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SERUM TRIGLYCERIDE LEVELS A SIGNIFICANT RISK FACTOR FOR PERIODONTAL DISEASE .

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ABSTRACT

Introduction Today's era of evidence based dentistry provides an excellent environment to examine a possible correlation between oral and systemic disease.

Aims &objective Aim of the study is to determine whether an association exists between triglyceride levels and periodontal disease.

Material &method The subjects included in the study were divided into 2 groups .

Group A : chronic periodontitis

Group B : Control Group .

BMI was recorded for both the groups. 3ml of venous blood was collected from the groups following an overnight fast . The samples were send to the Laboratory for estimation of serum triglyceride.

Results The mean Triglyceride level for group A was significantly higher than compared to the control group (group B).

Conclusion The present study indicates that increased serum Triglyceride levels was positively associated with sever periodontal disease and might be a potential maker of periodontal disease .

Key words Cardio vascular disease, Periodontal disease, Triglyceride level , Body mass index

INTRODUCTION

Advances in science and technology over the last century have greatly expanded our knowledge on the pathogenesis of periodontal disease. Today's Era of evidence based dentistry provides an excellent environment to examine a possible correlation between oral and systemic diseases.

Cardiovascular disease, which is primarily associated with atherosclerosis remains one of the primary cause of death worldwide. Age, Male gender, Smoking, Systemic hypertension, Plasma Fibrinogen levels, White blood cell count, Diabetes Mellitus and Hypercholesteremia are the major risk factors for Cardiovascular disease. Periodontitis and Cardiovascular disease share common risk factors like: Age, Gender, Smoking, Diabetes Mellitus, Behavioural Factors.

Certain Systemic disease may affect the initiation and progression of gingivitis and periodontitis. These alterations may manifest clinically as early onset of periodontal destruction than that would occur in the absence of systemic disease.

Triglycerides are chemical forms in which most fats exist in food as well as in the body. Triglycerides in the plasma are derived from fats eaten in foods or made in the body from other energy sources like Carbohydrates. Increased plasma level of low density lipoprotein, cholesterol and triglycerides are the major risk factor for periodontal disease. Early studies have indicated that a short term high fat diet results in prolonged impairment in the antibacterial function of polymorphonuclear leucocytes. Activated PMNs have been linked to damage the periodontal tissues, heart valves, lungs and kidney.

Thus chronic hyperlipidemic state may impair the host resistance to bacterial infection and subjects with periodontal disease are at a higher risk for cardiovascular disease.

AIM

Thus the aim of the study is to determine whether an association exists between triglyceride levels and periodontal disease status.

MATERIAL AND METHOD

A total of 40 patients both male and females reporting to the Department of Periodontics K.L.E.S VK Institute of Dental Sciences Belgaum were included in the study.

SAMPLE SELECTION

INCLUSION CRITERIA

- Patients age group between 45 to 75 yrs
- Patients suffering from Chronic Periodontitis (pocket depth of >6mm and bone loss >30% in at least 10 teeth according to World Work Shop 1999 classification of periodontal disease) (figure a)

EXCLUSION CRITERIA

- Pt suffering with any systemic disease like : Diabetes Mellitus ,Endocrine disease , Hypertension
- Smokers
- Pt on any medication like : Antihypertensive drugs ,Antiepileptic drugs ,Antibiotics
- Pregnant and lactating mothers
- Pt who have undergone periodontal therapy for the last 6 months

METHODOLOGY

Ethical clearance from KLE ,S VK Institute of Dental Sciences was obtained for the study. The subjects included in the study were divided into 2 groups:

Group A: Chronic Periodontitis : Disease group (figure b)

Group B: Healthy : Control Group

The Body mass index (BMI) is a statistical measure which compares a person's weight and height. Body mass index is defined as the individuals body weight divided by the square of his or her height. The formulae universally used in medicine produce a unit of measure of Kg/m^2

For both the disease and control group the BMI values was recorded. For group A or disease group the periodontal findings were recorded

3 ml of venous blood was collected from both the group following an overnight fast. Samples were sent to the laboratory for estimation of serum triglyceride levels.

