<u>ORIGINAL RESEARCH</u>

# Assessment of serum lipid profile in patients with oral cancer

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**ABSTRACT**
**Background**: This study was conducted to assess the serum lipid profile in patients with oral cancer. **Material and methods**: There were a total of 100 subjects in the study. In this investigation, subjects with oral cancer confirmed by histology as well as those without any underlying systemic illness were included. Subjects who were overweight or older than 65 were not allowed to participate in the study. The subjects were split into two groups of fifty each, one for each type of oral cancer and one for healthy ones. Fifty people without the condition made up Group 1, while fifty subjects with the disease made up Group 2. Descriptive statistics were employed in this study in order to reach findings. The results for categorical variables are shown as a percentage, and the findings for continuous variables are shown as mean SD (Min-Max).The results are deemed significant at the 5% level of significance. Analysis of variance is performed to compare research parameters among three or more patient groups; the Post hoc test according to Tukey is used to compare pairwise comparisons. The 3x3 Fisher exact test was used to assess the significance of categorical study parameters between two or more groups. The results are deemed significant at the 5% level of significance. **Results**: The study revealed that the oral cancer group had mean plasma triglyceride levels of 100.01 mg/dl and the control group had mean levels of 163.41 mg/dl. It was discovered that the malignant groups had mean plasma triglyceride levels that were lower than those of the control group. The mean plasma TC level was 136.77 mg/dl in the cancer group and 209.89 mg/dl in the non-cancer group. Compared to the control group, the precancerous and cancerous groups had considerably decreased plasma TC levels. **Conclusion**: The risk of oral cancer was inversely correlated with serum lipid profile. A decrease in serum lipid levels may be a precursor to changes occurring in cancerous cells, according to some data.
**Keywords**: oral cancer, lipid profile, triglycerides

## INTRODUCTION
Lipids are carried in our blood by specialized clusters of proteins and lipids known as lipoproteins, which get tangled up together. These are essential components of cell membranes, and they are necessary for both malignant and normal tissues' cell integrity as well as for cell growth and division. Triglycerides are the primary form of energy storage in the body (TGs). After being initially encapsulated in lipoproteins and carried by plasma, TGs and cholesterol are subsequently absorbed by cells and broken down for their own purposes. The emphasis of interest regarding cholesterol's potential role in the etiology of cancer has recently shifted to the recognized etiological factor of coronary heart disease.According to a number of writers, low cholesterol may be a risk factor for the development of cancer.[1,2]

Lipids are components of cell membranes that are necessary for many biological processes. Scholars have reported a link between serum lipids and several malignancies, despite their persistent key role in the development of cardiovascular disease.[3-5] Nevertheless, there aren't many reports on the plasma lipid profile of head and neck malignancies. It is still unclear if the hypolipidemia present at the time of diagnosis is a cause or an effect of the malignancy.[6-8]

This study was conducted to assess the serum lipid profile in patients with oral cancer.

## MATERIAL AND METHODS
There were a total of 100 subjects in the study. In this investigation, subjects with oral cancer confirmed by histology as well as those without any underlying systemic illness were included. Subjects who were overweight or older than 65 were not allowed to participate in the study. The subjects were split into two groups of fifty each, one for each type of oral cancer and one for healthy ones. Fifty people without the condition made up Group 1, while fifty subjects with the disease made up Group 2. Descriptive statistics were employed in this study in order to reach

findings. The results for categorical variables are shown as a percentage, and the findings for continuous variables are shown as mean SD (Min-Max). The results are deemed significant at the 5% level of significance. Analysis of variance is performed to compare research parameters among three or more patient groups; the Post hoc test according to Tukey is used to compare pairwise comparisons. The 3x3 Fisher exact test was used to assess the significance of categorical study parameters between two or more groups. The results are deemed significant at the 5% level of significance.

## RESULTS

**Table 1: Gender-wise distribution of subjects.**

| Groups | Males | Females | Total number of subjects |
|---|---|---|---|
| Control group | 25 | 25 | 50 |
| Oral cancer group | 25 | 25 | 50 |

In the control group, there were 25 males and 25 females. In the second group there were 25 males and 25 females.

