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# Original Article

## Evaluation of Periodontal Status in Diabetic Patients- A Clinical Study

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***ABSTRACT*:**
**Background:** Diabetes mellitus is a metabolic disorder characterized by hyperglycemia due to defective secretion or activity of insulin. The present study was conducted to assess periodontal status in diabetics. **Materials & Methods:** The present study was conducted on 45 diabetics and 45 controls in the age range 25-50 years of age of both genders. Patients were divided into 2 groups. Group I had 45 diabetics and group II had non- diabetics. All patients were assessed for gingival index and bleeding on probing index and CAL at baseline, after 3 months and 6 months. **Results:** The mean± SD gingival index at baseline was 2.5 in group I and II, 2 and 1.2 in group I and II respectively at 3 months and 1.6 and 1 in group I and group II at 6 months. The difference was significant (P< 0.05). The mean± SD BOP at baseline was 2 in group I and II, 1.8 and 1.4 in group I and II respectively at 3 months and 1.4 and 1 in group I and group II at 6 months. The difference was significant (P< 0.05). The mean± SD CAL was 6 mm in group I and 4 mm in group II at baseline, 4 mm and 2 mm at 3 months and 3 mm and 1.2 mm at 6 months in group I and group II respectively. The difference was significant (P< 0.05).
**Conclusion:** There is higher chances of periodontal and gingival diseases in diabetics than non- diabetics. The gingiva index, BOP index and CAL is more in diabetics than non- diabetics.
**Key words:** Diabetes, Gingival, Periodontal

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### INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia due to defective secretion or activity of insulin. A diagnosis of diabetes mellitus is made by assessing glycated hemoglobin levels; in those people with diabetes, sequential fasting plasma glucose levels will be 7 mmol/L or more. The causes of type 2 diabetes mellitus range from insulin resistance with relative insulin deficiency to a predominantly secretory defect accompanied by insulin resistance. The onset is generally more gradual than for type 1, and this condition is often associated with obesity. In addition, the risk of type 2 diabetes increases with age and lack of physical activity, and this form of diabetes is more prevalent among people with hypertension or dyslipidemia.[1] Type 2 diabetes and periodontal disease are chronic diseases with complex etiopathogenesis. This has led to difficulties in interpreting the relationship of these diseases.[2] The association of these two chronic diseases has been studied in various populations. Most of these studies reported that the prevalence of periodontal disease is high and more severe in diabetics than in non-diabetics. This occurrence is worse if the diabetics have poor glycaemic control. One study reported no difference in periodontal status between metabolically controlled diabetics and non-diabetics.[3] The present study was conducted to assess periodontal status in diabetics.

### MATERIALS & METHODS

The present study was conducted in the department of Periodontics and Oral Medicine and Radiology. It comprised of 45 diabetics and 45 controls in the age range 25-50 years of age of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

General information such as name, age, gender etc. was recorded. In all patients, glycosylated hemoglobin level was assessed. Patients were divided into 2 groups. Group I had 45 diabetics and group II had non- diabetics. All patients

were assessed for gingival index and bleeding on probing index and clinical attachment loss (CAL) at baseline, after 3 months and 6 months. OPG was done to determine the level of bone loss in both groups. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

