

Original Article

Comparative Evaluation of Alterations in Serum Lipid Profile in Patients with Oral Leukoplakia

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ABSTRACT:

Background: The alterations in the circulatory cholesterol levels have been found to be associated with etiology of breast cancer and colorectal cancer. However, only a few reports are available on plasma lipid profile in head and neck cancer. **Aim:** To evaluate various lipid parameters in patients with oral leukoplakia. **Materials and method:** The study was conducted in the Department of Oral medicine of the dental institution. For the study group, we selected a total of 20 subjects ranging from 18 to 55 years diagnosed with oral leukoplakia which reported to the outpatient clinic of the department. For the evaluation of Total cholesterol, HDL and LDL 5 mL of blood was obtained from each patient. The blood was sent to the lab for evaluation. The obtained data was tabulated for further evaluation. **Results:** A total of 40 patients were included in the study, 20 in study group and 20 in control group. We observed that total cholesterol level in study group was 149.71 mg/dL and in control group was 189.64 mg/dL. Level of HDL in study group was 38.12 mg/dL and in control group was 46.89 mg/dL. The level of LDL in study group was 102.82 mg/dL and in control group was 122.39 mg/dL. **Conclusion:** Within the limitations of the study we conclude that plasma HDL, LDL and total cholesterol levels in patients with oral leukoplakia are slightly reduced and may act as a marker for diagnosing pre-cancerous conditions. Still further research is needed in this context.

Keywords: Oral leukoplakia, pre-cancerous, cholesterol, HDL.

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INTRODUCTION:

Lipids in the cytoplasm and cell membrane play a pivotal role in various biological functions such as cell division and cell growth. Usefulness of variations in tissue/blood cholesterol levels in diagnosis and treatment of various diseases has been studied by several workers. Although, its prime role in pathogenesis of coronary heart disease has been consistently found, researchers have reported association of plasma/serum lipids and lipoproteins with different cancers.^{1, 2} The alterations in the circulatory cholesterol levels have been found to be associated with etiology of breast cancer and colorectal cancer.^{3, 4} However, only a few reports are available on plasma lipid profile in head and neck cancer. Head and neck cancer is one of the leading causes of morbidity and mortality due to cancer. Its incidence is much higher in Asian countries, as compared to

the West.^{5, 6} Hence, the present study is planned to evaluate various lipid parameters in patients with oral leukoplakia.

MATERIALS AND METHOD:

The study was conducted in the Department of Oral medicine of the dental institution. For the study group, we selected 20 subjects ranging from 18 to 55 years diagnosed with oral leukoplakia which reported to the outpatient clinic of the department. The ethical clearance for the study was obtained from ethical board of the institute. An informed written consent was obtained from the patients after explaining them the procedure of the study. 20 healthy individuals were also selected as control group. Patients having systemic illness such as diabetes mellitus, leukemia, acute hepatitis, nephritis that can interfere with the results were excluded from the study.

For the evaluation of Total cholesterol, HDL and LDL 5 mL of blood was obtained from each patient for the evaluation of plasma lipid profile of each patient. The blood was sent to the lab for evaluation. The obtained data was tabulated for further evaluation.

The statistical analysis of the data was done using SPSS software version 20.0 for windows. Student’s t-test and Chi-square test were used for checking the statistical significance of the data. A p-value <0.05 was predefined to be statistically significant

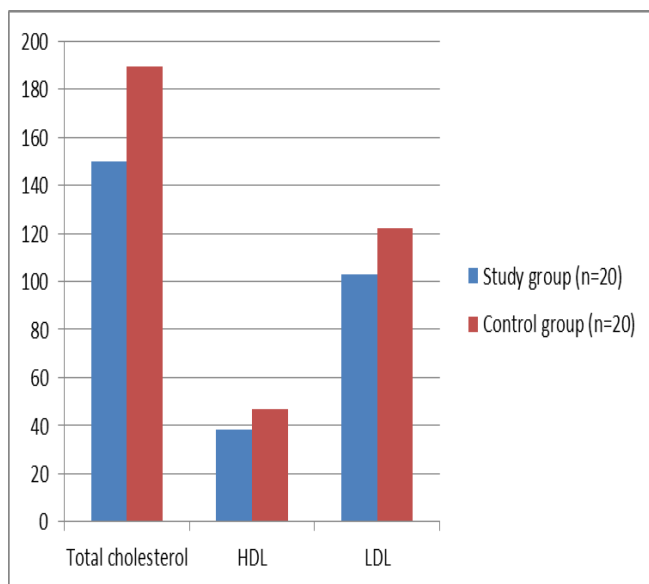
RESULTS:

A total of 40 patients were included in the study, 20 in study group and 20 in control group. **Table 1** shows the comparative analysis of plasma lipid panel between study group and control group. We observed that total plasma cholesterol level in study group was 149.71 mg/dL and in control group was 189.64 mg/dL. Level of HDL in study group was 38.12 mg/dL and in control group was 46.89 mg/dL. The level of LDL in study group was 102.82 mg/dL and in control group was 122.39 mg/dL. On comparing the results we observed that results are statistically significant with p-value <0.05 [Fig 1].