**Table 2: Serum lipid profile of control group and oral cancer group.**

| Lipid parameters (mg/dl) | Control group | Oral cancer group |
|---|---|---|
| Triglycerides | 163.41 | 100.01 |
| Total cholesterol (TC) | 209.89 | 136.77 |
| HDL | 91.05 | 38.11 |
| LDL | 104.36 | 41.19 |
| VDL | 42.09 | 15.55 |
| Cholesterol-HDL ratio | 4.12 | 5.69 |

According to the study, the control group's mean plasma triglyceride levels were 163.41 mg/dl, while the oral cancer group's mean levels were 100.01 mg/dl. The mean plasma triglyceride levels of the malignant groups were found to be lower than those of the control group. In the cancer group, the mean plasma TC level was 136.77 mg/dl, while in the non-cancer group, it was 209.89 mg/dl. The plasma TC levels were significantly lower in the malignant groups when compared to the control group.

## DISCUSSION

In recent years, detection of molecular markers is being emphasized. Body fluids such as saliva, blood, urine and others are used for early diagnosis, predicting prognosis and monitoring the progression of diseases. Blood based tests is more appealing; with the view of its ease, economic advantage and possibility to repeat sampling.[9]

Lipids are essential biomolecules for maintenance of various biological functions including stabilization of deoxyribonucleic acid helix, cell growth and division in normal as well as in malignant tissues.[10] The usefulness of variations in blood cholesterol levels in diagnosis and treatment of various diseases have been studied by several workers. An increase in the level of cholesterol is a major risk factor for coronary heart diseases; on the other hand, the decrease in the level of cholesterol has been associated with an increased risk of cancer.

Oral cancer is one of the most prevalent cancers and is the tenth most common causes of death.[9] Oral squamous cell carcinoma is often preceded by specific potentially malignant disorders; the most common among them are the oral leukoplakia and oral submucous fibrosis (OSMF). Well-known risk factors are consumption of tobacco, areca nut and alcohol, which result in increased free radicals production. Free radicals cause lipid peroxidation, which in turn affects various cellular vital activities including growth, differentiation and gene expression.[11,12]

This study was conducted to assess the serum lipid profile in patients with oral cancer.

In this study 50 subjects were in the control group and 50 subjects had oral cancer. Also, there were 25 males and 25 females in both the groups. The control group's mean plasma triglyceride levels were 163.41 mg/dl, while the oral cancer group's mean levels were 100.01 mg/dl. The mean plasma triglyceride levels of the malignant groups were found to be lower than those of the control group. In the cancer group, the mean plasma TC level was 136.77 mg/dl, while in the non-cancer group, it was 209.89 mg/dl. The plasma TC levels were significantly lower in the malignant groups when compared to the control group.

**Acharya S.et al[13]** evaluated the serum lipid profile in oral squamous cell carcinoma (OSCC) and its prognostic significance. Ninety untreated OSCC patients, who reported to the craniofacial unit for treatment between 2011 and 2014, were identified to obtain clinicopathological data and preoperative blood investigations including lipid profile. The fasting blood lipid profile, including total cholesterol (TC), triglyceride (TG), high density lipoprotein (HDL), and low density lipoprotein (LDL), was evaluated using a fully automated biochemistry analyser. Data were analyzed statistically using the Student's t-test, analysis of variance, and post hoc tests. Statistically significant decreases in serum TC, HDL, and LDL levels were observed in OSCC patients as compared to healthy controls ($P<0.05$). There was no statistically significant difference in mean lipid profile

values in terms of stage, grade, or lymph node metastasis. This study identified changes in lipid profiles in OSCC. The results suggested that during the development and progression of OSCC, levels of serum lipids are decreased.

Singh S.et al[14] evaluated alterations in plasma lipid profile in oral cancer patients, to compare and correlate the serum lipid profile in different grades of carcinoma and to evaluate the correlation of serum lipid profile between the tobacco habituates and non-habituates. Among 75 study subjects, 50 individuals were oral carcinoma patients and 25 individuals were healthy controls. The parameters assessed included total cholesterol (TC), high-density lipoprotein-cholesterol (HDLC), low-density lipoprotein-cholesterol, very low-density lipoprotein-cholesterol and triglycerides (TGL). These groups were subdivided into subjects with no habit of tobacco (NHT) and subjects with habit of tobacco (WHT). Evaluation of results and statistical analysis was carried out using Student's t-test and one-way Analysis of Variance. There was a significant decrease in TC, HDLC and TGL in the oral cancer group as compared with the control group. The lipid profile levels between histological grading of the oral cancer and between WHT and NHT had no statistical significance. There was an inverse relationship between serum lipid profile and oral cancer.

## CONCLUSION

The risk of oral cancer was inversely correlated with serum lipid profile. A decrease in serum lipid levels may be a precursor to changes occurring in cancerous cells, according to some data.

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