CRD summary
This review concluded that periodontal therapy was beneficial for type 2 diabetic patients with periodontitis (gum disease) and could result in a greater reduction in glycated haemoglobin levels compared with untreated patients. Given limitations with the included trials and the potential for bias in the review process, the authors' conclusions should be interpreted with caution.

Authors' objectives
To compare the effectiveness of periodontal treatment with no periodontal treatment on glycaemic control of diabetic patients.

Searching
MEDLINE and the Cochrane Library were searched between 1960 and March 2009 for English language articles. Search terms were reported. In addition, reference lists of articles were searched manually.

Study selection
Controlled clinical trials (CCTs) and randomised controlled trials (RCTs) of diabetic patients with periodontitis that compared periodontal treatment with no periodontal treatment were eligible for inclusion. Periodontal treatment was defined as tooth scaling and root planing, with or without adjunctive antimicrobial therapy. Eligible trials were required to last at least three months. Outcomes of interest were related to metabolic control.

Trials were conducted in North America, Japan, Thailand and Turkey. All included patients had type 2 diabetes; their mean age ranged from 53 to 67 years. Trials were conducted in diabetic clinics, veteran affairs facilities, a university or hospital. Definitions for periodontal disease and diabetes differed between trials. Control groups received no treatment, oral hygiene instruction or regular dental care. Trial duration ranged from three to 18 months. Outcomes (parameters of metabolic control) included glycated haemoglobin ($A_1C$) levels, fasting plasma glucose, high sensitivity C-reactive protein, and two-hour postprandial glucose levels.

The authors did not state how many reviewers performed the study selection.

Assessment of study quality
Included trials were assessed for quality according to the Dutch Cochrane Centre and the Dutch Institute for Healthcare Improvement CBO, including criteria on randomisation, allocation concealment, blinding and loss to follow-up. Trials were graded as good or doubtful quality.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Means and standard deviations (SDs) for each outcome were extracted to calculate mean differences and their 95% confidence intervals (CIs). Where data were missing, authors of the primary studies were contacted for further information.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
A random-effects model was used to calculate weighted mean differences (WMDs) and their 95% confidence intervals.
Statistical heterogeneity was assessed using the $I^2$ statistic.

**Results of the review**

Five trials (three RCTs and two CCTs) were included in the review (n=382 patients). Sample sizes ranged from 44 to 165 patients. The three RCTs were deemed to be of good quality, while the two CCTs were of doubtful quality.

There was a statistically significant improvement (i.e. a decrease) in glycated haemoglobin levels after periodontal treatment compared with patients in untreated control groups (WMD -0.40%, 95% CI -0.04 to -0.77%; five trials). However, there was evidence of statistical heterogeneity ($I^2=59.5\%$).

There were no statistically significant differences in fasting plasma glucose between the intervention and control groups (WMD 2.30mg/dL, 95% CI -13.64 to 18.34; three trials). There was no evidence of statistical heterogeneity ($I^2=23.7\%$).

For other parameters of glycaemic control after periodontal treatment, one trial reported on high sensitivity C-reactive protein and one trial reported on two-hour postprandial glucose levels. Details were reported in the review.

**Authors’ conclusions**

Periodontal therapy was beneficial for type 2 diabetic patients with periodontitis and could result in a greater reduction in glycated haemoglobin levels compared with control groups, but more evidence is required.

**CRD commentary**

The review question and inclusion criteria were clear. The literature search was adequate and there were no language restrictions. There did not appear to have been any attempt to locate unpublished criteria and publication bias was not formally assessed, so potentially relevant papers may have been missed. The authors did not state how the review process was undertaken (i.e. whether each stage of the process was undertaken in duplicate), so reviewer error and bias may have been introduced.

Trial quality was assessed using previously published criteria, although the grading process was somewhat unclear and only three trials were deemed to be of good quality. The statistical methods used to pool the data appeared to be appropriate, although there was some evidence of statistical heterogeneity, which was not explored further. The authors acknowledged certain weaknesses with the analyses, including wide confidence intervals, heterogeneity among the included trials, the small number of trials and the small sample sizes within trials.

Given limitations with the included trials and the unclear review methods, the authors’ conclusions should be interpreted with caution.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated that further large, single-blind RCTs of diabetic patients with moderate or severe periodontitis are needed. Further trials should compare basic periodontal treatment (oral hygiene instruction and tooth scaling and root planing) with no periodontal treatment for six months or more, to assess the change in the following: (plasma) markers of glycaemic control; (plasma) markers of systemic inflammation; and the amount of periodontal inflammation.

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**Bibliographic details**

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.