

Relationship between pregnancy and periodontal disease

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Abstract

In this report, we will discuss the relationship between the periodontal disease and pregnancy, which is bidirectional which means both have an effect on each other. The changing of hormonal pregnancy can cause pyogenic granuloma. And the periodontal diseases' bacteria can cause systemic effects which lead to pregnancy outcomes which have many presentations. The periodontal treatment can cause an effect in pregnancy.

Introduction

During the course of a normal pregnancy, a series of profound and dynamic physiological changes occur in both the mother and developing the baby. Some of the pregnancy-induced immunological modifications in the mother increase her susceptibility to a number of infections, including periodontal disease. It also appears that periodontal infections are a group of infection and conditions that cause inflammation gingiva and surrounding structure, which lead to the destruction of supporting tooth structures. Periodontal infections are predominantly caused by gram-negative bacteria that induce local and systemic elevation of proinflammatory cytokines. It causes an increase in the risk of adverse pregnancy outcomes. Such outcomes include pre-term birth, preeclampsia, gestational diabetes, delivery of a small for gestational-age infant, and fetal loss. Also, the using of periodontal therapy can affect in the pregnancy ⁽²⁾.

Pregnancy Outcomes Influenced by Periodontitis

The placenta is a very good line of defense to protect a human fetus from the elements. But it is known for some time that it isn't an impenetrable barrier. For a long time, we have known that risk factors such as smoking, alcohol use, and drug use may contribute to produce an alteration, disruption or teratogenic consequence. there is a new risk factor which is periodontal disease. Systemic inflammation and its chemical mediators play a major role in the pathogenesis of preterm delivery, including pre-eclampsia, intrauterine growth restriction, and preterm delivery, a chronic infection like intrauterine infection and chorioamnionitis are linked to both periodontal disease has been ,preterm birth and elevated CRP levels. Furthermore associated with increased risk of preterm low birth weight, low birth weight, and preterm birth. Pregnant women who have moderate to severe periodontal disease may be seven times more likely to deliver a premature child, then women with healthy periodontium. periodontal disease may be responsible for up to 18 percent of preterm births. Periodontal diseases may be as detrimental to pregnancy as smoking or alcohol abuse. The periodontal disease triggers increased levels of biological fluids that induce labor. It increases in the levels of prostaglandin and tumor necrosis factor molecules that induce labor. The immune system relaxes slightly during pregnancy so as not to harm the fetus. that lead to bacteria grow about 10000 times the original population. Preterm birth with its subsequent morbidity and mortality is the leading

perinatal problem. Infants born before the thirty seventh week of gestation account for approximately 6% to 9% of all births. Maternal periodontal disease at antepartum and incidence/progression of periodontal disease are significantly associated with a higher prevalence rate of preterm births, low birth weight that about smaller than 2,500g, and low weight for gestational age. The potential role of maternal infection with specific organisms within 2 bacterial complexes most often associated with periodontitis conventionally termed "Orange" (*Campylobacter rectus*, *Fusobacterium nucleatum*, *Prevotella nigrescens*, and *Prevotella intermedia*) and "Red" (*Porphyromonas gingivalis*, *Bacteroides forsythus*, and *Treponema denticola*) complexes of prematurity, was investigated by relating the presence of oral infection, maternal IgG, and fetal cord IgM, comparing full-term to preterm. There was a 2.9-fold higher prevalence of IgM seropositivity for one or more organisms of the Orange or Red complex among preterm babies, as compared to term babies. A lack of maternal IgG antibody to organisms of the red complex was associated with an increased rate of prematurity. That means maternal periodontal infection in the absence of a protective maternal antibody response is associated with systemic dissemination of oral organisms that translocate to the fetus resulting in prematurity⁽¹⁾.