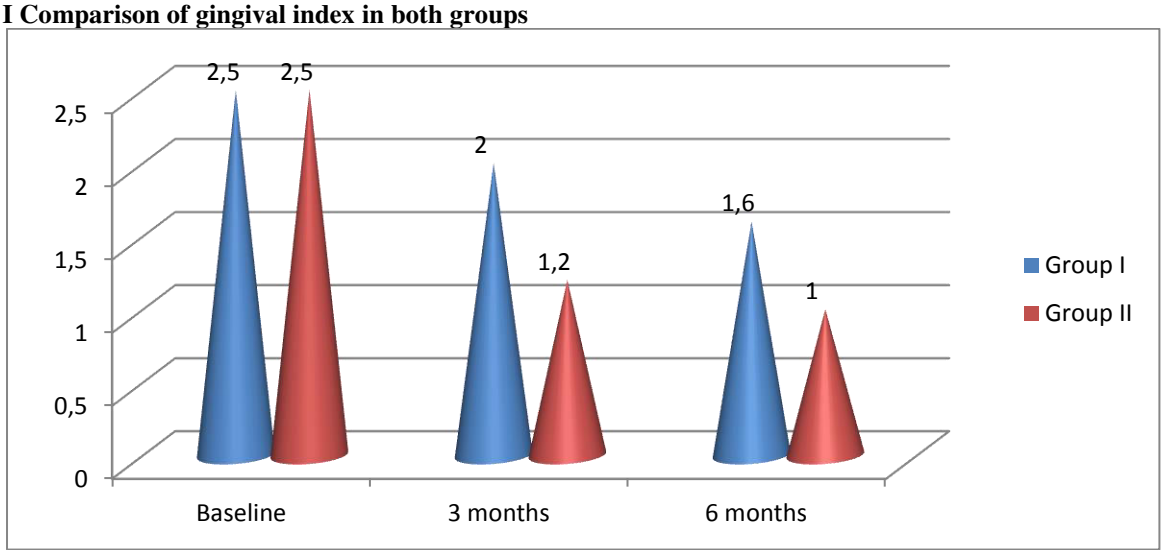
## RESULTS

**Table I Distribution of patients**

| Total- 90 | | | | P value |
|---|---|---|---|---|
| Group I (Diabetics) | | Group II (Non- diabetics) | | |
| Males | Females | Males | Females | |
| 25 | 20 | 22 | 23 | 0.61 |

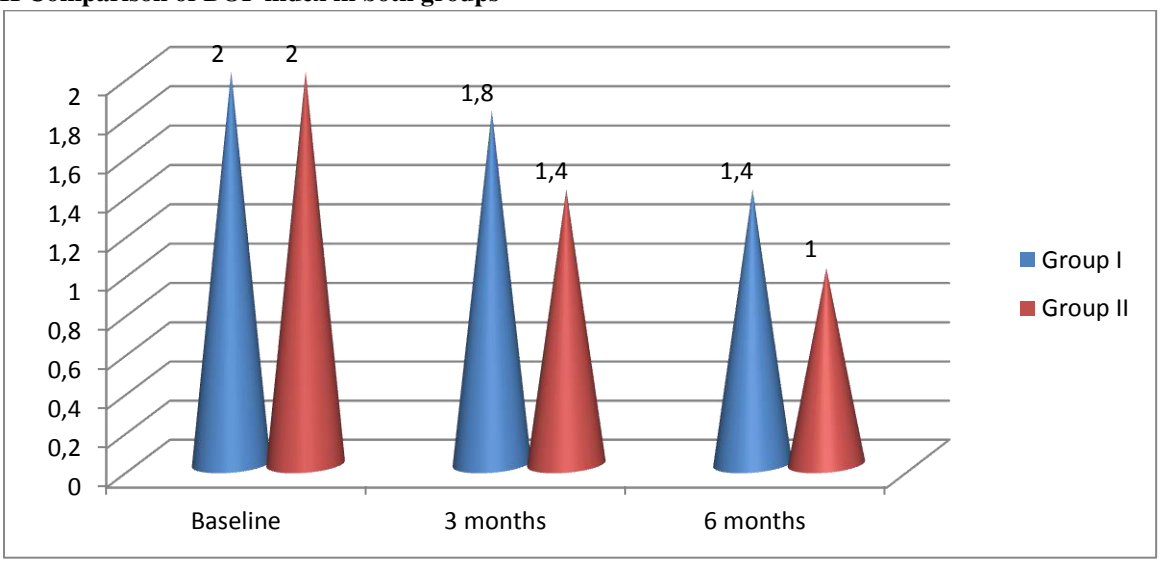
Table I shows that group I had 25 males and 20 females and group II had 22 males and 23 females. The difference was non-significant (P> 0.05).

