Prenatal dental care and periodontal health: a concise systematic review

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Abstract

Introduction: Periodontal disease is a chronic infection caused by a bacterium that stimulates the immunoinflammatory response, leading to inflammation of the gingival and tooth support tissue, resulting from the pathogenesis of the microorganism and the host's response. Studies have investigated the association between periodontal conditions and possible complications for pregnant women and newborns. Objective: Analyzed the main consequences of periodontal disease during pregnancy and childbirth, as well as changes involving newborns, in order to elucidate the importance of prenatal dental care. Methods: The present study was followed by a systematic literature review model, according to the PRISMA rules. Clinical studies included case reports, retrospective, prospective and randomized trials. The quality of the studies was based on the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument. Results: A total of 104 articles were found. A total of 48 articles were evaluated in full, and 20 were included and discussed in this study. The overall assessment did not result in significant risks that could compromise the science of the present study. According to the GRADE classification, the studies were of moderate quality. Gingivitis, periodontitis, and tooth loss were found to be associated with premature birth. Periodontal disease can increase the chance of negative neonatal and maternal outcomes, with fetal growth restriction, vulvovaginitis, and premature rupture of the membrane being the main effects. Conclusion: Oral health should be an important focus in the monitoring of pregnant women in all maternal and child health services, making it necessary to incorporate the diagnosis of maternal oral health and periodontal disease for the health of the mother and newborn.

Keywords: Periodontal disease. Chronic infection. Pregnant. Newborn. Prenatal dental care.
disease with preterm birth [4].

In this sense, several complications associated with PD, such as gestational diabetes, pre-eclampsia, intrauterine growth restriction, early abortion, premature birth, low birth weight, and increased risk of early neonatal infection are reported in the literature. Therefore, investigating the impact of PD on pregnant women, as well as the negative outcomes for the newborn, is extremely important for health care [8].

Therefore, this concise systematic review study analyzed the main consequences of periodontal disease during pregnancy and childbirth, as well as changes involving newborns, in order to elucidate the importance of prenatal dental care.

Methods

Study Design

The present study was followed by a systematic literature review model, according to the PRISMA rules. Access available at: http://www.prisma-statement.org/

Data sources and research strategy

Clinical studies were included as case reports, retrospective, prospective and randomized trials with qualitative and/or quantitative analysis. Also, some review studies were included. Initially, the keywords were determined by searching the DeCS tool and later verified and validated by the MeSH system (Medical Subject Headings, the US National Library of Medicine) to achieve consistent search.

MeSH Terms

The main MeSH Terms were Periodontal disease. Chronic infection. Pregnant. Newborn. Prenatal dental care. The literature search was conducted through online databases PubMed, Google Scholar, Ovid, Scopus, Web of Science and Cochrane Library.

Study quality and risk of bias

The quality of the studies was based on the GRADE instrument, with randomized controlled clinical studies, prospective controlled clinical studies, and studies of systematic review and meta-analysis listed as the studies with the greatest scientific evidence. The risk of bias was analyzed according to the Cochrane instrument.

Results

Literature Review and Discussion

A total of 104 articles were found involving prenatal dental care and periodontal health. Initially, was held the exclusion of existing title and duplications following the interest described in this work. After this process, the summaries were evaluated and a new exclusion was held. A total of 48 articles were evaluated in full, and 20 were included and discussed in this study (Figure 1).

Considering the Cochrane tool for risk of bias, the overall assessment did not result in significant risks that could compromise the science of the present study. According to the GRADE classification, the studies were of moderate quality.

In this context, preterm birth is a multifactorial health problem that represents a serious public health problem worldwide. In recent years, there has been an increase in scientific evidence suggesting associations between oral health status, particularly periodontal disease and tooth loss, and an increased risk of systemic diseases and various adverse pregnancy outcomes. Thus, a prospective study with 111 pregnant women (36 cases, 75 controls) analyzed the association between oral health indicators and premature birth in Mexico. Mean age was similar between cases and controls (24.29 ± 5.42 versus 24.89 ± 5.67). As a result, it was observed that gingivitis, periodontitis, and tooth loss were associated with premature birth [9].

Also, oral diseases were identified as a risk factor for low birth weight. In this regard, a cross-sectional observational study involving 300 pregnant women (mean age 25 years) who delivered infants in the last 24 hours with an age group of 21-30 years analyzed the association of maternal periodontal health with prematurity and low birth weight in newborns. When analyzing the frequency of brushing, it was observed that approximately 40% brushed three times a day while 35% brushed twice a day while the remaining 25% brushed only once a day. No statistical significance was obtained when comparing brushing frequency with gingival health. Likewise, no association was found between periodontal health and the birth of premature children with low birth weight [10].

