

***Biochemical analysis and periodontal health  
status with tooth loss in type 1 and type 2  
diabetes***

***(Comparative study)***

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# ***Abstract***

**Background:** Diabetes mellitus is a group of metabolic disorders with one common manifestation: hyperglycemia. Diabetic patients have been reported to be more susceptible to gingivitis and periodontitis than healthy subject. Cera reactive protein (C.R.P) is an acute phase protein produced by liver. Serum C.R.P measurement is widely used as bio-marker of inflammation in the body.

**Aim of the study:** To evaluate the periodontal health status in type 1 and type 2 diabetic patients and compared with healthy subjects. Also to evaluate the level of C.R.P in serum and saliva in type1 and type 2 diabetic patients and compared with healthy subjects.

**Material and method:** Total samples composed of eighty participants, the samples were divided to study group (60 diabetic patient) and control group (20 healthy subjects).They were non-smokers male patients of age range 25-55 years old.

Study group sample included:

Group 1: Fifteen patients type 1 diabetes with good control, HbA1c less than 7.5%.

Group 2: Fifteen patients type 1 diabetes with poor control, HbA1c more than 7.5%.

Group 3: Fifteen patients type 2 diabetes with good control, HbA1c less than 7.5%.

Group 4: Fifteen patients type 2 diabetes with poor control, HbA1c more than 7.5%.

The control group sample (group 5) included 20 healthy subjects without any history for any systemic disease.

Periodontal health status was estimated by measuring following clinical parameters:

Plaque index (PL.I)

Gingival index (G.I)

Bleeding on probing (BOP)

Probing pocket depth (PPD)

Clinical attachment level (CAL)

Five to six mls of un-stimulated (resting) whole saliva was collected before the clinical examination and after taking blood samples. The collected saliva was centrifuged at 3000 r.p.m for 15 minutes , clear supernatant saliva kept frozen and store at -20°C for 1 week until C.R.P determination by using avitex aso kit for semi-quantitative determination of C.R.P in saliva.

Blood sample was analyzed for measurement the level of serum C.R.P and HbA1c.

**Result:** The result showed that the mean C.R.P in saliva was higher in study group compared to control group .It was highest in group 4 which was 17.454 mg/ml  $\pm$ 7.802 and lowest in group 5 which was 8.421 mg/ml  $\pm$ 3.464

Inter groups Comparison between type 1 and type 2 diabetes and control group were highly significant .

Percentage of C.R.P in serum was also higher in study group compared to control group. It was 41.17% in group 1; 85.17% in group2; 68.75% in group3; 72.72% in group 4 and 18.75% in group 5.

Inter group Comparison between type 1 and type 2 diabetes and control group were highly significant.

The means of plaque index were higher in group 2, 4 compared with group 1,3,5. It was  $2.12 \pm 0.655$  in group 2 and  $2.07 \pm 0.688$  in group4, while in group 1,3,5 they were  $1.45 \pm 0.529$ ,  $1.9 \pm 0.584$  and  $1.32 \pm 0.512$  respectively.

Inter group comparison between type 1 and type 2 diabetic and control group for plaque index showed that there was no significant difference between type 1 and type 2 of diabetes, there was significant difference between type 1 and control group and there was a highly significant difference between type 2 and control group.

The mean of gingival index in group 2,3,4 were higher compared with group 1,5. It was  $1.97 \pm 0.636$  in group 2,  $1.9 \pm 0.672$  in group 3 and  $1.87 \pm 0.748$  in group 4 while in group 1 it was  $1.27 \pm 0.562$  and in group 5 the mean was  $1.22 \pm 0.588$ .

Inter –group comparison for gingival index between type 1 and type 2 diabetes and between type 2 diabetes and control group were significant while no significant difference between type 1 diabetes and control group.

The comparison of bleeding on probing showed that there was highly significant difference for all groups .

The probing pocket depth showed increase in scale 1, 2, 3 in group 1, 2, 3,4 compared with group 5 while scale 0 increase in group 5 compared to other groups.

The clinical attachment loss showed increase in scale 2, 3, 4 in group 1, 2, 3, 4 compared with group 5 while scale 1 increase in group 5 compared to other groups.

The number and percentage of teeth loss in group 1 was 39(13.6%); 46(16.1%) in group 2 , 66(23.1%) in group 3, 71(24.9%) in group 4 and 63(22.1%) in group 5. There was significant difference for all groups.

There was weak correlation between clinical periodontal parameters and biochemical parameters.

**Conclusion:** Serum C.R.P may be involve in the interaction of periodontitis in type 1 and type 2 diabetic patients. . Highly significant difference in biochemical parameters (HbA1c, C.R.P in saliva and C.R.P in serum) between diabetic groups and control group. Strong correlation between HbA1c&C.R.P in saliva and weak correlation between HbA1c&C.R.P serum.