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study

Benefits of non-surgical periodontal treatment in patients with type-2 diabetes mellitus and chronic periodontitis: a randomised controlled trial

Elisabet Mauri-Obradors, Alexandra Merlos, Albert Estrugo-Devesa, Enric Jané-Salas, José López-López, and Miguel Viñas
J Clin Periodontol. 2017;45 (3): 345-353.

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JCP Digest 03, published by the EFP in November 2018.*

RELEVANT BACKGROUND

Inflammatory periodontal diseases are the most common chronic inflammatory conditions, with up to 90% of the world's population affected. The association of periodontitis with diabetes mellitus has been widely recognised.

Inflammation of the periodontium starts by the formation of a subgingival biofilm, diabetes, and smoking being major risk factors. Patients with well-controlled glycated haemoglobin (HbA1c \leq 7%) have a low risk of periodontitis, however the risk increases exponentially as glycaemic control worsens.

Although the mechanisms linking diabetes and periodontitis are still not fully understood, the roles of inflammation, immune function, neutrophil activity, and cytokines are well established. Conversely, periodontal treatment seems to improve glycaemic control. Nevertheless, more evidence is needed in order to support this association.

AIMS

The aim of the study was to determine whether six months of non-surgical periodontal therapy can lead to a reduction in HbA1c levels in patients with type-2 diabetes and generalised chronic periodontitis.

MATERIALS AND METHODS

Longitudinal research for six months, single-blinded, prospective randomised trial comparing two groups with a total of 90 patients diagnosed with type-2 diabetes and generalised chronic periodontitis. All participants were instructed in oral hygiene.

The control group (CG) was treated by removal of only supra-gingival deposits while the treatment group (TG) was treated by scaling and root planing.

Periodontal examination included plaque index, gingival index, probing depth, and clinical attachment level at baseline and at three and six months. A blood test to determine HbA1c and fasting plasma glucose was performed 30 days before baseline and at the last visit. Bacterial examination was done using paper points and real-time qPCR.

The bivariate analysis was based on independent data according to normality in Student's t-test or an analysis of variance (ANOVA). Pearson or Spearman correlation analysis was used to compare quantitative variables.

results

- At baseline, the two groups had similar mean values for medical parameters, age, sex, medications, duration of diabetes, teeth-brushing frequency, interproximal-brush use, habit variations, weight, and medications, but more patients in the TG were smokers.
- After SRP, an improvement in periodontal parameters was observed in the TG, whereas the changes in response to the control regimen were minimal.
- A comparison of the PI and GI values of the two groups indicated a significant improvement in TG patients at three and six months ($p < .001$) but not in CG patients ($p = .49$). A reduction in PPD (-1.18 and -1.28 mm at three and six months, respectively) was observed in the TG group, while no relevant differences were observed in the CG group.
- A clear reduction in bacterial counts was determined in some but not all patients of the TG group.
- The glycaemic levels decreased significantly in the TG group (18.71 mg/dl, SD 50.35), but increased in the CG group (16.25 mg/dl, SD 54.73) during the six-month period. Glycaemic level changes from baseline to six months differed significantly between the two groups ($p = .02$); also, glycaemic levels of the two groups were significantly different at six months ($p = .02$).
- A sensitivity analysis confirmed the greater improvement in HbA1c levels in TG than in CG patients. The Δ HbA1c values (mmol/mol) were -0.51% and -0.06% , respectively ($p = .02$).



LIMITATIONS

- Statistical analyses failed to find correlation between periodontal parameters and glycaemic control.
- During the six-month period, patients in TG did not receive any prophylaxis, but patients with chronic periodontal disease may need maintenance more often.



CONCLUSIONS

- TG showed improved periodontal status and a significant improvement in the glycaemic levels six month after non-surgical periodontal treatment.
- The periodontal status and metabolic control in the CG remained unchanged.



IMPACT

- Adequate periodontal therapy seems to improve the glycaemic control of patients with type-2 diabetes mellitus and chronic periodontitis.



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