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Original Research

Evaluation of serum lipid levels in periodontitis patients

Saleeta Mushtaq[1], Priya Kaushal[2], Deepti Shakya[3], Raina JP Khanam[4]

[1]Sr. Lecturer, [3,4]Post graduate student, Department of Periodontics, Himachal Institute of Dental Sciences Paonta Sahib, Himachal Pradesh, India;
[2]Sr. Lecturer, Department of Periodontics, Yamuna Institute of Dental Sciences and Research, Yamuna Nagar, Haryana

ABSTRACT:
Background: Periodontitis is one of the most ubiquitous diseases and is characterized by the destruction of connective tissue and dental bone support following an inflammatory host response secondary to infection by periodontal bacteria. Hyperlipidemia or hyperlipoproteinemia, involves abnormally elevated levels of any or all lipids and/or lipoproteins in the blood. Hence: the present study was conducted for evaluating the serum lipid levels in periodontitis patients. **Materials & methods:** patients. A total of 30 patients with chronic periodontitis (Group 1) and 30 healthy controls (Group 2) were enrolled. Complete demographic details of all the patients were obtained. All patients were called in the morning and blood samples were obtained and were sent to laboratory. In the laboratory, autoanalyzer was used for evaluating the serum lipid profile. Following parameters were recorded: serum total cholesterol, high-density lipoprotein (HDL), very low-density lipoprotein (VLDL), and LDL (low density lipoproteins). **Results:** Mean LDL levels and mean total cholesterol levels were raised significantly in periodontitis patients. Mean HDL levels and mean VLDL levels were non-significantly altered in periodontitis patients. **Conclusion:** Mean lipid profile of the periodontitis patients is significantly raised in comparison to healthy controls.
Key words: Periodontitis, Lipid profile.

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Corresponding author: Dr Saleeta Mushtaq, Sr. Lecturer Department of Periodontics, Himachal Institute of Dental Sciences Paonta Sahib, Himachal Pradesh, India

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INTRODUCTION

Periodontitis is one of the most ubiquitous diseases and is characterized by the destruction of connective tissue and dental bone support following an inflammatory host response secondary to infection by periodontal bacteria. Severe periodontitis, which may result in tooth loss, is found in 5–20% of most adult populations worldwide. Periodontal diseases are disease processes involving the periodontium, a term used to describe the supportive apparatus surrounding a tooth, which includes the gums (gingiva), alveolar bone, cementum, and periodontal ligament.[1-3] Gingivitis is the mildest form of periodontal disease and can be found in up to 90% of the population. It is a term used to describe the inflammation of the gingiva due to the accumulation of bacteria and debris between the gum line and tooth, also known as dental plaque. Hyperlipidemia or hyperlipoproteinemia, involves abnormally elevated levels of any or all lipids and/or lipoproteins in the blood. Hyperlipidemia causes hyperactivity of white blood corpuscles (increased production of oxygen radicals) which may be associated with the development of periodontitis in adults.[4- 6] Hence: the present study was conducted for evaluating the serum lipid levels in periodontitis patients.

MATERIALS & METHODS

The present study was conducted with the aim of assessing the serum lipid profile in periodontitis patients. A total of 30 patients with chronic periodontitis (Group 1) and 30 healthy controls (Group 2) were enrolled. Complete demographic details of all the patients were obtained. A Performa was made and complete clinical radiographic details of all the patients were recorded. All patients were called in the morning and blood samples were obtained and were sent to laboratory. In the laboratory, autoanalyzer was used for evaluating the serum lipid profile. Following parameters were

recorded: serum total cholesterol, high-density lipoprotein (HDL), very low-density lipoprotein (VLDL), and LDL (low density lipoproteins). All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Mann-Whitney U was used for evaluation of level of significance.

RESULTS

In the present study, a total of 30 patients with chronic periodontitis and 30 healthy controls were enrolled. Mean age of the periodontitis patients and the healthy controls was found to be 49.6 years and 48.2 years respectively. There were 18 males and 12 females in group 1 and 19 males and 11 females in group 2. Mean LDL levels among the periodontitis patients and the healthy controls were found to be 118.4 mg/dL and 79.7 mg/dL respectively. Mean total cholesterol levels among the periodontitis patients and the healthy controls were found to be 175.6 mg/dL and 118.4 mg/dL respectively. On comparing statistically, it was seen that mean LDL levels and mean total cholesterol levels were raised significantly in periodontitis patients.

