

PERIODONTAL DISEASE AS A RISK FACTOR FOR ADVERSE PREGNANCY OUTCOMES: SUMMARY OF A SYSTEMATIC REVIEW

Original Article: Scannapieco FA, Bush RB, Paju S. Periodontal disease as a risk factor for adverse pregnancy outcomes. A systematic review. *Ann Periodontol* 2003; 8(1): 70-76.

Premature delivery and low birth weight are closely associated with infant morbidity, mortality, and long-term health complications. In recent years, researchers have suggested that maternal bacterial infections, such as those caused by periodontal diseases, may be potential risk factors for preterm birth (delivery before 37 weeks of gestation) and low birth weight infants (weighing less than 5.5 pounds at full term).

To investigate this further, Scannapieco and colleagues conducted a systematic review to evaluate the evidence linking maternal periodontal disease to preterm, low birth weight (PLBW) infants, and to determine if periodontal therapy reduces the risk for adverse pregnancy outcomes. The reviewers identified 12 studies that evaluated whether women with periodontal disease are at increased risk for adverse pregnancy outcomes, but only three of the studies analyzed whether treatment of periodontitis had an effect on preterm delivery and low birth weight. In addition, only one of the three intervention studies was a randomized controlled trial. Another study identified by the reviewers found no association between maternal periodontal disease and the delivery of preterm, low birth weight infants.

Scannapieco and colleagues found moderate evidence to support an association between periodontal disease and adverse pregnancy outcomes, but no definitive evidence that the relationship is causal or that periodontal treatment reduces risk. As noted by the authors, further randomized controlled clinical trials are necessary to evaluate the effects of periodontal intervention in reducing adverse pregnancy outcomes.

Since October 2002 (the cutoff point for Scannapieco and colleagues' literature search), the evidence linking periodontal disease as a risk factor for adverse pregnancy outcomes has continued to grow in scope, although not all studies have universally supported the association. Multiple studies are currently underway to determine if periodontal treatment can reduce the incidence of preterm birth.

Based on the evidence available to date, dentists should continue to promote the importance of good oral health and provide appropriate treatment to all patients with periodontal disease including pregnant women. There is not evidence at this time to suggest that a specific oral health treatment during pregnancy will have a positive effect on infant morbidity, mortality or long-term health complications.

SUMMARY OF THE EVIDENCE ON PERIODONTAL DISEASE AS A RISK FACTOR FOR ADVERSE PREGNANCY OUTCOMES

What clinical question did this systematic review address?

Does prevention/treatment of periodontal disease have an effect on pregnancy outcomes?

What were the authors' objectives?

To identify all pertinent literature on the association of periodontal disease with preterm delivery and low birth weight, to understand the current evidence (through October 2002) on this subject, and to recommend future research directions.

What timeframe did the review cover?

Searches of computerized databases (and references lists of published review papers) through October 2002, including MEDLINE (1966 through October 2002), pre-MEDLINE (for pre-1966 citations; now known as OLDMEDLINE), MEDLINE Daily Update, and the Cochrane Oral Controlled Trials Register.

Which populations were examined by the reviewers?

Mothers with periodontal disease--as diagnosed by assessments of gingival inflammation, probing depth, clinical attachment level, radiographic bone loss, elevated oral cytokine levels, elevated periodontopathogen levels in plaque, and/or elevated maternal serum IgG levels against periodontopathogens--who gave birth to preterm and/or mature infants.

Which interventions were reviewed?

All forms of periodontal therapy, including plaque control instructions, scaling and root planing, and once-a-day oral rinsing.

Which comparison—if any--was reviewed?

Controls. The definition of a "control" is not specified, and the control groups varied among the studies included in this review (e.g., normal birth weight infants or non-treatment groups of pregnant women with periodontal disease).

