

## Serum vitamin D levels of Oral squamous cell carcinoma patients of KPK

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### ABSTRACT

#### Objective

The objective of this study is to estimate serum levels of vitamin D in oral squamous cell carcinoma cases.

#### Methodology

It was a multicenter study conducted at the Department of Pathology, Peshawar Medical College (PMC) and Prime Teaching Hospital. The specimens were collected from Department of Oral Pathology; Peshawar Dental College (PDC), Institute of Radiotherapy and Nuclear Medicine (IRNUM), Peshawar; Khyber College of Dentistry (KCD), Peshawar; Bacha Khan Dental College, Mardan. The study consisted of 60 diagnosed cases of OSCC. Blood samples were collected from all 60 participants. Serum vitamin D levels were estimated by Electro-chemiluminescence Immunoassay. The data then was statistically analyzed by Statistical Package for the Social Sciences (SPSS) version 20. The statistical differences between the two groups was calculated by using *student t* test. Statistical significance was determined at *p* value  $\leq 0.05$ .

#### Results

The mean age was 50.27 years with a male to female ratio 2:3. In the oral squamous cell carcinoma patients (n=60), all the participants were deficient in vitamin D with vitamin D levels  $\leq 20$  ng/ml. Mean serum vitamin D level was 10.78ng/ml, among these 24 were males and 36 were females.

#### Conclusion

Our study showed deficiency of serum vitamin D in all the cases of OSCC patients

**Key words:** Vitamin D, Oral squamous cell carcinoma, oral cancers, serum levels

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### INTRODUCTION

Oral cancer constitutes a significant component of the global cancer burden. About 58% of these cases occur in South Asia and South east Asian region. Oral carcinoma is the second commonest malignancy affecting males and females in Pakistan and is the second leading cause of cancer related deaths in the country. The commonest histopathological variant is oral squamous cell carcinoma making 90-95% of all oral cancer. Vitamin D is recognized as "the sunshine vitamin". Unfortunately, intake of vitamin D is taken for granted. Very few foods are fortified with vitamin D but it is assumed to be plentiful in a healthy diet. A number of population-based studies have shown that low serum levels of vitamin D are linked with significant increase in cancer risk, more specifically with the development of oropharyngeal carcinoma.<sup>2-5</sup>

The anti-neoplastic activities of vitamin D are due to its property

of induction of apoptosis, anti-inflammatory, anti-proliferative and pro-differentiating actions on malignant cell, inhibition of invasiveness of tumor and tumor angiogenesis. These wide ranging anti neoplastic actions of vitamin D provides a base for its potential use in chemoprevention and therapy of OSCC.<sup>5-9</sup> Hence before starting the chemotherapeutic treatment of OSCC, estimation of patient's serum levels of vitamin D will be highly valuable in getting the desired results by adding vitamin D as an additional therapeutic factor. The present study is designed to detect the serum levels of vitamin D in OSCC patients of KPK.

### METHODOLOGY

#### Design of the study

This cross-sectional research was conducted at Peshawar Medical College and Peshawar Dental College, Khyber College of Dentistry Prime Teaching Hospital, Bacha Khan Dental College, and Institute

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of Radiotherapy and Nuclear Medicine (IRNUM), Peshawar from April 2017 to September 2017.

### Sample

The study group consisted of 60 squamous cell carcinoma cases. Consecutive sampling technique was adopted and subjects were selected from outdoor patient departments of the above listed centers.

Already diagnosed cases of oral squamous cell carcinoma with no history of tobacco use, irrespective of age and sex were included in the study. Individuals with severe kidney or hepatic dysfunction, taking radiotherapy, treated oral squamous cell carcinoma patients, taking vitamin D supplements and therapy, Individuals with history of Alcohol or tobacco use and Pregnant or lactating women were excluded from the study.

Detailed history of the patients was recorded on a pre-structured Proforma. The Proforma included name, age, gender, address, history of present disease (OSCC), history of tobacco use and vitamin D intake. It also included socio-economic status and family history of oral cancer.

The findings of general physical examination of patient, local examination of lesion and status of regional lymph nodes were also recorded. Serum vitamin D levels were entered in the Proforma after their estimation.

### Assessment

Detailed history of subjects was recorded on a pre-structured Proforma. The Proforma for oral squamous cell carcinoma cases included name, age, gender, address, history of present disease (OSCC), history of tobacco use and vitamin D intake. It also included socioeconomic status and family history of oral cancer. The findings of general physical examination of patient, local examination of lesion and status of regional lymph nodes were also recorded. Serum vitamin D levels were entered in the Proforma after their estimation.

### Procedure

Under sterile conditions, 4ml of venous blood was taken from the cubital fossa. For research, it was collected in gel tubes. To obtain clear serum, samples were centrifuged at 4000 rpm for 5 minutes. Serum was then aliquoted and maintained between 2 and 8 degrees Celsius until analysis.

Serum vitamin D levels were measured by electrochemiluminescence immunoassay (ECLIA) technique using the Elecsys Vitamin D Total Kit (Lot No: 23900704, catalog no:05894921190 V3, Roche Diagnostics, Germany). The test results were given in ng/ml. Vitamin D reference ranges were established according to Holick, 2009; Krasowski, 2011; Souberbielle et al., 2010). The procedure for measuring serum vitamin D levels was performed according to the kit manufacturer's recommendation.