(figure c) (figure d) (figure e)

RESULT

MEAN AGE OF DISEASE AND CONTROL GROUP

Table 1	**AGE: (mean±SD)**
Disease group	46.9±8.03
Control group	44.4±10.05

* t = 0.869, df (Degree of freedom) = 38, p = 0.391

*p value not statically significant

There was no difference between the mean age group of disease and control group.

PERCENTAGE OF MALE AND FEMALES INCLUDED IN THE STUDY

Table 2	**Male%**	**Female%**	**total**
Disease group	14(70%)	6(30%)	20
Control group	11(55%)	9(45%)	20

*X^2 = 0.961, df = 1, p = 0.327

*p value not statically significant

MEAN BMI VALUES OF DISEASE AND CONTROL GROUP

Table 3	**BMI values (mean±SD)**
Disease group	21.2±1.85
Control group	21.1±1.71

*t = 0.090, df = 38, p = 0.929

*p value not statically significant The mean BMI values were almost the same for both the group

MEAN TRIGLYCERIDE VALUE OF DISEASE AND CONTROL GROUP

Table 4	**Triglyceride levels (mean±SD)**
Disease group	181±48.69
Control group	119±7.92

*t = 5.644, df = 38, p < 0.001

*p value statically significant

The mean triglyceride level for the disease group was significantly higher compared to the control group. P value < 0.001 was statically significant. None of the other variables were significantly different between the control and disease group.

RELATING INDIVIDUALS WITH HIGH TRIGLYCERIDE LEVELS WITH NORMAL LEVELS

Table 5

Triglyceride levels	60 -150	>150	Total
Disease group	6	14(70%)	20
Control group	20	0	20
Total	26	14	40

*Chi –Square correction = 18.5% df = 1 p= 0.00016

In the disease group the number of patients with high triglyceride level >150 included about 70% of the total number . Thus stating that patients with High Triglyceride levels had more periodontal destruction .

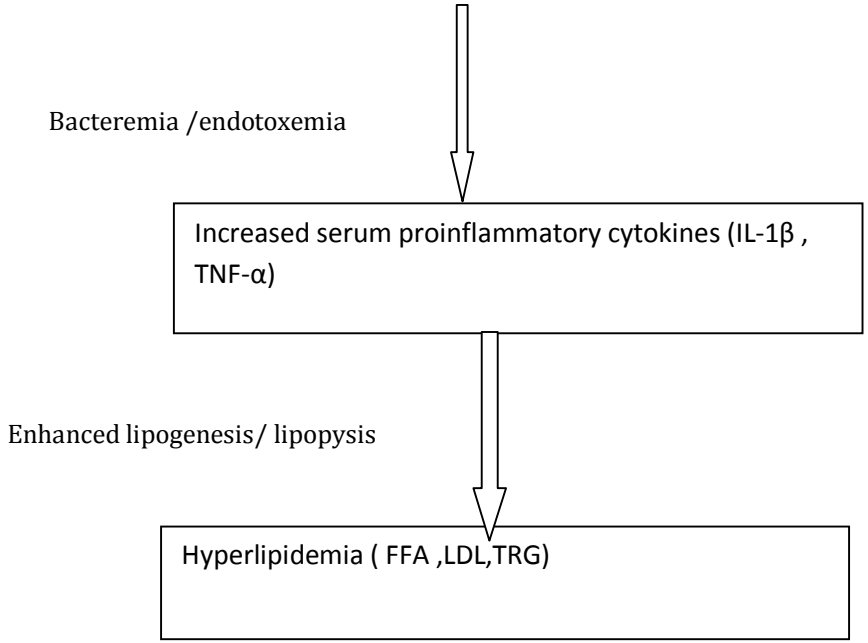
DISCUSSION

Hyperlipidemia is a state of abnormal lipid profile which is characterized by elevated blood concentration of triglyceride ,blood cholesterol and decreased levels of high density lipoprotein (HDL). Lipids interact directly with the macrophage cell membrane ,interfering with membrane bound receptor and enzyme systems ,altering macrophage gene expression essential for polypeptide growth factor and pro inflammatory cytokines such as tumour necrosis factor alpha and interleukin 1 β which are associated with periodontal disease . Hyperlipidemia may be more important than hyperglycaemia relative to hyperresponsive monocyte macrophage phenotype.[7] Hyperlipidemia is known to cause hyperactivity of white blood cells .Hyperactive white blood cell cause increased production of oxygen free radical, which is associated with progression of periodontitis.