In the present study, mean HDL levels among the periodontitis patients and the healthy controls were found to be 34.3 mg/dL and 32.1 mg/dL respectively. Mean VLDL levels among the periodontitis patients and the healthy controls were found to be 35.6 mg/dL and 34.1 mg/dL respectively. On comparing statistically, it was seen that mean HDL levels and mean VLDL levels were non-significantly altered in periodontitis patients.

Graph 1: Demographic data

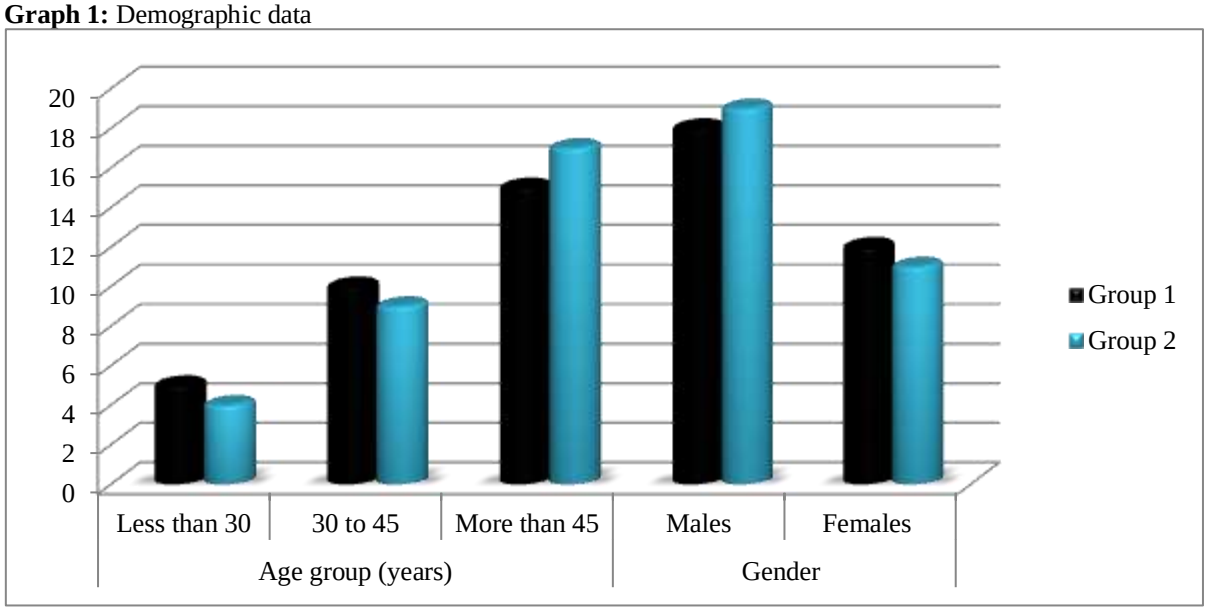

Table 1: Comparison of lipid profile

Lipid profile	Group 1	Group 2	p- value
LDL levels (mg/dL)	118.4	79.7	0.01*
Total cholesterol levels (mg/dL)	169.3	121.2	0.00*
HDL levels (mg/dL)	34.3	32.1	0.28
VLDL levels (mg/dL)	35.6	34.1	0.33

*: Significant

DISCUSSION

Periodontitis is associated with the increase in the level of C-reactive protein and fibrinogen, irrespective of coronary diseases. Furthermore, there is evidence that suggests that the increase in the levels of systemic markers of inflammation, such as the C-reactive protein (CRP) and interleukin-6 (IL-6), is associated with cardiovascular diseases.[7- 9]

In the present study, Mean LDL levels among the periodontitis patients and the healthy controls were found to be 118.4 mg/dL and 79.7 mg/dL respectively. Mean total cholesterol levels among the periodontitis patients and the healthy controls were found to be 175.6 mg/dL and 118.4 mg/dL respectively. On comparing statistically, it was seen that mean LDL levels and mean total cholesterol levels were raised significantly in periodontitis patients. Chandrasekhar H et al evaluated the association between periodontitis and hyperlipidemia. Blood samples were obtained from 25 adult periodontitis patients and 25 healthy control subjects from those attending the Out Patient Department (OPD). Lipid profile was estimated by calorimetric method by using ERBA CHEM 5PLUS. The total cholesterol, triglycerides and VLDL level were high in patients with periodontitis than in normal

individuals with significant p value. The results of this study indicated the presence of a significant relationship between periodontitis and hyperlipidemia.[10]

