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Original Research

Assessment of serum lipid profile in oral pre cancer patients

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ABSTRACT:
Background: To evaluate the serum lipid profile in pre cancer subjects. **Materials & Methods:** A cohort comprising 20 participants was enlisted for the study, with their ages ranging from 45 to 65 years. Subsequent to the collection of laboratory samples, including blood, the levels of cholesterol, triglycerides, and HDL in the plasma were computed. The acquired data were then subjected to analysis using the SPSS software. **Results:** In Group II, referred to as the control group, there were also 10 patients, including 2 females and 8 male subjects. Within Group I, the triglyceride level was measured at 142.51 mg/dl, whereas in Group II, this level was noted as 198.7 mg/dl. The data revealed a statistically significant observation, with a P-value of less than 0.001. **Conclusion:** The change in lipid levels can have a diagnostic role in oral pre cancer subjects.
Keywords: pre cancer, lipid, triglycerides.

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INTRODUCTION

Early detection is the key for oral cancer control. Premalignant lesions and conditions usually precede oral cancer. [1] Oral submucous fibrosis (OSMF), an insidious chronic disease, reported mainly in Indians associated with the use of areca nut is a precancerous condition and has a significant tendency to develop oral and esophageal cancer. [2]Oral cancer is one of the most prevalent cancers and is the tenth most common causes of death. [3] 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. [4]

Lipids are high energy yielding molecules and include fats and oils, waxes, phospholipids, steroids and some other related compounds. Fats and oils are made from two kinds of molecules: one glycerol and three fatty acids joined by dehydration synthesis, known as triglycerides (TGs), which are the major form of energy storage. For transport in plasma, TGs and cholesterol are packaged into lipoproteins, which are then taken up and degraded by cells to fulfill the demands for cellular functions. Lipids are major cell membrane components essential for various biological functions including cell growth and division of normal and malignant tissues, maintenance of the structural and functional integrity of all biological membranes, activity of membrane-bound enzymes and stabilization of DNA helix. [5] There are two main categories of lipoproteins: high density lipoprotein (HDL) being associated with carrying "cholesterol" out of the blood system and low density lipoprotein (LDL) which transports 75% of plasma cholesterol. [6] Cell receptors metabolize circulating LDL and clear nearly 80% of it from the body, while the rest of it is associated with deposition of "cholesterol" on the walls of arteries.Cholesterol is an amphipathic lipid and it is an essential structural component of all cell

membranes and of the outer layer of plasma lipoproteins. It is present either as free cholesterol or combined with a long-chain fatty acid, as cholesterylesterin tissues and in plasma lipoprotein. [7] Fundamentally the development of a malignancy requires the uncontrolled and excessive proliferation of cells. [8] These rapidly forming cells need many basic components well above the normal limits which are used in physiological process. One such component which forms major cell membrane components essential for various biological functions including cell division and growth of normal and malignant tissues is lipids. Lipid stores are diminished due to increased use of lipids by this rapidly dividing cells.[9] Hence, this study was conducted to evaluate the serum lipid profile in pre cancer subjects.

MATERIALS & METHODS

A cohort comprising 20 participants was enlisted for the study, with their ages ranging from 45 to 65 years. Among them, 10 individuals with clinically identified oral precancer conditions were selected as subjects. Concurrently, 10 individuals in good health, devoid of recent major illnesses or complaints, were chosen as control group members. Detailed information encompassing signs, symptoms, historical data, habits, histopathology, and an extended lipid profile assessment was meticulously documented for all participants. Subsequent to the collection of laboratory samples, including blood, the levels of cholesterol, triglycerides, and HDL in the plasma were computed. The acquired data were then subjected to analysis using the SPSS software.

RESULTS

The research involved 20 patients, segregated into two distinct groups. In Group I, which comprised the precancer group, there were a total of 10 patients, with 3 being females and 7 being male subjects. In Group II, referred to as the control group, there were also 10 patients, including 2 females and 8 male subjects.Within Group I, the triglyceride level was measured at 142.51 mg/dl, whereas in Group II, this level was noted as 198.7 mg/dl. The data revealed a statistically significant observation, with a P-value of less than 0.001, indicating a substantial decrease in the average plasma triglyceride levels within the precancerous group when compared to the control group.

Moving on to the HDL, LDL, and VLDL levels in Group I, they were recorded as 52.14 mg/dl, 96.15 mg/dl, and 20.42 mg/dl, respectively. In contrast, the control group exhibited levels of 70.16 mg/dl for HDL, 114.25 mg/dl for LDL, and 36.10 mg/dl for VLDL. An evident and statistically significant reduction in plasma LDL levels within the precancerous group compared to the control group was noted, with a P-value of less than 0.001.Considering the total cholesterol level, the precancer group displayed a measurement of 168.75 mg/dl, while the control group showed a higher level of 224.24 mg/dl. Once again, the data underscored a statistically significant reduction in plasma total cholesterol levels within the precancerous group as opposed to the control group, with a P-value of less than 0.001.