**Graph I Comparison of gingival index in both groups**



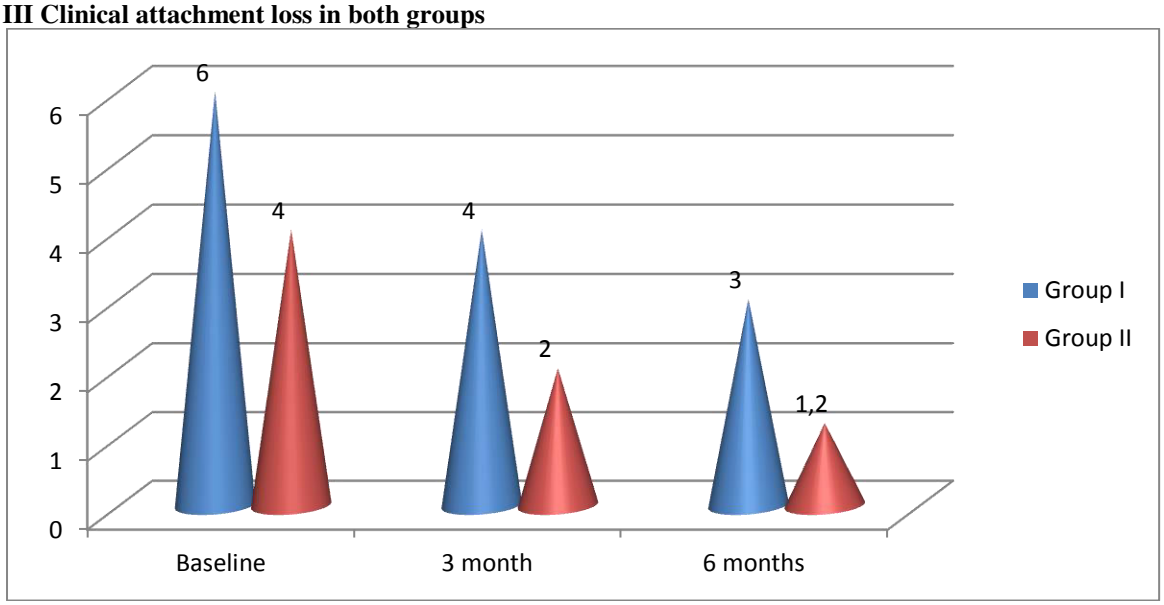

Graph I shows that mean± SD gingival index at baseline was 2.5 in group I and II, 2 and 1.2 in group I and II respectively at 3 months and 1.6 and 1 in group I and group II at 6 months. The difference was significant (P< 0.05).

**Graph II Comparison of BOP index in both groups**



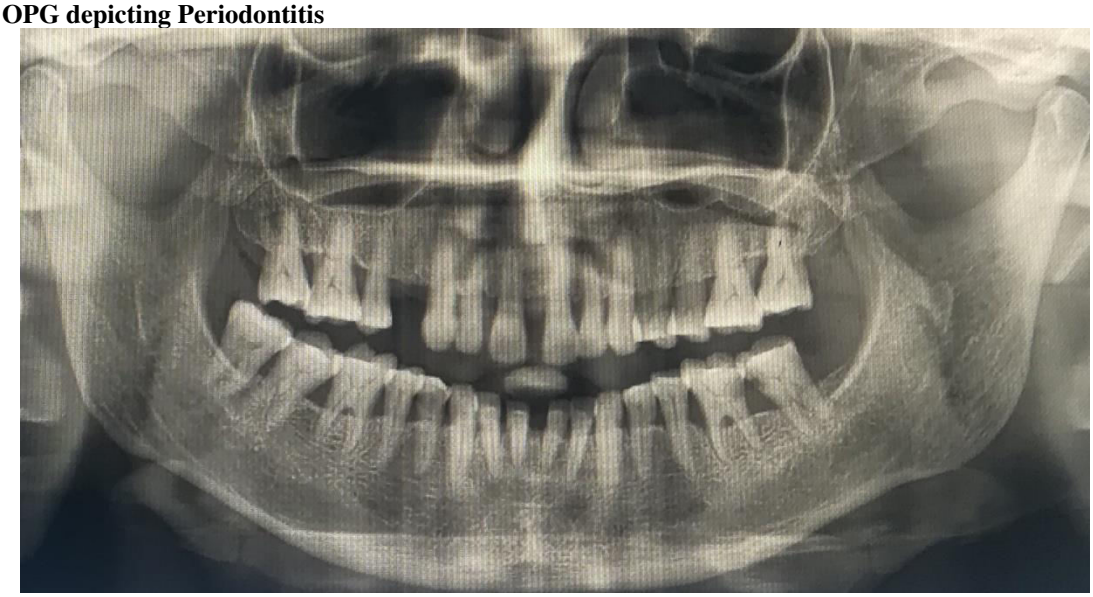

Graph II shows that mean± SD BOP at baseline was 2 in group I and II, 1.8 and 1.4 in group I and II respectively at 3 months and 1.4 and 1 in group I and group II at 6 months. The difference was significant (P< 0.05).