### Data analysis

In the present study statistical analysis was conducted using the statistical package for social sciences (SPSS) version 20. Statistical results were given as mean and standard deviation for age, gender, the frequency and percentages for sites of oral cancer involvement, histopathological grading of OSCC were calculated,

serum vitamin D ranges and serum vitamin D levels in a cases of OSCC patients were identified.

## RESULTS

This was cross sectional study consisting of in 60 oral squamous cell carcinoma cases. Overall age of the participants ranged from 20 - 80 years. The mean age was 50.27 with SD 9.45 years with a male to female ratio 2:3. The participant's age were categorized into ten-year band from age 20 to 80 plus onwards.<sup>10</sup>

The commonest primary site of development of oral squamous cell carcinoma among group A was buccal mucosa in 40% cases(n=24/60). It was followed by tongue in 26.7% cases(n=16/60). The third common site of development of carcinoma was labial mucosa and gingiva (13.3%, n=8/60 each) while lower-lip;6.7%, n=4/60; was the least common site of development of OSCC (table1).

Site of lesion	Frequency(n=60)	Percentage
Buccal mucosa	24	40.0%
Labial mucosa	8	13.3%
Lower lip	4	6.7%
Gingiva	8	13.3%
Tongue	16	26.7%
<b>Total</b>	<b>60</b>	<b>100%</b>

**Table-1: Sites of development of oral squamous cell carcinoma among cases.**

The histopathological grading of the OSCC patients showed that the moderate differentiated OSCC was the most common finding (53.3%) among all the cases followed by well-differentiated (40%) and then poorly differentiated (6.7%) OSCC cases. (Table 2)

Histological Grade	Frequency (n=60)	Percentage
Well differentiated squamous cell carcinoma	24	40.0%
Moderately differentiated squamous cell carcinoma	32	53.3%
Poorly differentiated squamous cell carcinoma	4	6.7%
<b>Total</b>	<b>60</b>	<b>100%</b>

**Table-2: Histopathological grades among squamous cell carcinoma cases.**

In the study population, all OSCC cases (n=60/60; 100%) had vitamin D deficiency with a mean and SD of 10.78 ng/mL. The most common age group was 40-49 years. A statistical comparison between the serum vitamin D levels and the subjects' age groups resulted in a p-value of 0.52, which is not significant.

In the study population, all the patients with oral squamous cell carcinoma (n=60) were vitamin D deficient. The mean serum vitamin D level was 10.78 ng/ml, including 12 men and 18 women.

The most common age group was 40-49 years. A statistical comparison between serum levels of vitamin D in male and female subjects using Student's t- test yielded a p-value of 0.26, which is non-significant. (Table 3)

Age Ranges								
	20-29	30-39	40-49	50-59	60-69	70-79	80+	p-value
Serum Vitamin-D levels Of OSCC ( $\leq 20$ ng/mL)	8	4	14	12	14	6	2	0.79

**Table 3: p-value for mean and standard deviation of serum vitamin D levels in cases and their age groups.**

## DISCUSSION

The present study included estimation of serum vitamin D levels in oral squamous cell carcinoma cases with no history of tobacco or alcohol use. In literature published so far, no separate study of estimation of serum vitamin D levels in patients of OSCC without tobacco use has been found. In the present study, the mean age of cases of both genders included in our study is 50 years, which is similar to studies done by Begum N. et al and Halboub E et al this clearly shows that OSCC is a chronic illness mostly effecting elderly aged people.<sup>11-12</sup>

Our results showed increased female to male ratio among patients which is similar to the results of Patel et al.<sup>13</sup>

Regarding the site distribution and histological grade of squamous cell carcinoma, the results of our study are consistent with Minhas S. et al and Siegel RL. Et al, because the buccal mucosa is the most commonly involved site of OSCC initiation.<sup>1,14</sup>

The mean serum 25(OH) D levels of OSCC cases in our study was 10.78 ng/ml which presents deficient state and was similar to study done by Grimetal, measuring mean levels of 12.2 ng/ml in all OSCC patients, this shows that vitamin D might have therapeutic and antineoplastic role in OSCC.<sup>3,7</sup>

The present study showed statistically insignificant relationship between the age groups and serum levels of vitamin D levels in OSCC cases (p=0.52) which is similar to study done by Begum N. et al, this shows that vitamin D deficiency is more common in every age population despite its causative factors. However, in another study found higher vitamin D levels in patients 65years of age or older.<sup>11-12</sup>

Our study observed statistically insignificant relationship (p= 0.26) between serum vitamin D status and gender of OSCC cases, identical observation was made by author. In that study showed that older age and female sex, are all associated with an increased risk of being vitamin D deficient.<sup>13</sup>

### Limitations

The present study was time bound with a small sample. It is recommended that the role of vitamin D as an anti-cancer agent needs further exploration on larger sample involving randomized control trail.

## CONCLUSION

Our study observed statistically in-significant relation between serum vitamin D status with gender and age of OSCC cases. The moderately differentiated OSCC was predominated and frequent site of involvement was buccal mucosa. Overall serum 25(OH) D levels of OSCC cases in our study was found deficient.

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#### **CONFLICT OF INTEREST**

Author declared no conflict of interest

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