Out of 70 subjects, 65 (92.9%) subjects were belonging to poor families while 5/70 (7.1%) were belonging to middle families. 25.7% patients were having complaint of limited mouth opening, 7.1% were having complaint of pain and 37.1% were having chewing problems. About 72.9% cases were showing poor oral hygiene while 4.3% were show good oral health with oral squamous cell carcinoma.

One-Sample Kolmogorov-Smirnov Test results were announced that haemoglobin distribution is normal with mean 10.96 and standard deviation 1.69. MCH distribution is normal with mean 25.35 and standard deviation 3.93 and Platelet distribution is normal with mean 210.35 and standard deviation 144.23 shown in table 1.

Null Hypothesis	Sig.	Decision
Age distribution is normal with mean 43.89 and standard deviation 11.24.	0.54	Retain the null hypothesis
Haemoglobin distribution is normal with mean 10.96 and standard deviation 1.69.	0.23	Retain the null hypothesis
MCH distribution is normal with mean 25.35 and standard deviation 3.93.	0.218	Retain the null hypothesis
Platelet distribution is normal with mean 210.35 and standard deviation 144.23.	0.113	Retain the null hypothesis

**Table 1:** One-sample Kolmogorov-Smirnov test results.

According to analysis, minimum value of Hb is 7.0 for female and 8.0 for male while maximum value is 14.4 for both male and female with 11.25 mean  $\pm$  1.63 SD in male and 10.77 mean  $\pm$  1.71 SD in females. Minimum value of RBC is 3.00 for female and 2.90 for male while max. Value is 5.50 for both male and female with 4.16 mean  $\pm$  0.71 SD in male and 4.23 mean  $\pm$  0.73 SD in females details have shown in table 2.

Variables	Number (n = 70)		Minimum value		Maximum value		Mean		Std. Deviation	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Hemoglobin	28	42	8.0	7.0	14.4	14.4	11.25	10.77	1.63	1.71
RBC	28	42	3.00	2.90	5.50	5.50	4.16	4.23	0.71	0.73
HCT	28	42	29.05	29.05	44.60	44.60	37.92	37.60	4.42	3.02
MCV	28	42	54.00	8.20	97.40	97.40	80.92	72.76	12.57	26.52
MCH	28	42	17.00	17.00	31.20	31.20	25.38	25.32	4.46	3.59
MCHC	28	42	28	28	34	34	31.24	31.14	1.53	1.39
Lymphocytes	24	37	1.27	1.27	38.70	38.70	18.71	23.30	14.49	13.68
Platelets	22	34	17.90	2.50	407.00	407.0	272.1	170.3	127.2	142.0

**Table 2:** Descriptive statistical analysis (T-test) results.

Hb: Haemoglobin; HCT: Hematocrit; MCV: Mean Corpuscular Volume; MCH: Mean Corpuscular Hemoglobin; MCHC: Mean Corpuscular Hemoglobin Concentration; RBC: Red Blood Cells.

## Discussion

Oral squamous cell carcinoma occurs worldwide but highly prevalent in South Asian countries [1]. The previous findings indicated increased frequency in males than females [7]. Several studies have been conducted locally. So, their findings are in accordance with other studies [8]. A study conducted in Brazil also showed male preponderance [2]. One of the research conducted in Nova Scotia that extended over a 15 year period reported 57 males 20 females' cases of OSCC [9].

Similarly, research conducted (over a seven year period) in Scandinavian countries showed increased prevalence of tongue cancer in male population whereas, females affected by the disease were lesser than men and even though the incidence increased it didn't change by much [10]. Infact all studies conducted locally in Pakistan showed an increased incidence of OSCC in males [2,11-14].

The present study findings showed increased frequency of OSCC in males with ratio of 60% (42/70) as compared to females with the ratio of 40% (28/70) and present study is quite different than previous ones. In South Asian Countries, there are a high number of OSCC patients suffering from anemia belonging to a low socioeconomic background with nutritional deficiencies [15].

Anemia is known to influence prognosis of OSCC patients, but how anemia and epithelial precursor lesions influences each other is not clear. Chronic diseases are a major cause of anemia. Therefore, Oral Squamous Cell Carcinoma is very closely related to anemia. Nutritional deficiency, impaired oral intake and low-socio-economic condition in OSCC are also a main contributing factor for anemia. A lower platelet count was seen in 25.8% in cases of OSCC in the study of Bhattacharjee A, Ratna F, *et al* [15]. Previous study was conducted in India (2015) and its finding shows the 4.5 mean  $\pm$  .9 SD for RBC, 38.3 mean  $\pm$  11.1 SD for HCT, 83.1 mean  $\pm$  18.2 SD for MCV, 26.7 mean  $\pm$  5.1 SD for MCH, 29.2 mean  $\pm$  3.6 SD for MCHC, 161.5 mean  $\pm$  42.6 SD for platelet and 11.1 mean  $\pm$  1.8 SD for Hb% while present study shows deviation in mean and SD according to previous results.

So, People coming in Mayo Hospital are mostly from peripheries and belong to low socioeconomic background. Most of the patients are malnourished and which leads to anemia. Oral Squamous Cell Carcinoma causes many systemic changes in body also including blood related changes. Blood efficiency to carry oxygen may decrease and it is also fall in the category of the blood changes. When patients have OSSC, food intake will decrease that causes Hemoglobin rate will decrease, and immunity of patient's body will also decrease and result in

increase of total leucocyte count as mentioned in results. By comparing this study to other studies it has been seen that OSCC has remarkable effects on anemia. So, it is suggested that the patients with OSCC should improve their diet to prevent from anemia and they need complete evaluation for definite treatment to prevent from incidences of OSCC.

The sample size and sampling strategy are the methodological strength of present study. The non-availability of comparable study instrument, sample consists of people from Lahore that does not represent the entire population of Pakistan are the limitations of present study.

In Pakistan, the incidence of Oral Squamous Cell Carcinoma has risen because of consumption of gutka, tobacco related products and niswar. So, there is need to inform the masses about the detrimental effects of these products. Government strict actions are needed to limitize the availability of these products. A cost effective and reliable community based screening program should be instituted to reduce the burden of OSSC in the developing nations. There is need to spread awareness among the general public to reverse this rising trend.

### Conclusion

It is concluded that among different hematological parameters Hb%, MCHC, MCV are remarkably amended in OSCC. Although RBC count is not altered. Nutritional anemia is found to be most prominent finding in OSCC patients. We suggest that these parameters should be considered collectively during evaluation of OSCC patients. The variations in these parameters may be useful in treatment progress. It also has been conducted that OSCC patients coming in Mayo Hospital, Lahore are mostly anemic.

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### Disclaimer

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### Conflict of Interest

Nil.

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