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Serum Lipid Profile in Patients with Oral Squamous Cell Carcinoma

¹Dr. Santosh Kumar S Kotnoor, ²Dr. Priyanka Umesh Patil, ³Dr. Divya Agarwal, ⁴Dr. Karri. Seshu Kumar, ⁵Dr. Charankamaldeep Kaur, ⁶Dr. Aarzoo S Sihag

¹Reader, Department of Oral Pathology and Microbiology, Hke'society S Nijlingappa Dental College and Research Kalaburagi, Karnataka State, India

²Bachelor of Dental Surgery, India

³Senior Lecturer, Department of Oral & Maxillofacial Pathology and Microbiology Kothiwal Dental College and Research Centre, Moradabad, UP, India

⁴Assistant Professor, Department of OMFS, Government Dental College and Hospital, Kadapa, India

⁵B.D.S, India

⁶Dental Surgeon (BDS) India

Corresponding author: Dr. Santosh Kumar S Kotnoor, Reader, Department of Oral Pathology and Microbiology, Hke'society S Nijlingappa Dental College and Research Kalaburagi, Karnataka State, India

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	ABSTRACT:				
KEYWORDS cancer, malignancy, orol linid	Background : This study had been carried out to evaluate serum lipid profile among subject having oral squamous cell carcinoma.				
oral, lipid profile.	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 sixty five years were not allowed to participate in the study. The subjects had been split into two groups of fifty subjects 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 five percent 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 significant at the 5% level of significance.				
	Results : The study reveat concentrations of 110.5 m discovered that the malign those of the control group. 209.7 mg/dl in the non-cat as cancerous groups had of the non-cancer group were 45.8 mg/dl. There was a s cancerous groups and the 109.5 mg/dl, whereas thos	led that the oral cancer grou ag/dl and the control group had n ant groups had mean plasma trig. The mean plasma TC level was h neer group. Compared to the cont considerably decreased plasma TC e 86.4 mg/dl, while the average H ubstantial drop in plasma HDL le control group. Those without can e with cancer had values of 58.9 m	p had mean plasma triglyceride nean levels of 162.5 mg/dl. It was lyceride levels that were lower than 137.7 mg/dl in the cancer group and rol group, the precancerous as well C levels.The average HDL levels in DL levels in the cancer group were evels between the precancerous and cer had mean plasma LDL levels of mg/dl. In both the precancerous and		

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cancerous groups, plasma LDL levels are much lower than in the control group. The average values of very low density lipoprotein (VLDL) in the plasma were 41.1 and 12.41 mg/dl in the control and oral cancer groups, respectively, according to this study. Both the precancerous and cancerous groups showed significantly lower plasma VLDL levels compared to the control group. The ratio of total plasma cholesterol to high-density lipoprotein (HDL) was 3.56 in the healthy group and 4.71 in the oral cancer group. The plasma cholesterol to HDL ratio is much higher in the precancerous and cancerous groups than in the control group.

Conclusion: The risk of oral cancer was inversely correlated with serum lipid profile. There is data that suggests a decrease in serum lipid levels may indicate neoplastic cell changes before they become apparent.

Introduction

Oral squamous cell carcinoma (OSCC) is a common malignant subtype of oral cancer which had an incidence of approximately 377 000 cases worldwide according to GLOBOCAN 2020.1 Despite continuous advances such as radiotherapy plus cetuximab, and the treatment of anti-programmed death 1 monoclonal antibody in head and neck squamous cell carcinoma (HNSCC) patients in the clinical management, the patients with HNSCC have a poor survival.2-4 Moreover, oral potentially malignant disorders (OPMD), which are a recognizable type of clinically suspicious lesion that has the risk of progressing to cancer, are a group of diseases that may precede the development of OSCC.5 OPMD mainly include oral leukoplakia (OLK), oral lichen planus (OLP), erythroplakia, erythroleukoplakia, proliferative verrucous leukoplakia (PVL), oral submucous fibrosis (OSF), and lupus erythematosus.^{6,7}

Lipids are cell membrane components essential for various biological functions. Although their prime role in pathogenesis of cardiovascular disease has been consistently found, researchers have reported an association of serum lipids with different cancers.^{8,9} However, only a few reports are available on plasma lipid profile in head and neck cancers.¹⁰⁻¹² The question of whether hypolipidemia at the time of diagnosis is a causative factor or a result of cancer has remained unanswered.¹³

Hence, the current study had been conducted to evaluate the serum lipid profile of subjects having oral squamous cell carcinoma.

Material and Methods

There were total 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 sixty five years were not allowed to participate in the study. The subjects had been split into two groups of fifty subjects 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 five percent 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.

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Histopathological and clinical presentation of oral squamous cell carcinoma.

Results

Table 1:	Gender-wise	distribution	of subjects.
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Groups	Males	Females	Total number of subjects
Control group	33	17	50
Oral cancer group	39	11	50
Total	72	28	100

In the control group, there were 33men and 17women. In the second group there were 39men and 11women.

