



PREVALENCE OF PERIODONTAL DISEASES IN DIABETIC POPULATION IN THENI DISTRICT

Dental Science

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ABSTRACT

Periodontal disease is a chronic inflammatory disease of the tissues that attach and support the teeth to the Jaws. Bacterial plaque is the initiating process of periodontal diseases. In uncontrolled diabetes there will be defective granulocyte chemotaxis, phagocytosis and microbicidal activity. Hence diabetes considered being risk factors for periodontitis and periodontics increases the complications of diabetes. Also periodontal disease is considered to be microvascular complication of diabetes and it had been proposed as a sixth diabetic complication. In this study to assess the prevalence of periodontal diseases in diabetic patients, assess the severity of periodontal disease in relation with level of hyperglycemia and compare the periodontal status in diabetics and non-diabetics.

KEYWORDS

Diabetic Mellitus, Periodontal disease, PI, GBI, RPI

INTRODUCTION

Periodontitis is a common chronic inflammatory disease characterized by destruction of the supporting structures of the teeth mainly the periodontal ligament and alveolar bone (Loe, 1993 and Preshaw, 2008). The susceptibility to periodontitis is significantly increased when their diabetes is poorly controlled, particularly if they also smoke (Preshaw et al., 2012). Recent epidemiologic evidence shows that the prevalence of periodontitis in patients with diabetes is significantly greater (by two times) than in people without periodontitis (Chavarry et al., 2009). The periodontium is richly vascularised end organs similar to respects to the retina and the glomerulus (Saremi et al., 2005).

There is emerging evidence to support the existence of a two-way relationship between diabetes and periodontitis with diabetes increasing the risk for periodontitis and periodontal inflammation negatively affecting glycemic control. Prove the relationship between diabetes mellitus and periodontal diseases by taking the Russell's periodontal index score for diabetic patients (Russell, 1956). Since there is direct relationship with the glycemic status in diabetic individual and periodontal disease, Studies says that there is direct relationship with periodontitis and macro-vascular complication of diabetes (Beck et al., 1998). If we identify and treat periodontitis along with diabetes, to reduce the macro-vascular complications of diabetes like coronary artery disease, cerebrovascular disease and peripheral arterial disease (Teeuw et al., 2010).

MATERIALS AND METHOD

This randomized control study was conducted in Govt. Theni Medical College and Hospital. Theni, Tamilnadu in a rural population. Patients attending dental outpatient (OP) department with periodontal problems were included and their blood glucose values and other blood parameters were estimated. Study includes 100 diabetic patients and 50 non-diabetic patients with dental problem were selected. The study conducted from January 2024 to Dec 2024.

Inclusion Criteria

Age > 12 years and patients with periodontal diseases.

Exclusion Criteria

Patients with other chronic medical illness like Chronic kidney disease, Liver dysfunction, Renal disorders, Malnutrition and Chronic infections.

Smokers, tobacco users and Alcoholics and Pregnant patients

Patients were tested with fasting blood sugar (FBS), post prandial blood sugar (PPBS), urea, creatinine, urine albumin, HbA1c level. Periodical dental examinations were done in the initial visit and after six months of follow up with glycemic management.

All the patients were examined and the following parameters were enrolled

- Plaque Index (PI) according to the criteria of Silnes (1941)
- Gingival Bleeding Index (GBI)
- Russell's Periodontal Index (RPI)

RESULTS

Out of 100 diabetic patients 57% were males and 43% were females, 6% were less than 20 years age group, 17% were in 21-40 years age group, 63% were in 41-60 years age group, 14% were more than above 60 years age group (Table. 1). FBS, PPBS, HbA1c levels were assessed at the initial visit as baseline and after six months of the study. Plaque Index, Gingival Bleeding Index, RPI were assessed at baseline as well as at the end of six months treatment of hyperglycemia (Table. 2 & Figure. 1).

Table. 1. Survey on the prevalence of periodontitis among the diabetic and non-diabetic patients.