Besides, a retrospective cohort study (142 medical records of pregnant women) investigated the impact of PD on the health of pregnant women and complications during pregnancy and childbirth, as well as negative outcomes for the newborn (such as infections, prematurity, low birth weight, and fetal growth restriction). Among women diagnosed with PD, the odds ratio for vulvovaginitis was 3.45 times higher (OR=3.45, p-value=0.050) and 5.59 times higher for premature rupture of membranes (OR=5.59; p-value=0.017). For newborns, the chance of fetal growth restriction was 11.53 times greater for pregnant women with PD (OR=11.53, p=0.041). Therefore, periodontal disease increased the chance of negative neonatal and maternal outcomes, with fetal growth restriction, vulvovaginitis,
and premature rupture of the membrane being the main effects [11].

Also, a cross-sectional study of 404 women investigated the prevalence and factors associated with periodontal disease in pregnant Sudanese women. The mean gestational age was 30.0 (8.7) weeks. The mean age and parity were 27.0 (5.7) years and 1.6 (1.7), respectively. Ninety-seven (24.0%) of these 404 women had periodontal disease, which was mild, moderate, and severe in 49 (12.1%), 36 (8.9%), and 12 (3.0%) women, respectively, while 307 (76.0%) women did not have periodontal disease. Age, parity, education, and brushing were not associated with periodontitis, however, lower gestational age was associated with periodontal disease (p=0.011) [12].

Furthermore, a study with 311 pregnant women evaluated the periodontal health of pregnant women and investigated the association of periodontal conditions with demographic and socioeconomic characteristics, as well as medical and dental history. The presence of visible plaque remained the main determinant of gingival bleeding (OR=2.91, CI=1.91-4.48). Pregnancy status in the first trimester was also a predictor, with a lower prevalence of gingival bleeding observed in the second (OR=0.87, CI=0.77-0.99) and third (OR=0.82, CI=0.73-0.93) quarters [13].

Also, an observational, cross-sectional study in Australia assessed the knowledge, attitudes, and practical behavior of Australian midwives regarding the periodontal health of pregnant women to inform about interprofessional prenatal care. One hundred responses were analyzed, including rural (n=23) and urban (n=77) midwives. Eighty percent of midwives agreed that maternal dental care can positively affect pregnancy outcomes. The use of fluoride toothpaste (19.1%) was wrongly answered to prevent gum disease more often than to control psychological stress (7.9%), a correct answer. Rural midwives demonstrated a significantly higher knowledge score (p=0.001) and significantly more positive practice behaviors to oral health (p=0.014) than urban midwives. Australian midwives have positive attitudes towards prenatal oral health but misunderstand the etiology and prevention of gum disease [14].
Based on these clinical studies, it is emphasized that periodontal disease in pregnancy begins with dental plaque and is accentuated by the action of hormones, mainly estrogen and progesterone, triggering greater vulnerability of the dental tissues, mainly due to edema and increased tissue vascularization dental [15,16]. Furthermore, there is a relationship between chronic diseases with low inflammation and an increased risk of developing gestational and neonatal comorbidities, which can be aggravated when associated with PD [6,17]. In this context, a small group of bacteria, predominantly gram-negative, anaerobic, or microaerophilic, that colonize the subgingival region [18].

In this scenario, the Ministry of Health in Brazil emphasizes the importance of oral hygiene for pregnant women, suggesting a healthier diet and frequent brushing, with at least one dental appointment during pregnancy. Furthermore, the Ministry of Health recommends guidelines and dental procedures during pregnancy to help protect the health of the embryo, fetus, and pregnant woman [19]. Authors observed that, in Brazil, the social representation of pregnant women about the gestational process is still a natural phenomenon, contributing to the lack of care during pregnancy, non-adherence and even avoidance of prenatal programs, and discharge incidence of severe gestational disorders [20].

Conclusion

Severe Periodontal Disease increased the chance of negative neonatal and maternal outcomes, such as fetal growth restriction, vulvovaginitis, and premature rupture of the membrane. Thus, oral health should be an important focus in the monitoring of pregnant women in all maternal and child health services, making it necessary to incorporate the diagnosis of maternal oral health and periodontal disease for the health of mother and newborn.

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Data sharing statement

No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

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References


Page 4 of 5