Lipid parameters (mg/dl)	Control group	Oral cancer group
Triglycerides	162.5	110.5
Total cholesterol (TC)	209.7	137.7
HDL	86.4	45.8
LDL	109.5	58.9
VDL	41.1	12.41
Cholesterol-HDL ratio	2.89	5.49

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

The study revealed that the oral cancer group had mean plasma triglyceride concentrations of 110.5 mg/dl and the control group had mean levels of 162.5 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 137.7 mg/dl in the cancer group and 209.7 mg/dl in the noncancer group. Compared to the control group, the precancerous as well as cancerous groups had considerably decreased plasma TC levels. The average HDL levels in the non-cancer group were 86.4 mg/dl, while the average HDL levels in the cancer group were 45.8 mg/dl. There was a substantial drop in plasma HDL levels between the precancerous and cancerous groups and the control group. Those without cancer had mean plasma LDL levels of 109.5 mg/dl, whereas those with cancer had values of 58.9 mg/dl. In both the

precancerous and cancerous groups, plasma LDL levels are much lower than in the control group. The average values of very low density lipoprotein (VLDL) in the plasma were 41.1 and 12.41 mg/dl in the control and oral cancer groups, respectively, according to this study. Both the precancerous and cancerous groups showed significantly lower plasma VLDL levels compared to the control group. The ratio of total plasma cholesterol to high-density lipoprotein (HDL) was 3.56 in the healthy group and 4.71 in the oral cancer group. The plasma cholesterol to HDL ratio is much higher in the precancerous and cancerous groups than in the control group.

Discussion

Oral cancer is one of the most common forms of cancer around the world, with about 90 to 95% being oral www.jchr.org

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squamous cell carcinoma (OSCC).¹⁴ OSCC was also considered to be preceded by various oral potentially malignant disorders (OPMDs) with 2-12% of them transforming into cancers.¹⁵ The survival rate of OSCC can be improved by early detection and treatment. The early detection of OPMDs prevents their progression to an invasive carcinoma which leads to increased quality of life among the patients. In recent years, prominence has been placed on detecting biomarkers from body fluids for predicting prognosis, and monitoring disease progression. One such biomarker can be 'Lipid profile'.¹⁶

Lipids are present as membrane components of the cell and are essential for various biological functions, including cell division, growth of normal and malignant tissues. The newly proliferating tumour cells would require many basic components well above the normal limits, for the maintenance of structural and functional integrity of all biological membranes. The increased requirement of lipids to fulfil the need of these proliferating cells is expected to diminish the existing lipid stores (Hypocholesteremia).¹⁷

Biological lipids are a chemically diverse group of compounds, the common and defining feature of which is their insolubility in water. The biological functions of the lipids are as diverse as their chemistry.¹⁸ The lipid profile is a group of tests that typically includes total cholesterol (TC), triglycerides (TGL), high-density lipoprotein-cholesterol (LDLC) and very low-density lipoprotein-cholesterol (VLDLC).

Hence, this study was conducted to assess the serum lipid profile of subjects having oral cancer.

This study revealed that the oral cancer group had mean plasma triglyceride concentrations of 110.5 mg/dl and the control group had mean levels of 162.5 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 137.7 mg/dl in the cancer group and 209.7 mg/dl in the noncancer group. Compared to the control group, the precancerous as well as cancerous groups had considerably decreased plasma TC levels.The average HDL levels in the non-cancer group were 86.4 mg/dl, while the average HDL levels in the cancer group were 45.8 mg/dl. There was a substantial drop in plasma HDL levels between the precancerous and cancerous groups and the control group. Those without cancer had mean plasma LDL levels of 109.5 mg/dl, whereas those with cancer had values of 58.9 mg/dl. In both the precancerous and cancerous groups, plasma LDL levels are much lower than in the control group. The average values of very low density lipoprotein (VLDL) in the plasma were 41.1 and 12.41 mg/dl in the control and oral cancer groups, respectively, according to this study. Both the precancerous and cancerous groups showed significantly lower plasma VLDL levels compared to the control group. The ratio of total plasma cholesterol to high-density lipoprotein (HDL) was 3.56 in the healthy group and 4.71 in the oral cancer group. The plasma cholesterol to HDL ratio is much higher in the precancerous and cancerous groups than in the control group.

Ghosh G et al (2011)¹⁹ evaluated alterations in serum lipid profile in oral squamous cell carcinoma patients as well as its association with the habit of tobacco consumption. The study included 30 oral squamous cell carcinoma patients, 20 patients with the habit of tobacco consumption and 20 controls. Serum lipids, including (i) total cholesterol, (ii) LDL cholesterol (LDLC), (iii) HDL cholesterol (HDLC), (iv) VLDL cholesterol (VLDLC) and (v) triglycerides, were analyzed by spectrophotometric kits.A significant decrease in serum total cholesterol (TC) levels, triglyceride levels (p = 0.007, p = 0.029 respectively) were observed in oral squamous cell carcinoma patients as compared to the healthy control group. The mean serum HDLC levels (p = 0.003) were significantly lowered in the tobacco habituates when compared to the healthy controls. The mean serum total cholesterol levels were significantly lower in subjects with oral squamous cell carcinoma (p = 0.000) as compared to the tobacco habituates. Likewise, LDLC levels and TC:HDLC ratios (p = 0.000and p = 0.000 respectively) were significantly decreased in oral squamous cell carcinoma patients as compared to the tobacco habituates. Their data strengthens the evidence of an inverse relationship between serum lipid levels and oral squamous cell carcinoma. The lower level of serum cholesterol and other lipid constituents in the patients is thought to be due to their increased usage by tumor cells for new membrane biogenesis.

Singh S et al $(2013)^{20}$ 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-

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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 lowdensity 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 oneway 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. There is data that suggests a decrease in serum lipid levels may indicate neoplastic cell changes before they become apparent.

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