Effect of periodontal disease treatment during pregnancy on preterm birth incidence: a metaanalysis of randomized trials

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CRD summary
This review provided evidence that treatment of periodontal disease in pregnant women reduced incidence of preterm birth and low birth weight. The conclusions seem reliable at the time of writing. But, the results of three large randomised controlled trials that were underway may help answer this clinical question.

Authors’ objectives
To evaluate the effect of the treatment of periodontal disease during pregnancy in reducing the incidence of preterm birth/low birth weight in infants or rate of abortions/stillbirths.

Searching
The Cochrane Central Register of Controlled Trials (CENTRAL), Web of Science and MEDLINE were searched up to January 2008 without language restrictions. Search terms were reported. References of eligible trials were reviewed, first authors' names were cross-searched in MEDLINE and the five previous years of three relevant journals were handsearched for potentially eligible trials.

Study selection
Randomised controlled trials (RCTs) were considered for inclusion. Studies that compared periodontal treatment (scaling and/or root planing) versus no treatment or prophylaxis in pregnant women with documented periodontal disease (regardless of depth and severity) were eligible. It appeared that there were no restrictions in age of the included patients or duration of periodontal treatment. Preterm birth, low birth weight and data on abortion/stillbirth were eligible outcomes for inclusion.

Selected studies showed a wide variation in the percentage of patients with previous preterm birth/low birth weight and education level. Most patients had mild-moderate periodontal disease.

Two reviewers independently evaluated the studies for inclusion. Disagreements were solved by consensus with a third reviewer.

Assessment of study quality
It appeared that two reviewers independently registered data for each selected trial on: method of randomisation; allocation concealment; blinding; and withdrawals per arm.

Data extraction
Numbers of birth-related outcomes were extracted for each treatment arm and used to derive odds ratios (ORs) and 95% confidence intervals (CI).

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Methods of synthesis
Pooled odds ratios and corresponding 95% CI were calculated using a Mantel-Haenszel method meta-analysis where there was no evidence of statistical heterogeneity. A Der Simonian and Laird random-effects model was used if statistically significant heterogeneity was observed. Heterogeneity was assessed using the $\chi^2$ test with a level of significance of 0.1.

Subgroup analyses for previous history of preterm birth/low birth weight, low level of education and severity of the
periodontal disease were performed to study possible sources of clinical heterogeneity.

Results of the review
Seven RCTs (n=2,663) were included in the review. Three trials reported an adequate randomisation method, two reported allocation concealment and three were blind.

Preterm birth: All studies reported this outcome. There was a statistically significant reduction in incidence of preterm birth in women who received periodontal treatment compared to those who did not (OR 0.55, 95% CI 0.35 to 0.86, p<0.05). There was evidence of statistically significant heterogeneity (p=0.059).

Low birth weight: Five studies reported this outcome. There was a statistically significant reduction in incidence of low birth weight in women who received periodontal treatment compared to untreated women (OR 0.48, 95% CI 0.23 to 1.00, p<0.05). Statistically significant heterogeneity was observed for this outcome (p=0.051).

Spontaneous abortions/stillbirths: Six studies reported this outcome. Two studies reported no events in both arms. There was no statistically significant difference in this outcome. Statistically significant heterogeneity was not observed.

Subgroup analyses: Less than 10% incidence of a previous history of preterm birth/low birth weight and less severe periodontal disease were associated with a statistically significant benefit of treatment.

Authors' conclusions
The review findings suggested that treatment of periodontal disease during pregnancy reduced the rate of preterm birth and may reduce the incidence of low birth weight in infants.

CRD commentary
This review addressed a well-defined question in terms of participants, outcomes and study design. Inclusion and exclusion criteria were specified. The search included relevant databases, although the authors apparently did not search for unpublished data, which meant that relevant studies may have been missed. It appeared that steps were taken to minimise reviewer bias/errors by selecting studies and extracting data in duplicate. Validity was assessed in a descriptive way, but the results were not used in the analysis. Publication bias was not assessed. Characteristics of included studies were presented clearly. Methods used to pool the results were appropriate and potential sources of heterogeneity were explored. However, severity of the periodontal disease differed greatly among studies. The conclusions reflected the evidence presented and seem reliable. However, three major studies were under way at the time of the review and the review will need to be updated when the results are available; the authors acknowledged this and other limitations of this generally well-conducted review.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors did not state any implications for research; three large RCTs underway at the time of the review should help clarify the issue.

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