Pregnancy and increased susceptibility to gingival pyogenic granulomas

Female steroid hormones may have dual effects on the pathogenesis of pyogenic granuloma in pregnancy. The hormones not only enhance the expression of angiogenic factors in inflamed tissue but also decrease apoptosis of granuloma cells to extend the angiogenic effect. The pyogenic granuloma is a common tumor-like growth of the oral cavity considered to be non-neoplastic in nature. It occurs in both males and females. However, it occurs most often during pregnancy, with gingival lesions. The gingival lesions that are found in association with pregnancy are sometimes called pregnancy tumors or granuloma gravidarum. Clinically, the lesion is a raised, red, peripheral growth sessile or pedunculated, usually originating from a minor trauma. Its healing response is exaggerated in proportion to the degree of injury, which results in a localized overgrowth of granulation tissue. The tissue overgrowth varies from small growths of only a few millimeters in size to larger lesions that may measure 2 to 3 centimeters in diameter. Surface ulcerations are usually present in areas where the tumor is subjected to trauma. Typically, the mass is painless although it often bleeds easily due to its extreme vascularity. Treatment may include surgical removal, especially if the lesion is large and symptomatic. However, in many cases, the lesions undergo partial or complete resolution after delivery, especially if local irritants are removed. Occasionally they may lead to serious clinical complications. For example, severe and uncontrollable bleeding over a period from a gingival pyogenic granuloma resulted in the decision to induce labor at very early gestation. Because of acute fetal distress during induction, a cesarean section was performed to deliver a healthy infant. Gingival bleeding stopped spontaneously after delivery. Finally, some life-threatening malignant gingival lesions such as angiosarcoma and hepatocellular carcinoma have been misdiagnosed as pyogenic granulomas⁽²⁾.

Effects of Periodontal Therapy During Pregnancy

The effects of second-trimester scaling and root planning and the use of a sonic toothbrush on the rate of preterm delivery. The periodontal intervention resulted in a significantly decreased incidence of preterm delivery. Pregnancy without periodontal treatment was associated with significant increases in probing depths, plaque scores, GCF IL-1 β and GCF IL-6 levels. The intervention resulted in significant improvements in clinical status (attachment level, probing depth, plaque, gingivitis, and bleeding on probing scores) and significant decreases in levels of *Prevotella nigrescens* and *Prevotella intermedia*, serum IL-6sr, and GCF IL-1 β . The rate of preterm delivery might be significantly reduced with periodontal therapy about a 3.8-fold. the rate of delivery of births of GA <35 weeks was 0.81% among mothers with periodontal disease receiving scaling and root planning compared to 4.9% among mothers in the periodontally diseased group receiving a prophylaxis. The untreated cohort of mothers with a similar periodontal disease, the incidence of births of GA <35 weeks was 6.3%, suggesting that SRP, and perhaps even prophylaxis, may have beneficial effects. Maternal periodontal therapy during pregnancy would be biologically safe to the mother and the fetus and would diminish the level of oral infection and the host inflammatory response that may, in turn, result in a reduction of preterm birth rates. daily oral hygiene home care using a sonic toothbrush would reduce the incidence of adverse pregnancy outcomes and improve periodontal disease status. As hypothesis generating analyses, by measuring the effects of therapy on the levels of oral inflammatory mediators, the levels of bacterial pathogens within the plaque, and the serum inflammatory response. They examined to ensure the safety of periodontal therapy during pregnancy and to measure whether prepartum periodontal treatment presented any adverse infectious or inflammatory systemic challenges to the mother or fetus ⁽¹⁾.

Conclusion :

The pregnancy can be affected by many factors including the periodontal disease. the periodontal disease puts the pregnancy at high risk. It causes a Systemic inflammation which leads to preterm delivery, including pre - eclampsia, low birth weight, low birth weight and others. however, the pregnancy causes an effect in disturbance of female hormonal which cause pyogenic granulomas, that means even though the periodontal disease affect the pregnancy, the pregnancy also can cause an effect in periodontal disease. The using of periodontal therapy causes a reducing of the disease's risks in pregnancy and save the pregnancy.

.References :

1. Ovadia R, Zirdok R, Diaz-Romero RM. Relationship between pregnancy and periodontal disease. *Med Biol (Milano)*. 2007;14:10-14.
2. Armitage GC. Bi-directional relationship between pregnancy and periodontal disease. *Periodontol* 2000. 2013;61(1):160-176.