Correlation Between Periodontal Disease and Diabetes Mellitus.

Sajid Khan Panwar	Ajay Kumar Bhargava	Isha Pandey
Department of Dentistry, Jhalwar Medical College, Jhalawar (Raj.)	Department of Biochemistry, Jhalwar Medical College, Jhalawar (Raj.)	

ABSTRACT *Periodontitis is a disease of inflammation in which periodontal tissue are destroyed and which results to loss of connective tissue attachment and formation of pathological pockets etc.In present study we studied level of Glucose and Lipoproteins(Total cholesterol, LDLc, HDLc ,VLDLc ,Triglyceride).In subjects of Diabetes Mellitus with Periodontitis (DM+Pd), Non Diabetes Mellitus with Periodontitis (NDM+Pd) and Non Diabetes Mellitus with Non Periodontitis(NDM+NPd). A significant correlation (p<.0001) was observed between these parameters when compare with DM+Pd, NDM+Pd, NDM+NPd.*

Introduction-

Periodontitis is characterized by chronic inflammation with destruction of the periodontal tissues and results in loss of connective tissue attachment, formation of pathological pockets around the disease teeth and loss of alveolar bone[1.]

Periodontitis caused by Gram negative micro organism and affects both the gingival and the bone that support the teeth[2.]

Periodontitis is prevalent in developing countries and poor countries. In India periodontal disease affects childhood population and adult population due to poor dental hygiene and negligence of dental care. Diabetes Mellitus (Type-2 insulin dependent) is metabolic x syndrome characterized by lack of function of insulin receptor and it affects 2-10% population all over world.

Material and Methods- We have studied 150 subjects coming to OPD of Dentistry Department of Jhalawar Medical College and SRG Hospital, Jhalawar (Raj.).These subjects divided into three groups –

I- Diabetes Mellitus with Periodontitis (DM+Pd)-50 subjects
II- Non Diabetes Mellitus with Periodontitis (NDM+Pd)-50 subjects
III- Non Diabetes Mellitus with Non Periodontitis (NDM+NPd)-50 subjects

All the information of subjects recorded in self constructed questionnaire.

The study conducted in Department of Dentistry and Biochemistry, Jhalawar Medical College and SRG Hospital Jhalawar (Raj.)

Venous blood samples were collected after overnight fasting.SerumTotalcholesterol[3],SerumTriglyceride[4],SerumHDLc[5] ,Serum LDLc[6], Serum VLDLc[7] were estimated by commercial kit method.

The Data was analyzed by using specific statistical tool (SPSS version 20)

Glucose was estimated by GOD POD Enzymatic Method[8]

Results-

Data obtained in our study revealed that there is an interrelation between blood glucose, lipoprotein i.e. Total Cholesterol, HDLc, LDLc, VLDLc and Triglyceride levels.

Age is not significant with the diabetes mellitus with periodontitis 39.59±8.92 (mean ±S.D.) and non diabetes mellitus with periodontitis it was found 39.67±8.20 (mean ±S.D.), when compared with non diabetes mellitus with non periodontitis 38.27±7.11 (mean ±S.D.)

The level of serum Glucose(fasting) was found to be 140.07±4.81mg/dl(mean ±SD) in diabetes mellitus with periodontitis and in non diabetes mellitus with periodontitis 99.91±3.23mg/dl (mean ±SD) and it was significant correlation when compared with non diabetes mellitus with non periodontitis (<.0001) (table 1).The level of Total Cholesterol was 248.07 ± 10.50mg/dl(mean ±S.D.) in diabetes mellitus with periodontitis and in non diabetes mellitus with periodontitis 257.15±8.88mg/dl and in non diabetes mellitus with non periodontitis 205.81±10.53mg/dl and a significant correlation were obtained when compared (0.000<1)

A significant correlation obtained when comparison between HDLc in diabetes mellitus with periodontitis 34.55±1.93mg/dl, non diabetes mellitus with periodontitis 37.50±2.73mg/dl (mean ±S.D.) (p<0.0001)

