Diabetes Mellitus Type I and it's Relationship With Periodontal Disease: A Systematic Review

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BACKGROUND

The prevalence, severity and progression of periodontal disease (PD) is related to poor glycemic control in type 1 diabetic patients (DM1), however, contradictory results are reported with regard to the influence of PD on metabolic control in patients who depend on insulin. Thus, our goal was to review the scientific evidence that establishes a link between PD and DM1, analysing the possible metabolic influences for the development and worsening of these ailments, as well as possibly identifying courses of intervention that could favour control, or reduce the influence of one disease on the other.

MATERIALS AND METHODS

This review is prepared in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement based on the proposed focused questions. A literature search with no restrictions regarding status or the language of publication was performed for MEDLINE and EMBASE databases up to and including December 2016. Systematic reviews (SRs), randomized clinical trials, and controlled clinical trials, evaluating the influence of DP in DM.

RESULTS

Of the 423 potentially eligible trials, 4 were included and data were assessed.

Figure 1. Study flow diagram.

AUTHOR YEAR	SAMPLE	METHOD / INTERVENTION	OUTCOMES
Llambés et al., 2008.	30 men and 30 women (19-61 years old), DM1 and moderate to severe PD without treatment, no active infection, 14 natural teeth or more, at least 5 teeth with PS ≥ 5mm, NCI ≥ 3mm. 22 patients (HbA1c <7%) good control, 15 subjects (HbA1c between 7% and 8%) moderate control, 23 subjects (HbA1c> 8%) poor control.	Periodontal oral examination (IP, SS, PS, NCI) was performed for all teeth present. G1: instruction on interdental brushing and cleaning techniques, scaling and root planing, prescription of chlorhexidine and doxycycline. G2: same treatment of G1, but without doxycycline.	Periodontal treatment in type 1 diabetic patients after 3 months of follow-up did not improve metabolic control of DM as measured by HbA1c, even in patients with better periodontal response to treatment or in those with the poorer metabolic control of DM at baseline.
Llambés et al., 2012	25 women and 28 men between 19-60 years * DM1 and moderate to severe PD without treatment and antibiotic use (≤ 3 months) * without active infection 14 natural teeth or more; Minimum of 5 teeth with PS ≥ 5mm and NIC ≥3mm * 20 had (HbA1c <7%) good control, * 12 (HbA1c between 7% and 8%) moderate control, * 21 subjects (HbA1c> 8%) poor control. * 47 completed the study, 24 of group 1 and 23 of group 2	G1: 24 patients, PCR indexes measured before the beginning of treatment, instructed on brushing and interdental cleaning techniques, undergoing scaling and root planing under local anesthesia; 0.2% chlorhexidine were prescribed after 2x SRP a day for 12 weeks at the end of the clinical protocol, also being prescribed doxycycline 100 mg (first day) and then one capsule / day for 15 days. G2: 23 patients, same treatment as G1 with the exception of doxycycline .. 12 weeks after treatment, samples were collected again, and the PCR and periodontal parameters were analyzed.	There was an association between advanced PD and high blood CRP rates in patients with DM1, however non-surgical periodontal treatment did not reduce CRP values to a significant level. It may be speculated that PD increases the production of proinflammatory mediators, such as CRP in individuals with DM1, but other sources producing these proinflammatory substances should be identified in these patients. These high levels of CRP may be involved in the Development of DM complications and progression of PD and reduction of these values should be a goal in these patients.
Botero et al., 2013.	105 patients over the age of 18, * DM1 or DM2, having at least 10 teeth present. Randomized in 3 groups (AZ-Sca, PB-Sca; AZ-Pro) to receive non-surgical periodontal therapy accompanied by azithromycin-based antibiotic therapy, placebo and azithromycin, respectively.	G1: Azithromycin 500mg / day for 3 days + subgingival scrapings (AZ-Sca). G2: Placebo 500mg / days for 3 days + subgingival scrap (PB-Sca). G3: Azithromycin 500mg / day for 3 days + supragingival prophylaxis (AZ-Pro) The parameters analyzed were HbA1C, fasting glycemia, PS, NCI, SS and IP.	A modest improvement in glycemic control was detected with a trend toward non-surgical therapy plus azithromycin compared with placebo. However, improving and maintaining periodontal health are important goals in and of themselves, and confirmatory studies in patients with severe generalized PD and DM are still needed.
Ajita et al., 2013.	Patients aged between 18 and 50 years; Carriers of DM1 based on the levels of CRP concentration and metabolic control from the levels of (HbA1C); Diagnosis confirmed more than 3 years ago; Without any type of active infection; Presence of at least 14 natural teeth present and at least 5 teeth with PS ≥ 5 mm and CIN ≥ 3 mm; Without any kind of dental treatment in the last six months prior to the survey.	Oral examination performed through periodontal probing, having as parameters to be analyzed the IP, PS, IS. Measurements were performed on four surfaces of each tooth (mid-vestibular, vestibular, distobuccal and palatine / lingual) and the extent of periodontal disease was expressed as the mean number of sites affected in relation to the total number of sites measured. Periodontal parameters of G1 (20 DM1 individuals) and G2 (20 non-diabetic individuals) were compared.	DM1 patients are more susceptible to DP1, and complications are the same, as the inflammatory process, for example, is higher in individuals with a high course, metabolic lack of control and complications of DM1.

CONCLUSIONS AND CLINICAL IMPLICATIONS

PD is associated with higher levels of uncontrolled glycemic levels in patients with DM1. Periodontal interventions aimed at controlling bacterial and periodontal inflammation may positively influence the control of blood sugar levels and levels of inflammatory protein.