In the present study, mean HDL levels among the periodontitis patients and the healthy controls were found to be 34.3 mg/dL and 32.1 mg/dL respectively. Mean VLDL levels among the periodontitis patients and the healthy controls were found to be 35.6 mg/dL and 34.1 mg/dL respectively. On comparing statistically, it was seen that mean HDL levels and mean VLDL levels were non-significantly altered in periodontitis patients. Penumarthy S et al evaluated the effect of periodontal infection on serum levels of triglycerides (TGL), total cholesterol (TC), high-density lipoprotein (HDL) cholesterol, and low-density lipoprotein (LDL) cholesterol. A sample of 90 subjects; 30 periodontally healthy individuals, 30 chronic gingivitis cases (n=30), and 30 chronic periodontitis cases (n=30) with an age range of 25 to 65 years were included in the study. Periodontal parameters including Plaque Index, Gingival Index, Probing Depth, and Clinical Attachment Level were recorded. Venous blood samples were obtained after 12 hours fasting period from antecubital vein and serum levels of TGL, TC, HDL, and LDL cholesterol were measured. The levels of TGL, TC, and LDL cholesterol were significantly higher for periodontitis group as compared to gingivitis and periodontally healthy groups. HDL cholesterol levels were significantly lower in periodontitis group as compared to periodontally healthy and gingivitis groups. The results of the present study indicate that periodontal infection has a definite role in altering lipid metabolism leading to hyperlipidemia.[11] Lal V et al assessed the correlation between serum lipid profile and periodontitis. The levels of serum lipid profile in 60 subjects, 30 with chronic generalized periodontitis based on clinical attachment loss (CAL) constituting the test group and 30 without periodontitis constituting the control group, were measured and compared with each other. Both these groups were free from other systemic illnesses. Statistical Analysis: The mean CAL was positively correlated with serum low-density lipoprotein (LDL) cholesterol ($P < 0.01$). The mean serum LDL cholesterol (126.62) and total cholesterol (173.32) in periodontitis patients were found to be significantly higher as compared to that of the controls. The mean CAL (5.32 mm) was positively correlated with serum LDL cholesterol. The frequency of persons with pathologic values of LDL cholesterol and total cholesterol was significantly higher in periodontitis patients compared with that of the controls. These results showed that high serum LDL cholesterol and total cholesterol may be associated with periodontitis in otherwise healthy people.[12] Koshy BS et al compared the demographic variables, Gingival Index(GI), Bleeding On Probing (BOP), Probing Pocket Depth (PPD), and Clinical Attachment Level (CAL) with serum lipid profile and Lp-PLA2 level in Chronic Periodontitis (CP) subjects. A total of 75 subjects were selected and divided into three groups; based on the inclusion and exclusion criteria: Group I - 25 subjects with severe generalized CP with CAL $\geq$ 5 mm in more than 30% of sites. Group II -25 subjects with moderate generalized CD with clinical CAL 3 mm-4 mm in more than 30% of sites. Group III- 25 systemically and periodontally healthy volunteers who served as control. Clinical parameters such as Plaque Index (PI), BOP, Probing Depth (PD) and CAL, lipid profile such as Total Cholesterol (TC), Triglyceride (TG), High density Lipoprotein (HDL), Low Density Lipoprotein (LDL), Very Low Density Lipoprotein (VLDL) as well as Lp-PLA2 were assessed. Age was higher in Group I and II when compared to Group III. Group II showed a significant correlation between PI and LDL. In Group III, lower PI was significantly correlated with high HDL and low LDL and BOP was positively correlated with TG and HDL. A significant association of Lp-PLA2 was found to be higher with increase in the TG and VLDL level in Group I and Group II when compared to Group III. The study concluded that Lp-PLA2, TG and VLDL already being a predictor biomarker for atherosclerotic disease can be an inflammatory marker for periodontitis.[13]

CONCLUSION

From the above results, the authors concluded that mean lipid profile of the periodontitis patients is significantly raised in comparison to healthy controls.

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