What outcomes were included in the review? Four outcomes were addressed:

1. Primary outcome: rate of prematurity (gestational age < 37 weeks) and/or low birth weight for gestational age.
2. Secondary outcome: rate of complications associated with prematurity.
3. Patient-centered outcome: maternal health.
4. Intraoral adverse effects: rate of prematurity and/or low birth weight.

What study designs were included in the review?

Randomized controlled clinical trials; longitudinal, case-control, and cohort studies (for definitions of these study designs, visit the glossary of the Association's EBD policy at <http://www.ada.org/prof/resources/positions/statements/evidencebased.asp#glossary>).

How many studies were included in the review (in relation to the number of identified studies)?

Twelve studies met the selection criteria: six case-control studies, three longitudinal or cross-sectional studies, and three intervention studies (note: 663 publications were identified by the reported search strategy). Due to study heterogeneity (e.g., variable definitions of “periodontal disease” and “adverse pregnancy outcome”), meta-analysis was not possible (note: a definition of “meta-analysis” is provided in the glossary of the Association’s EBD policy at <http://www.ada.org/prof/resources/positions/statements/evidencebased.asp#glossary>).

What were the results of the review?

1. While several studies implicated periodontal disease as a risk factor for preterm/low birth weight, few assessed the impact of the prevention and treatment of periodontal disease on outcomes.
2. Several epidemiologic studies did not support periodontal disease as a risk factor for preterm/low birth weight babies.

What were the authors’ conclusions?

1. Periodontal disease may be a risk factor for preterm/low birth weight.
2. Additional longitudinal, epidemiologic and interventional studies are needed to validate this association and to determine whether it is causal.
3. It is not yet clear whether periodontal diseases play a causal role in adverse pregnancy outcomes.
4. Preliminary evidence to date suggests that periodontal intervention may reduce adverse pregnancy outcomes.

What are the practice implications of the review cited by the authors?

The authors did not present practice implications, given the limited number of randomized controlled clinical trials focusing on periodontal intervention.

What are the research implications of the review cited by the authors?

1. Additional longitudinal epidemiologic and interventional studies are necessary to validate the association between periodontal disease and preterm/low birth weight babies and to determine if the association is causal.
2. Studies should include subjects from diverse racial, socioeconomic and cultural backgrounds.
3. Randomized controlled clinical trials are needed to evaluate the effects of periodontal intervention in the prevention of adverse pregnancy outcomes.

Link to abstract of the Scannapieco et al. systematic review

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14971249&query_hl=1

Other systematic reviews on this topic

Madianos PN, Bobetsis GA, Kinane DR. Is periodontitis associated with an increased risk of coronary heart disease and preterm and/or low birth weight births? *J Clin Periodontol* 2002; 29 Suppl 3: 22-36.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12787204&query_hl=1

Related studies since completion of the Scannapieco et al. review

Jeffcoat MK, Hauth JC, Geurs NC, Reddy MS, Cliver SP, Hodgkins PM, Goldenberg RL. Periodontal disease and preterm birth: results of a pilot intervention study. *J Periodontol* 2003 Aug;74(8):1214-8.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14514236&query_hl=4

Jarjoura K, Devine PC, Perez-Delboy A, Herrera-Abreu M, D'Alton M, Papapanou PN. Markers of periodontal infection and preterm birth. *Am J Obstet Gynecol* 2005 Feb;192(2):513-9.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=15695995&query_hl=13

Goepfert AR, Jeffcoat MK, Andrews WW, Faye-Petersen O, Cliver SP, Goldenberg RL, Hauth JC. Periodontal disease and upper genital tract inflammation in early spontaneous preterm birth. *Obstet Gynecol* 2004 Oct;104(4):777-83.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=15458901&query_hl=12

Lieff S, Boggess KA, Murtha AP, Jared H, Madianos PN, Moss K, Beck J, Offenbacher S. The oral conditions and pregnancy study: periodontal status of a cohort of pregnant women. *J Periodontol*. 2004 Jan;75(1):116-26.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=15025223&query_hl=15