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Mini Review

Periodontitis: Potential Side Effects in Pregnancy

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Clinical studies during pregnancy have reported an increase in the prevalence and severity of gingival inflammation [1,2], which disappears postpartum with no permanent effects on periodontal attachment.

The prevalence of pregnancy gingivitis could reach 100% [2]. The correlation between changes in hormone levels during pregnancy and the increase in gingival inflammation still not fully clear with the precise mechanism responsible for these gingival changes is still not fully understood. Various hypotheses, however, have been proposed including depression of the immune system, increased vascularity and vascular flow, cellular changes and changes in oral among many other. Therefore, pregnancy gingivitis was considered to be an exacerbated inflammatory response that results from a host–parasite imbalance.

On the other hand, It is widely recognized nowadays that periodontitis is an infectious disease associated with a small number of predominantly gram-negative microorganisms. In most cases, those pathogenic bacteria are not in and of themselves sufficient to cause such a multi-layer destructive disease. A susceptible host is also imperative and due to differences in host susceptibility and wound healing capacity, not all individuals, therefore, are equally vulnerable to the destructive effect of periodontal pathogeneses.

During pregnancy, sex hormones levels may rise dramatically. Progesterone could reach levels of 100 ng/ ml, 10 times the peak luteal of menses. Estradiol in the plasma may reach 30 times higher levels than during the reproductive cycle. In early pregnancy and during the normal ovarian cycle, the corpus luteum is the major source of Estrogen and Progesterone while later-on during pregnancy, the placenta begins to produce Estrogens and Progesterone.

Estrogen is thought to regulate cellular proliferation (increase cellular proliferation in blood vessels), differentiation and keratinization (decrease keratinization and increase epithelial glycogen), whereas Progesterone influences the permeability of the microvasculature (increase vascular dilation, and increase newly formed capillaries in the gingival tissues thus increase their bleeding tendency), alters the rate and pattern of collagen production, and increase the metabolic breakdown of folate (which is necessary for tissue maintenance and repair). High levels and concentrations of sex hormones in the gingival tissues, gingival crevicular fluid, saliva, serum may also aggravate and exaggerate the response.

Although the potential impact of many systemic disorders on the periodontium is well-documented, recent evidence suggests that periodontal infection may significantly enhance the risk for certain systemic diseases or alter the nature course of systemic conditions such as in coronary heart disease (CHD), angina, stroke, infarction, atherosclerosis, diabetes mellitus, respiratory conditions such as chronic obstructive pulmonary disease (COPD), pregnancy related conditions such as preterm labour, low birth-weight and many others.

Low-birth-weight (LBW) infants (Less than 2500g at birth) are known to be 40 times more likely to die in the neonatal period than normal-birth-weight (NBW) infants. Although only about 7% of all infant's weight less than 2500g at birth die, they account for two thirds of neonatal deaths. LBW infants who survive the neonatal period are known to be at increased risk for respiratory disorders and neuro-developmental disabilities. The social and financial costs of LBW infants are enormous, and an emphasis on prevention of LWB is preferred to the high-cost intensive care often required to allow survival of LBW infants.

The primary cause of LBW infant deliveries is preterm labor or premature rupture of membranes. Factors such as smoking, alcohol or drug use during pregnancy, inadequate prenatal care, race, low socioeconomic status, hypertension, high or low maternal age, diabetes and genitourinary tract infections among others increase the risk of preterm LBW. However, these risk factors are not present in approximately one fourth of preterm LBW cases, leading to a continued search for other causes.

Research has tried to examine the relationship between maternal infection and preterm labor, premature rupture of membranes, and LBW delivery. The true extent of this relationship is difficult to determine, since the majority of maternal infections may be subclinical.

Due to the pioneering research by Offenbacher [3], evidence exists that untreated periodontal disease in pregnant women maybe a significant risk factor for preterm (< 37 weeks' gestation) and low-birth-weight (< 2500g) babies. The relationship between genitourinary tract infection and preterm, low-birth-weight (PLBW) babies is well documented in human and animal studies. Periodontal researchers, strongly suspecting periodontal disease as another source of infection, found that otherwise low-risk mothers of PLBW infants had significantly more periodontal attachment loss than other control mothers having normal-weight infants at birth.

Women who had LBW infants were found to have significantly higher levels of *Actinobacillus actinomycetemcomitans, Bacteroides forsythus, P. gingivalis* and *Treponema denticola* in their subgingival plaque than did the control group women who had normal birth weight infants (NBW). IL-1 and PGE2 levels were found to be much higher in their gingival crevicular fluids, and those women were found to have more attachment loss, higher prevalence and severity of periodontitis, more gingival bleeding and inflammation, higher levels of putative periodontal pathogens, and elevated subgingival inflammatory response.

Because pregnancy places the woman in a kind of an immune-compromised state, the clinician must be aware of the total health of the patient. Gestational diabetes, gestational thrombocytopenia and other medical conditions that may appear during pregnancy.

It is therefore, recommended that strict oral hygiene measures should be followed all the times but mainly in pregnancy and very close monitoring to gingival and periodontal health in pregnancy should be a mutual responsibility of the pregnant woman, her dentist and other physicians involved in order to minimize if not avoid the potential short and long-term side effects not only on the mother but on the future baby as well [4].

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