**Graph III Clinical attachment loss in both groups**




Graph III shows that mean± SD CAL was 6 mm in group I and 4 mm in group II at baseline, 4 mm and 2 mm at 3 months and 3 mm and 1.2 mm at 6 months in group I and group II respectively. The difference was significant (P< 0.05).

**Figure 1: OPG depicting Periodontitis**



## DISCUSSION

Periodontitis has been referred to as the sixth complication of diabetes. A number of studies found a higher prevalence of periodontal disease among diabetic patients than among healthy controls. There are several systemic and local factors, that influencing health of periodontium, such as systemic disorders and dental plaque.[4,5] Inadequate control of plaque leads to gingivitis within 1-2 weeks, which is reversible by regular mechanical and chemical plaque control methods such as tooth brushing and mouthwashes.[6] Microbial plaque has a key role in pathogenesis of periodontal diseases, and periodontal diseases are mainly plaque induced bacterial infections. Studies aimed at determining the association between periodontal disease and diabetes mellitus were done among the Pima Indians of United States of America.[7] In present study, we assessed the periodontal status in diabetics.

We included 45 diabetics in group I and 45 non- diabetics in group II. Group I had 25 males and 20 females and group II had 22 males and 23 females. The mean± SD gingival index at baseline was 2.5 in group I and II, 2 and 1.2 in group I and II respectively at 3 months and 1.6 and 1 in group I and group II at 6 months.

In a study by Shlossman et al[8], 67 type 2 diabetics (mean age: 49.3 ± 8.97) and 67 non-diabetics (mean age: 47.6 ± 8.85) were examined. The plaque index (P1I), gingival

index (GI), probing depth (PD) and clinical attachment loss (CAL) were recorded on Ramfjord index teeth or their substitutes. Previous dental care, smoking status, alcohol consumption and socio-economic status were also assessed. Diabetics had significantly higher mean GI (p = 0.001), PD (p = 0.031) and CAL (p = 0.022) than non-diabetics. The mean P1I (p = 0.531) was not significantly different between the two groups. This study showed that diabetics had more severe and a higher prevalence of periodontal disease.

We also assessed BOP index. The mean± SD BOP at baseline was 2 in group I and II, 1.8 and 1.4 in group I and II respectively at 3 months and 1.4 and 1 in group I and group II at 6 months. This is similar to Tsai et al.[9] They examined 50 young people with IDDM and 50 healthy subjects. Mean age of examined persons was about 14 years. Authors investigated gingival indexes: GI (Gingival Index) and PBI (Papillary Bleeding Index) and periodontal indexes: PI (Periodontal Index) and PDI (Periodontal Disease Index). The mean scores of Gingival Index and Papillary Bleeding Index were lower in healthy subjects but differences were not statistically significant. Only maximum scores of these indexes were significantly higher in diabetics. The mean and maximum values of Periodontal Index were significantly higher in patients with IDDM.

Present study assessed bone loss using OPG images. Zardawi et al[10] in their study observed 347 OPG images which revealed that 30.2% of the total images showed bone loss at one site or more. 14.6% of the images revealed bone loss at 1-3 sites, whereas, 15.6% demonstrated bone loss at more than 3 sites. Percentage of bone loss was significantly higher (P=0.001) among group two (24-30 years old group) than group one (17-23 years old group) 38% against 25% respectively. Female's radiographs recorded a non-significantly higher (P>0.05) bone loss than male's radiographs 31.7% against 28.7% respectively. OPG images have certain limitations i.e. they lack of clarity for interpreting the interseptal bone at the maxillary and mandibular anterior regions and crowding teeth have an influence on the overall reliability and sensitivity of the method.

We found that mean± SD CAL was 6 mm in group I and 4 mm in group II at baseline, 4 mm and 2 mm at 3 months and 3 mm and 1.2 mm at 6 months in group I and group II respectively. Recent researches have attempted to establish if the presence of periodontal disease influences the control of diabetes. There appears to be good evidence to support this hypothesis. Grossi and others[11] have suggested that effective control of periodontal infection in diabetic patients reduces the level of AGEs in the serum. The level of glycemic control seems to be the key factor.

## CONCLUSION

There is higher chances of periodontal and gingival diseases in diabetics than non- diabetics. The gingiva index, BOP index and CAL is more in diabetics than non- diabetics.

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