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ASSOCIATION OF DIABETES MELLITUS AND PERIODONTITIS

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ABSTRACT

Background: Diabetes mellitus is a part of metabolic X syndrome, progression may be dangerous and its association with periodontal disease is important in diagnosis and medical management of both disease. **Material and Method:** In present study we have determined HbA1c and Glucose level in diabetes mellitus with periodontitis, diabetes mellitus without periodontitis and non-diabetes mellitus with non-periodontitis by commercial kit method on fully automated Beckmann coulter analyzer on cases coming to SRG hospital and Jhalawar Medical College, Jhalawar (Raj.). **Results:** we found in non-diabetes with non-periodontitis HbA1c level is 4.40+-1.10 and glucose 87.58+-2.12, in diabetes with periodontitis HbA1c is 6.89+-1.55 and glucose 132.30+-5.2, in non-diabetes with periodontitis HbA1c is 5.10+-1.20 and glucose is 92.72 +-3.22 where p value is <.001.**Conclusion:** Present study concluded that diabetes mellitus and periodontal disease are both interrelated and important in diagnosis and prognosis and management of periodontal disease and diabetes mellitus.

Key words: Diabetes mellitus, Periodontitis, HbA1c, Glucose

INTRODUCTION

Diabetes mellitus is a disorder of carbohydrate metabolism and hyperglycemia takes place for prolonged time; it is called metabolic X syndrome. Periodontitis also known as periodontal disease and disease of gum (pyorrhea) which is defined as inflammation occur which affect other tissues surrounding the teeth and if not treated it may cause loss of teeth due to progressive loss of the alveolar bone. Association between diabetes and periodontitis disease reported in literature **(1)**.

Estimation of glycosylated hemoglobin (HbA1c) in blood give a picture about an individual average blood glucose value during previous three month; however significance of HbA1c test in diagnosis prognosis of diabetic patients with periodontitis **(2)** Study of periodontitis in subjects of diabetes are important due to their correlation not only diagnosis but also prognosis and management of both disease i.e. periodontal and diabetes specially diabetes mellitus[3]. In present study we have determined estimation of glycosylated hemoglobin (HbA1c) and glucose in patients of periodontal disease with diabetes mellitus and without diabetes mellitus.

MATERIAL AND METHOD

We have studies 150 subjects divided into three groups. In A group 50 subjects of diabetes mellitus with periodontitis, 50 in group B of non-diabetes mellitus with periodontitis and 50 in group C of non-diabetes mellitus with non-periodontitis.

Present study was (case control trial) conducted in patients coming to OPD of dentistry department was selected for this study and biochemical parameters estimation was done in department of biochemistry

SRG hospital Jhalawar Medical College Jhalawar (Raj.). History of subjects recorded in self conducted questionnaire. Venous blood sample collected after overnight fasting condition for glucose estimation.

Glycosylated hemoglobin (HbA1c) was estimated by kit method on Beckman coulter auto analyzer by turbid metric immunoinhibition method[4].Glucose was estimated by glucose GOD-POD kit method[5] of enzymatic analysis. Ethical permission have been taken from Jhalawar Medical College ethical committee for present research work.

REFERENCE RANGE:

HbA1c – 4 - 6.2 %

Glucose - 70 – 110 mg % (Fasting)

RESULTS

We have observed in present study that association between HbA1c and glucose level in periodontal disease and diabetes mellitus in different age group. Age was not a significant factor in our study in all three groups (Diabetes mellitus with periodontitis, Non diabetes mellitus with periodontitis and Non diabetes mellitus with non-periodontitis) (Table 1).

The level of HbA1c (mean +-S.D) was found to be 6.89+-1.55 in diabetes mellitus and periodontitis, 5.10+-1.20 in non-diabetes mellitus with periodontitis and was found significant correlation when compared with non diabetes mellitus with non-periodontitis (4.40+-1.10)($p<.001$).

The level (mean +- S.D) of glucose (fasting)was found to 132.23+-5.21 in diabetes mellitus with periodontitis, 105+-4.80 in non-diabetes mellitus with periodontitis when compared with non diabetes mellitus and non periodontitis (92.72+-3.22) it was found to be significant ($p<.001$) (table 1)

Table 1.Mean +- S.D level of diabetes mellitus with periodontitis, non diabetes mellitus with periodontitis and compared with non diabetes mellitus with non periodontitis.

Table 1

Biochemical parameter	Non diabetes with non periodontitis	Diabetes with periodontitis	Non diabetes with periodontitis	Significance (p value)
HbA1c(%)	4.40+-1.10	6.89+-1.55	5.10+-1.20	<.001
Glucose(mg/dl)	87.58+-2.12	132.30+-5.2	92.72+-3.22	<.001

Table 2- Reference range (Normal)

Parameter	Range
HbA1c	<6 %
Glucose (fasting)	70-110 mg/dl

DISCUSSION

The association between periodontal disease and diabetes mellitus demonstrated oral infection and systemic disease and these factor play important role in development and prognosis of thedisease[6]andthere is correlation with diabetes mellitus and periodontitis;and physiological and biochemical changes coexist in both diseases.

Inflammation, and immune cell phenotype, blood lipid levelsand tissue homeostasis are significant factors indiabetes induced changes incell function which produce an inflammatory immune cell phenotype in periodontitis also .Proinflammatory markers such as cytokines produced by growth factors and polymorph nuclearcell from macrophagesare key regulatory risk factors not only

in periodontitis but also in diabetes mellitus **(7)** However, intensive glucose-control measures decrease the HbA1c levels which in turn considerably reduce the risk for developing diabetes complications[8]. Earlier reports which supports the use of HbA1c as a diagnostic test for diabetes with HbA1c > 6.5 % recommended as the cut off point for diagnosing diabetes.In present study level of HbA1c and glucose was found significant correlation with diabetes with periodontitis and non-diabetes with non periodontitis when compared to healthy control groups because HbA1c level is significantly higher in diabetic with periodontitis subjects compared with healthy subjects which is similar to other studies **(9,10,11)**

CONCLUSION

Periodontitis and diabetes mellitus are interrelated disease. Prevalence of periodontitis in diabetes patients is high and more in those with poorly glycemic control. Diabetes mellitus play a significant role in the initiation and progression of periodontitis and involved poorly metabolic control and extended duration of diabetes mellitus is a risk factor for periodontal disease. Present study concluded that HbA1c and glucose values are important in diagnosis, prognosis and medical management of diabetes mellitus and periodontal disease'

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