



Is Periodontal Disease in Pregnancy Associated with Adverse Pregnancy Outcomes?



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Introduction

Pregnancy marks an important milestone in the life-course of a woman compounded by the dual phenomena of pregnancy affecting oral health status of a woman and oral health status affecting pregnancy outcomes. Pregnancy makes a woman more vulnerable to common oral diseases such as dental caries and periodontal disease if oral health status is not well maintained during this crucial period. Changes in dietary habits and difficulties in maintaining oral hygiene could increase the risk of tooth decay in pregnancy. Moreover the increased production of oestrogen and progesterone during pregnancy may give rise to development of gingivitis and periodontitis attributed to increased vascular permeability and tissue oedema [1]. Against such a scenario, studies conducted among pregnant women have reported that they carry a high burden of dental caries and periodontal disease [2].

Evidence suggests that maternal periodontal disease is associated with gestational diabetes mellitus (GDM) contributing to infant and maternal morbidity as well as the elevated risk of mother for developing diabetes mellitus subsequently [3]. Furthermore, maternal periodontal disease may elevate the risk for adverse pregnancy outcomes such as pre-eclampsia, pre-term birth, retarded fetal growth and low birth weight [4]. There are plausible mechanisms suggested for such associations as chronic periodontal disease acting as reservoirs for Gram-negative anaerobic bacteria, their toxins and inflammatory mediators such as PGE₂, TNF- α , C reactive proteins (CRP) thus posing potential threats to the foetal-placental unit. Sustained elevated levels of CRP and interleukins act as insulin antagonists interfering with insulin signaling thus causing glucose intolerance and GDM. A recent systematic review and meta-analysis reported that periodontitis was associated with a significantly high risk of GDM compared to women without periodontitis [3]. Nevertheless, the association between periodontal disease status in pregnancy and adverse pregnancy outcomes has been challenged by some research which attempted to provide oral health care during pregnancy and then follow the pregnancy outcome. For example,

some studies failed to show an association between periodontal care in pregnancy and pregnancy outcomes conducted in Western Countries [5]. There could be several explanations such as the periodontal disease risk profiles of western pregnant women could be different from Asian women [6] as smoking is more common among Western women. Periodontal disease increases the risk for pre-term birth but treatment for this condition may not reduce the risk because causation and treatment efficacy could be interrelated or they could function independently. The classic example to support this notion is bacterial vaginosis, which is considered to be a contributory factor among other factors for pre-term births, yet antibiotic treatment for bacterial vaginosis has not reduced the risk for pre-term births in controlled clinical trials [7].

Nevertheless, by all means optimal oral health care coupled with oral health education in pregnancy is an essential component in the package of ante-natal care. It ensures controlling aggravation of existing tooth decay and gum disease in pregnancy, prevent complications of existing dental disease, may contribute to prevention of adverse pregnancy outcomes and most importantly provides an opportune time to make the mother-to-be for taking care of her baby's oral health. Early Childhood Dental Caries (ECC) is one of the most common chronic infectious childhood disease affecting children both in developing and developed countries [8]. Hence, making the mother well-versed in controlling this condition and to get her decayed teeth filled thereby controlling transmission of decay producing bacteria to the baby becomes crucial in addressing the global public health challenge of ECC [9].

Last but not least, recent publications highlighted that when profiling the placental microbial communities, the major phylum was Proteobacteria and the oral cavity was the most comparable site more than all other organs with regard to bacterial communities including *Prevotellatannaerae* and *Neisseria* [10]. The implication of this finding is that bacteria may transmit from oral cavity to the placenta thus providing another plausible

explanation for the association between maternal periodontitis and adverse pregnancy outcomes [11]. Further studies with rigorous methodologies with high throughput sequencing and bioinformatics warranted in this regard to apply meta-genomic evidence to public health programmes on oral health care to pregnant mothers.

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