The patients included in our study were within the normal BMI ranging from 18.5 to 22.9 normal weight according to WHO classification 2000. The study revealed that there was no significant association between the mean Age and BMI values of the disease and control group . (table I and II). Obesity has been suggested to be a risk factor for periodontitis(Saito et al 2001). The adverse effects of obesity on the periodontium might be mediated through impaired glucose tolerance, dyslipidemia or through increased levels of various bioactive substances secreted by adipose tissue (Saito & Shimazaki 2007). There exist a causal relationship between obesity and periodontitis . This elucidate the role of altered lipid profile in the pathogenesis of periodontitis.[3] Hyperlipidemia often co exist with obesity (Koplema 2000) and hyperlipidemia has been suggested to be one possible mechanism explaning the association between obesity and periodontitis (Saito and Shima Zaki).

The result of our study revealed that the mean triglyceride level were significantly higher for the disease group than compared to the control group (Table III). Chronic local and acute systemic infections has demonstrated to induce profound change in the plasma concentration of cytokines and hormones leading to a catabolic state characterized by altered lipid metabolism . The main feature of this altered metabolism is hypertriglyceridemia and lipid oxidation .

Infection (chronic localized periodontitis)



This suggest that even in localized oral infection such as periodontitis , there exist a potential for chronic low level systemic exposure to micro organism / lipopolysaccaride leading to generalized alteration in lipid metabolism [8]. The study also revealed that 70% of patients (14 out of total 20 patients) had high triglyceride levels >150 (Table IV).Thus stating that there exist a positive correlation between high triglyceride level and periodontal disease status. Chronic hyperlipidemic state may impair the host resistance to bacterial infections ,thus promoting the destruction of cardiovascular ,pulmonary ,renal and periodontal tissues.[9]

CONCLUSION

In conclusion the present study indicates that increased serum triglyceride levels are positively associated with sever periodontal disease and might be a potential marker of periodontal disease. Longitudinal community based studies are needed to confirm these finding and provide further insight into the link between lipid metabolism and periodontal disease.

LIST OF REFERENCES

1 Michael G Newman ,CARRANZAS Clinical Periodontology 10th edition .

2 Ozlem Fentoglu Periodontal status in subjects with hyperlipidemia J Periodontol 2009 ;80 :267-273

3 www.triglyceride.com

4 Manabu Morita , Masazumi Horiuchi et al Relationship between blood triglyceride levels and periodontal disease status .Community dental health 2004 :21 32-36

5 Christopher W Culter Edward A Shinedling et al Association between periodontitis and hyperlipidemia : cause or effect ? J Periodontol 1999 ;70 1429-1434

6 Saxlin T , Suominen –Taipale l et al Association between serum lipid levels and periodontal infection. Journal of clinical Periodontol 2008 ; vol 35;1040-1047.

7 Ozlem Fentoglu ,et al Periodontal Status in subjects with Hyperlipidemia
J Periodontology 2009; vol 80;267-273.

8 Ylostalo P , Suominen-Taipale L , Reunanen A , Knuuttila M . Association between body weight and periodontal infection. J clinical Periodontolo 2008; vol 35;297-304.

9 Anthony M Iacopino and Christopher W Culter Journal of Periodontol 2000 ; 71 ;1375-1384.

FIGURE a CHRONIC PERIODONTITIS

FIGURE b CLINICAL ARMENTARIUM

FIGURE c COLLECTION OF VENOUS BLOOD

FIGURE d CALORIMETER

FIGURE e VACUTAINOR

LEGENDS

TABLE I MEAN AGE OF DISEASE AND CONTROL GROUP