Table: comparison of lipid profile

Lipid parameters	Group I	Group II	Significance
Triglycerides (mg/dl)	142.51	198.7	<0.001*
HDL (mg/dl)	52.14	70.16	<0.001*
LDL (mg/dl)	96.15	114.25	<0.001*
VLDL mg/dl)	20.42	36.10	<0.001*
Total cholesterol (mg/dl)	168.75	224.24	<0.001*

* : significant

DISCUSSION

The question whether hypolipidemia is a predisposing factor or result of cancer, still remains unanswered. In some malignant diseases, blood cholesterol undergoes early and significant changes. Low levels of cholesterol in the proliferating tissues and in blood compartments could be due to the process of carcinogenesis. The previous literatures evidence that hypolipidemia may result due to the direct lipid lowering effect of tumor cells or secondary to malfunction of the lipid metabolism. [10] Hence, this study was conducted to evaluate the serum lipid profile in pre cancer subjects.

In the present study, the research involved 20 patients, segregated into two distinct groups. In Group I, which comprised the precancer group, there were a total of 10 patients, with 3 being females and 7 being male subjects. In Group II, referred to as the control group, there were also 10 patients, including 2 females and 8 male subjects. Within Group I, the triglyceride level was measured at 142.51 mg/dl, whereas in Group II, this level was noted as 198.7 mg/dl. The data revealed a statistically significant observation, with a P-value of less than 0.001, indicating a substantial decrease in the average plasma triglyceride levels within the precancerous group when compared to the control group. A study by Mehta R et al, comprised of 60 patients with oral precancerous lesions/conditions, 60 patients with oral cancer and a control group of 60 healthy individuals. The diagnosis of oral precancerous lesions/conditions and oral cancer was confirmed histopathologically. Under aseptic condition 5 ml venous blood of overnight fasting patient was withdrawn from each individual. Serum

was separated by centrifugation and plasma levels of TC, LDL, HDL, VLDL and triglycerides were estimated. Statistically significant decrease in levels of plasma TC, LDL, HDL, VLDL and triglycerides was observed in the precancerous and cancerous groups as compared to the control group. On comparison between precancerous and cancerous groups, significant decrease was observed in cancerous group. The change in lipid levels may have an early diagnostic or prognostic role in the oral premalignant lesions/conditions and oral cancer. The presence of decreased plasma lipid profile should increase the suspicion of these lesions to be investigated further.[11]

In the present study, HDL, LDL, and VLDL levels in Group I, they were recorded as 52.14 mg/dl, 96.15 mg/dl, and 20.42 mg/dl, respectively. In contrast, the control group exhibited levels of 70.16 mg/dl for HDL, 114.25 mg/dl for LDL, and 36.10 mg/dl for VLDL. An evident and statistically significant reduction in plasma LDL levels within the precancerous group compared to the control group was noted, with a P-value of less than 0.001. Considering the total cholesterol level, the precancer group displayed a measurement of 168.75 mg/dl, while the control group showed a higher level of 224.24 mg/dl. Once again, the data underscored a statistically significant reduction in plasma total cholesterol levels within the precancerous group as opposed to the control group, with a P-value of less than 0.001. Another study by Subbulakshmi AC et al, 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.The decrease in lipid levels in OSMF and OSCC patients is due to its utilization by the cells during the cancer process.[12] Chawda JG et al, investigated the alterations and clinical significance of plasma lipid profiles in untreated head and neck cancer patients.A total of 30 subjects (25 oral cancer patients and 5 controls) were included. Fasting blood lipid profile including cholesterol (C), triglycerides (TG), high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL) were evaluated using spectrophotometric kits, with CHOD PAP technique. The levels of total lipids, cholesterol and HDL were significantly lower in oral cancer patients as compared to controls, but LDL and VLDL values were not significant.An inverse relationship was found between the lipid levels and the occurrence of oral cancer. Hence, the lower plasma lipid status may be a useful indicator to detect the initial changes seen in neoplastic process.[13] Singh S et al, 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).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. The lower serum lipid status may be considered a useful indicator for initial changes occurring in the neoplastic cells.[14] Garg D et al, a 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, serumlipids 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. Post operative morbidity was increasing along with more operating time and increase in the depth of mandibular third molar impaction. [15]

CONCLUSION

The change in lipid levels can have a diagnostic role in oral pre cancer subjects.

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