Scaling and Root Planing Is Effective in Reducing Preterm Birth Only in High-Risk Groups

**Selection Criteria**
RCTs done in pregnant women who had periodontal disease (probing depth ≥4 mm or clinical attachment loss ≥2 mm in at least one site) where the intervention was SRP and at least one outcome was preterm birth (PTB ≤ 37 weeks) were selected for the analysis. Studies were located by searching MEDLINE (1950-September, 2011), CINAHL (1980-September, 2011), and EBSCO (1990-September 2011). Search was not limited to English language articles. Eleven foreign language studies were later eliminated, as they did not meet inclusion criteria. Hand searches were used to supplement the original search, and both obstetrics and periodontology experts were also contacted. Additional attempts were made to locate unpublished studies by searching ClinicalTrial.gov and by reviewing abstracts and specific conference proceedings. Twelve studies were included in the final analysis.

**Key Study Factor**
Common intervention was SRP performed on pregnant women. Control groups were not treated for periodontal disease before delivery. Both groups could receive routine dental treatment and oral hygiene instructions. Primary outcome was PTB. Study subjects were on average between 22.8 and 30.5 years of age. Timing of the intervention (SRP) was, however, highly variable (from 6 to 35 weeks of gestation).

**Main Outcome Measure**
PTB was the main outcome measure. This was defined as a delivery before 37 weeks of pregnancy.

**Main Results**
Sixty-five studies were assessed for eligibility using full text review, and 53 of those were excluded because they failed to meet eligibility criteria. Based on the 12 RCTs included in the study, authors observed a statistically significant reduction in preterm birth as a result of SRP, but only in the high-risk women (pooled risk ratio [RR] = 0.66; 95% confidence interval [CI] = 0.54-0.80). The high-risk group of studies showed a statistically significant reduction in low birth weight incidence as well (RR = 0.48; 95% CI = 0.30-0.78). High risk was defined as having a higher incidence of PTB (>22%) based on the combined PTB incidence in treatment and control groups within each study. Only four studies were included in this analysis, with 88/280 events in the treatment group and 130/275 events in the control group. When all the studies were combined, reduction in PTB was not statistically significant (RR = 0.81; 95% CI = 0.64-1.02). Results were similar for >35 week deliveries, low birth weight incidence, and mean low birth weight.
Conclusions
Authors concluded that for the general population, there is insufficient evidence to support the need for periodontal disease treatment to reduce preterm birth but periodontal treatment may be beneficial for populations in which the incidence of preterm birth is high.

COMMENTARY AND ANALYSIS
This systematic review and the meta-analysis add to the previous similar attempts by incorporating more studies and performing post-hoc sub-group analyses that were not done previously. Polyzos et al, showed that periodontal treatment and reduction of PTB association was only significant when the meta-analysis was restricted to high-quality studies. The current study does an extensive job of eliminating potential biases by conducting numerous sensitivity analyses and concludes that the association in question is only statistically significant when the study subjects had a higher incidence of PTB. Although this analysis is thorough, it is only as good as the original studies because ‘you cannot make a silk purse out of a sow’s ear.’ If one were to find the ‘truth’ about the efficacy of periodontal treatment in reducing PTB, one must consider a number of issues. These issues and how they apply to this situation are outlined below.

1. A standard and unified definition for periodontal disease should be used by all studies. As shown in Table 1 of the article, there is a high degree of variability in the periodontal disease definition used in each study.

2. Treatment should also be standardized and given during a biologically meaningful timeframe in adequate ‘doses.’ SRP was given at different gestational periods, by different individuals, and in different frequencies. This treatment variation makes drawing valid inferences harder.

3. Treatment should be shown to be effective against periodontal disease because it is the inflammation and infection that is associated with periodontal disease that might threaten the feto-placental unit. Only a few studies have shown the effectiveness in SRP in actually reducing the underlying periodontal disease during pregnancy in the studies included in this analysis. It is naive to assume that scraping teeth once or twice during pregnancy will get rid of this chronic disease. If the underlying condition or remnants of it remain after SRP, it is unrealistic to expect SRP to reduce PTB.

4. Outcome measures should be based on unified criteria. Gestational age is not always based on sonograms, and some studies may have used the last menstrual period in addition to sonograms to measure gestational age. If the potential error related to this measure is random or non-differential (i.e., equal amounts in treatment and control groups), the risk ratios will be biased toward the null value (i.e., investigators will underestimate the true effect). In addition, PTB and low birth weight may not be the only outcomes that might be related to periodontal disease. Spontaneous abortion, still birth, and neonatal complications can also be related, at least in theory, to the infection and inflammation associated with periodontal disease. There was some evidence for that in Michalowicz et al study.

5. Subject selection criteria also should be unified. If we include high-risk as well as low-risk subjects, it will be difficult to evaluate the true effect as shown in this analysis. These investigators appropriately separated studies done in high-risk groups from the rest. However, this categorization is not based on population data, but on the combined incidence of PTB in treatment and control group subjects. This approach to categorization on risk for the adverse outcome may also bias the risk ratios either toward or away from the true value.

6. Concomitant medication and other dental treatment during the trial may influence the outcomes. It is unclear how the variability in antibiotic use for other purposes, additional dental treatment outside of the trial, and even the variability in personal hygiene practices during the trial influence the outcomes.

7. Is SRP the preferred treatment? Some studies have shown a statistically significant reduction in PTB and low birth weight when high-risk women were asked to rinse their mouth twice daily with a medicated mouthwash.

8. Is this as per protocol or intent-to-treat analysis? As shown in Table 1, attrition rates were differentially distributed within and among studies. If randomized, data for those subjects should be analyzed on an intent-to-treat basis to maintain the integrity of the randomization. It is unclear how the differential attrition rates influenced the results of this study.

If there are enough studies in the literature, it is not difficult to perform additional sub-group analyses to take into account the variations in at least some of the factors mentioned and to see the effect of those factors on the outcome. Unfortunately, we only have a handful of RCTs in this area.

Ideally, if we are to find the truth about the efficacy of periodontal treatment in reducing poor pregnancy and neonatal outcomes, perhaps we should conceptually provide the most efficacious and the safest modes of periodontal treatment (either singly or in combination) to a carefully selected group of high- and low-risk pregnant women in sufficient numbers. These women should then be carefully followed to gather valid information on concomitant medication and other treatment they may receive during the trial (after the randomization) that might be related to the outcomes.

Finally, readers should not misinterpret the results of this study as indicating that good oral health is
unimportant. Because the mother’s oral health is significantly related to several downstream events in the baby, such as mutans streptococci transmission and tooth decay, it is important to maintain proper oral health before, during, and after pregnancy regardless of whether it may or may not reduce PTB.

REFERENCES


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