Table 1: Comparative analysis of lipid panel between study group and control group

Lipid parameters	Mean evaluated value		p-value
	Study group (n=20)	Control group (n=20)	
Total cholesterol	149.71	189.64	0.001
HDL	38.12	46.89	0.02
LDL	102.82	122.39	0.05

Figure 1: Bar graph showing lipid profile between study group and control group



DISCUSSION:

Leukoplakia is the most common premalignant or potentially malignant lesion of the oral mucosa.⁷ The term leukoplakia was derived from the Greek word Leuko - White and plax - plaque. The condition was first described by Bazin and others as a type of lingual psoriasis, but it was Schwimmer in 1877, who differentiated it from psoriasis and described it under the present name.⁸ Axell T et al in 1984 modified the definition of leukoplakia to “A whitish patch or plaque which cannot be characterized clinically or pathologically as any other disease and is not associated with any physical or chemical causative agent except the use of tobacco.”⁹

In the present study we evaluated the lipid panel in patients with oral leukoplakia. We observed that mean plasma total cholesterol level in study group was slightly lower as compared to control subjects. Similar trend was observed with HDL and LDL. The results were statistically significant. The results are consistent with previous studies that low HDL is an additional predictor of cancer. Kumar P et al evaluated the implications of altered serum lipid profile in patients with oral cancer (OC), oral leukoplakia (OLP), and tobacco habits. Thirty patients with OC, 30 with OLP, 30 tobacco abusers (TAs), and 30 age and sex matched healthy controls were included in the study. Serum lipid profile including total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL), Very low density lipoprotein (VLDL), and triglycerides (Tg) were evaluated using a fully automatic Biochemistry analyzer. Difference in lipid profile in various types of TA, that is, smokeless tobacco (SLT), smoking tobacco (ST), and a combination (Comb) usage of both forms were also analyzed. TC, HDL, and LDL were much lower in the OC group compared with control. Although these parameters were low in the OPC group compared with controls, the difference was not significant. On histological analysis, TC and HDL were found to decrease marginally with loss of tumor differentiation in OC. No correlation was found between the mean serum lipid profiles and degree of dysplasia in OLP. TC and HDL were significantly lesser in all forms of TA when compared with control. It was concluded that there may be an inverse relationship between serum lipid profile and OC. No significant reduction in lipid profile was observed in the OLP group. This may indicate that hypolipidemia is a late change occurring during carcinogenesis or is an effect rather than the cause of cancer. Garg D et al evaluated the alterations in serum lipid profile in untreated patients of oral submucosa fibrosis (OSMF), oral leukoplakia, and oral lichen planus and proven cases of oral cancer with respect to healthy controls. In this case control study, 20 clinically and histopathologically proven patients of oral precancer and oral cancer each were compared with 20 healthy controls. In these groups, serum lipids including: (i) Total cholesterol. (ii) Triglycerides (TGL). (iii) High density lipoprotein cholesterol (HDL), low density lipoprotein cholesterol

(LDL) and very low density lipoprotein cholesterol (VLDL) were analyzed. Decrease in plasma total cholesterol, triglycerides, HDL, LDL, VLDL in the subjects with the oral precancer and oral cancer as compared to the controls was statistically significant. There was also decrease in plasma levels of TGL and VLDL in oral cancer subjects as compared to precancer subjects. Thus, it was found that there is an inverse relationship between plasma lipid levels and patients. The authors concluded that post-operative morbidity was increasing along with more operating time and increase in the depth of mandibular third molar impaction.^{10, 11}