LDLc in diabetes mellitus with periodontitis 155.33±3.1 mg/dl in non diabetes mellitus with periodontitis 147.74±3.82 mg/dl and it was found a significant correlation with both above value compared with non diabetes mellitus with non periodontitis 128.47±1.05 mg/dl (p<0.00001) (Table 1)

Triglyceride (mg/dl) (mean ±SD) in diabetes mellitus with periodontitis 161.20±12.88 in non diabetes mellitus with periodontitis 141.33±10.11 mg/dl when non diabetes mellitus with non periodontitis it was 132.62±8.92mg/dl (mean ±SD) and found to be significant (p<0.0001)

VLDLc (mean ±SD) was in diabetes mellitus with periodontitis 32.24±2.5mg/dl , in non diabetes mellitus with periodontitis 28.66±2.02 and in non diabetes mellitus with periodontitis 26.52±1.79mg/dl and it was found to be significant correlation when compared these value (p<0.0001)

Tabel- Correlation between different groups (DM+Pd, NDM+Pd, NDM+Non Pd)

Parameters	Diabetes Mellitus with Peri-odontitis	Non Diabetes Mellitus with Periodontitis	Non Diabetes Mellitus with non Periodontitis	Significance (p value)
Age (years)	39.59±8.92	39.67±8.20	38.27±7.11	0.160
Fasting Glucose (mg/dl)	140.07±4.81	99.91±3.23	80.77±4.84	<0.0001
Total Cholesterol (mg/dl)	248.07±10.50	257.15±8.88	205.81±10.53	<0.0001
HDL Cholesterol (mg/dl)	30.55±1.93	32.50±2.73	38.31±1.41	<0.0001
LDL Cholesterol (mg/dl)	155.33±2.61	147.74±3.82	128.47±1.05	<0.0001
Triglyceride (mg/dl)	161.20±12.88	141.33±10.11	132.62±8.97	<0.0001
VLDL Cholesterol (mg/dl)	32.24±2.57	28.26±2.02	26.52±1.79	<0.0001

DM=Diabetes Mellitus, NDM=Non Diabetes Mellitus, Pd=periodontitis

Discussion –

Periodontitis in people with Diabetes is important in diagnosis and in medical management of periodontal disease in present study blood glucose and lipid level in Diabetes Mellitus with periodontitis have been studied.

In our study level of glucose increased in Diabetes mellitus with periodontitis and in non Diabetes Mellitus with periodontitis, these values were found significant correlation when compared with non periodontitis with non Diabetes mellitus. Our study similar to reported by earlier workers[9,10,11]. Study of Total cholesterol was significantly correlated with Diabetes Mellitus and periodontitis when compared with non Diabetes Mellitus and non periodontitis population.

These results are similar to finding reported in literature[12,13] level of HDL Cholesterol were found to be significantly correlation between Diabetes Mellitus with periodontitis and non Diabetes Mellitus with periodontitis and non diabetes mellitus with non periodontitis.

Our results compared with reported in literature and similar results found[14]. LDL cholesterol and Triglyceride and VLDL reduced in Diabetes Mellitus with periodontitis and non Diabetes mellitus with periodontitis. A significant correlation was observed between their levels in Diabetes mellitus with Periodontitis prone to elevated LDL cholesterol and triglyceride levels and Hyperlipidemia may be one of the factor associated with diabetes induced immune cell alteration[15,16].

Periodontitis induced endotoxiemia and it is responsible for increased level of cytokines such as interleukin (IL-B-1) and tumor necrosis factor (TNF-α)and which leads to development of alteration in lipid metabolism periodontitis is responsible[17,18,19] cytokines may develop insulin resistance and similar to Diabetes Mellitus and which may be destroy Beta cell of pancreatic cells which leads to development of Diabetes Mellitus[20,21].

Conclusion-

Diabetes Mellitus is a life threatening metabolic syndrome and Periodontitis is a infectious disease and responsible for destruction of systemic physiology not only in diabetic patients but also in non diabetic population all over the world. In present study we concluded that hyperglycemia and hyperlipidemia in Diabetes Mellitus with Periodontitis and Non Diabetes Mellitus with Periodontitis are important parameter in diagnosis, prognosis and management of both Diabetes Mellitus and periodontitis.

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