	Diabetic Patients (%)	Non-Diabetic Patients (%)
Male	57	26
Female	46	24
Age <20	6	2
21-40	17	18
41-60	63	26
>60	14	4

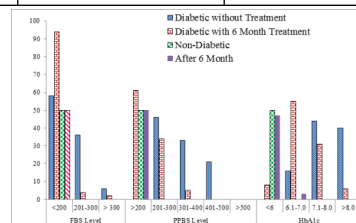
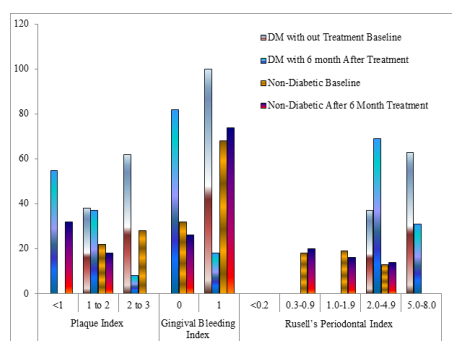


Figure. 1. FBS, PPBS, HbA1c levels of hyperglycemia patients.**Table. 2.** Shows FBS, PPBS, HbA1c levels and Plaque Index, Gingival bleeding index and Russell's Periodontal Index of hyperglycemia patients.

Parameters	Diabetic without Treatment	Diabetic with 6 Month Treatment	Non-Diabetic	After 6 Month
FBS Level				
<200	58	94	50	50
201-300	36	4	0	0
> 300	6	2	0	0
PPBS Level				
>200	0	61	50	50
201-300	46	34	0	0
301-400	33	5	0	0
401-500	21	0	0	0
>500	0	0	0	0
HbA1c Level				
<6	0	8	50	47
6.1-7.0	16	55	0	3
7.1-8.0	44	31	0	0
>8.0	40	6	0	0
Plaque Index	Baseline		After Treatment	
	<1	0	<1	55
	1-2	38	1-2	37
	2-3	62	2-3	8
Gingival bleeding index	Baseline		After Treatment	
	0	1	0	1
	0	100%	82%	18%
	0	100%	82%	18%
Russell's Periodontal Index	Baseline		After Treatment	
	<0.2	0	<0.2	0
	0.3-0.9	0	0.3-0.9	0
	1.0-1.9	0	1.0-1.9	0
	2.0-4.9	37	2.0-4.9	69
	5.0-8.0	63	5.0-8.0	31

Poorly controlled diabetic patients had higher prevalence, severity and progression rate of periodontal disease compared with adequate glycemic control patients and non-diabetic population. Higher fasting glucose levels had a significant role in PPD, PI, GBI and RPI (Table. 2 & Figure. 2).

**Figure. 2.** Plaque Index, Gingival bleeding index and Russell's Periodontal Index of Diabetic and Non-Diabetic population

DISCUSSION

There is strong evidence that diabetes is a risk factor for gingivitis and periodontitis and the level of glycemic control appears to be important determinant in this relationship. The gingival alteration in the diabetics could be the result of diabetic changes that alter tissue response to bacterial insults. The results in our study concerning the attachment loss showed significant difference between the diabetics and control population. Diabetic patients with poor glycemic control are at greater risk for progression of periodontal dislocation over time and are more likely to have severe periodontitis than those with adequate glycemic control. Both treatment of diabetes and periodontal disease simultaneously plays role in preventing the disease progression.

Statistical Analysis

All parameters were recorded with recommended probing pressure, using Williams Graduated Periodontal Probe. All readings were done by two examiners (periodontists) with the help of an assistant for recording. Data was analysed by statistician using SPSS program. Comparison between case and control were done using 't' test and the significance level was pre-decided at the 5%.

CONCLUSION

Periodontal diseases are more prevalent and severe in patients with diabetes mellitus. Diabetes is major risk factors for periodontitis. Treatment of periodontitis in diabetes population results in significant reduction in HbA1c and thus better glycemic control. Adequate glycemic control also provides better reduction in periodontal inflammation. So simultaneous treatment of both hyperglycemia and periodontal disease provides better reduction in disease morbidity.

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