Subbulakshmi AC et al evaluated the serum lipid profile among untreated oral squamous cell carcinoma (OSCC) and oral submucous fibrosis (OSMF) patients. This study was done in three groups of patients - OSMF, OSCC, and control. There are twenty participants in each group. Calorimetric method using semi-autoanalyzer was used for analyzing the lipid levels (cholesterol, triglycerides [TGL], and high-density lipids [HDL]) after collecting 2 ml of fasting blood from these patients. Low-density lipid [LDL] values were obtained by calculator method. There was a significant decrease in serum lipid levels of patients with OSMF and OSCC. It was concluded that the decrease in lipid levels in OSMF and OSCC patients is due to its utilization by the cells during the cancer process. Patel PS et al evaluated alterations in plasma lipid profile in untreated head and neck cancer patients as well as patients with oral precancerous conditions (OPC) and its association with habit of tobacco consumption. This hospital-based case control study included 184 head and neck cancer patients, 153 patients with OPC and 52 controls. Plasma lipids including: (i) Total cholesterol, (ii) LDL cholesterol (LDLC), (iii) HDL cholesterol (HDLC) (iv) VLDL cholesterol (VLDLC) and (v) triglycerides were analysed by spectrophotometric kits. A significant decrease in plasma total cholesterol and HDLC was observed in cancer patients as well as in patients with OPC as compared to the controls. The plasma VLDL and triglycerides levels were significantly lower in cancer patients as compared to the patients with OPC and controls. The tobacco habituates showed lower plasma lipid levels than the non-habituates. Their data strengthen the evidence of an inverse relationship between plasma lipid levels and head and neck malignancies as well as OPC. It was concluded that the lower levels of plasma cholesterol and other lipid constituents in patients might be due to their increased utilization by neoplastic cells for new membrane biogenesis. The findings strongly warrant an in-depth study of alterations in plasma lipid profile in head neck cancer patients.^{12, 13}

CONCLUSION:

Within the limitations of the study we conclude that plasma HDL, LDL and total cholesterol levels in patients with oral leukoplakia are slightly reduced and may act as a marker for diagnosing pre-cancerous conditions. Still further research is needed in this context.

REFERENCES:

1. Schatzkin A, Hoover RN, Taylor PR, Ziegler RG, Carter CL, Albanes D, et al. Site-specific analysis of total serum cholesterol and incident cancers in the National Health and Nutrition Examination Survey I epidemiologic follow-up study. *Cancer Res* 1988;48:452-8.
2. Halton JM, Nazir DJ, McQueen MJ, Barr RD. Blood lipid profiles in children with acute lymphoblastic leukemia. *Cancer* 1998;83:379-84.
3. Simo CE, Orti LA, Sena FF, Contreras BE. Blood cholesterol in patients with cancer. *An Med Interna* 1998;15:363-6.
4. Allampallam K, Dutt D, Nair C, Shetty V, Mundle S, Lisak L, et al. The clinical and biologic significance of abnormal lipid profiles in patients with myelodysplastic syndromes. *J Hematother Stem. Cell Res* 2000;9:247-55.
5. Gerber M, Richardson S, DePaulet PC, Pujol H, DePaulet AC. Relationship between vitamin E and polyunsaturated fatty acids in breast cancer: Nutritional and metabolic aspects. *Cancer* 1989;64:2347-53.
6. Gerber M, Cavallo F, Marubini E, Richardson S, Barbieri A, Capitelli E, et al. Liposoluble vitamins and lipid parameters in breast cancer. A joint study in Northern Italy and Southern France *Int J Cancer* 1988;42:489-94.
7. R Rajendran. Oral leukoplakia (Leukokeratosis):Compilation of facts and figures. *J Oral MaxillofacPathol.* 2004;8(2):58–68.
8. CR Rein, JJ Goodman. Leukoplakia buccalis. *CA Cancer J Clin.* 1954;4(5):164–166.
9. Yh Yang, YC Lien, PS Ho, CH Chen, JS Chang, TC Cheng, et al. The effects of chewing areca betel quid with and without cigarette smoking on oral sub-mucous fibrosis and oral mucosal lesions. *Oral Diseases.* 2005;11:88–94.
10. Kumar P, Augustine J, Urs AB, Arora S, Gupta S, Mohanty VR. Serum lipid profile in oral cancer and leukoplakia: correlation with tobacco abuse and histological grading. *J Cancer Res Ther.* 2012 Jul-Sep;8(3):384-8. doi: 10.4103/0973-1482.103517.
11. Garg D, Sunil MK, Singh PP, Singla N, Rani SR, Kaur B. Serum lipid profile in oral precancer and cancer: a diagnostic or prognostic marker? *J Int Oral Health* 2014;6(2):33-9.
12. Subbulakshmi AC, Mohan N, Thiruneervannan R, Naveen S. Comparative Evaluation of Serum Lipid Profile in Patients with Oral Submucous Fibrosis and Oral Squamous Cell Carcinoma with that of Control Subjects: A Case Control Study. *J Pharm Bioallied Sci.* 2017 Nov;9(Suppl 1):S191-S196. doi: 10.4103/jpbs.JPBS_142_17.
13. Patel PS, Shah MH, Jha FP, Raval GN, Rawal RM, Patel MM, Patel JB, Patel DD. Alterations in plasma lipid profile patterns in head and neck cancer and oral precancerous conditions. *Indian J Cancer.* 2004 Jan-Mar;41(1):25-31.

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