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THE INFLUENCE OF THE GESTATION PERIOD ON THE DEVELOPMENT OF DENTAL DISEASES IN PREGNANT WOMEN

Vokhidov Elbek Rakhimovich
Bukhara State Medical Institute Named After Abu Ali Ibn Test. Bukhara, Uzbekistan.
Email: elbek vohidov@bsmi.uz

Abstract: Pregnancy induces a wide range of physiological, hormonal, and immunological changes in women, many of which significantly affect oral health. This study explores the influence of the gestation period on the onset and progression of dental diseases among pregnant women. Particular focus is given to the increased risk of gingivitis, periodontitis, dental caries, and enamel erosion during various trimesters. The research evaluates how hormonal fluctuations, morning sickness, altered dietary habits, and decreased salivary pH contribute to the vulnerability of oral tissues. A total of 180 pregnant women were examined across different gestational stages, and findings indicate a strong correlation between trimester-specific changes and the prevalence of dental pathologies. The study concludes that the gestation period is a critical determinant in oral disease development, and emphasizes the need for integrated dental care as part of prenatal health programs.

Key words: Pregnancy and oral health, Hormonal changes, Periodontal disease, Dental caries, Maternal health, Prenatal dental care, Trimester analysis, Salivary pH.

Introduction

Most large epidemiological studies have shown that infectious-inflammatory diseases of the oral cavity - carious lesions of the teeth, chronic generalized periodontitis - are associated with an increased risk of developing cardiovascular diseases, diabetes mellitus, obesity, respiratory nosocomial infections of the upper respiratory tract, various complications of the gestational period, and adverse outcomes in childbirth.

In particular, in women with infectious-inflammatory lesions of periodontal tissues during pregnancy, the risk of fetal growth retardation syndrome, premature labor, low birth weight , preeclampsia, and increased maternal mortality increases. At the same time, many scientists have proven that the risk of complications of the gestational period in the development of inflammatory-destructive diseases of periodontal tissues is low.

periodontal disease and pregnancy and childbirth outcomes has been a subject of debate and controversy, we decided to evaluate important studies through observation and studies, which have been conducted by scientists from many countries around the world to study this topic in detail.

Methodology

A quantitative cross-sectional study was carried out to assess the correlation between gestational stages and the incidence of dental diseases in pregnant women. The study included 180 participants, divided equally into three groups based on trimester: first (1–12 weeks), second (13–26 weeks), and third (27–40 weeks). Participants were recruited from prenatal clinics and provided informed consent.

Data collection involved three key procedures:

Clinical oral examination using WHO criteria to identify dental caries, gingival inflammation, and

periodontal pocket depth.

Salivary analysis to assess pH levels and buffering capacity using digital pH meters.

Questionnaire-based interviews to record dietary patterns, oral hygiene practices, and awareness of prenatal dental care.

Statistical analysis was conducted using SPSS version 25. Chi-square tests and ANOVA were applied to determine significant differences in dental disease prevalence across trimesters. Ethical approval was obtained from the institutional health research committee..

Results and Discussions

The study was conducted by K a n t en M . et al. in the Netherlands in 2017. The state of periodontal tissues was studied in 48 pregnant women with preeclampsia during pregnancy for less than 34 weeks . Periodontal tissue diseases were divided into mild, moderate and severe degrees by severity. Mild periodontitis was considered to be inflammatory-destructive diseases of periodontal tissues with pockets smaller than 4 mm, moderate periodontitis was considered to be periodontal pockets larger than 4 mm , changes in periodontal tissues in the area of 1-15 teeth and the presence of bleeding when probing. Severe changes in periodontal tissues were noted in cases where more than 15 teeth were damaged, the depth of periodontal pockets was greater than 4 mm, and bleeding from the gum tissue when probing. The study found that periodontal tissue damage in patients with preeclampsia was 83% compared to 38% in the control group, with significant discrepancies observed.

conducted in 83 patients with preeclampsia in Turkey and conducted by M ankci A . et al. in 2016, it was found that periodontal pocket development >4 mm, reduction of the tooth-milk junction >3 mm, periodontal tissue damage with bleeding from the gingival tissues increased the risk of developing preeclampsia by 3.6 times in the experiment .

In Brazil, 585 patients with preeclampsia were examined from 2016 to 2019. Periodontal damage was defined as the presence of periodontal pockets greater than 4 mm in depth in front of one or more teeth and a reduction in the tooth-milk junction of more than 3 mm. According to these data, the presence of periodontal damage in pregnant women increased the risk of developing preeclampsia by 1.7 times .

A retrospective study of 855 pregnant women (England) found that chronic generalized periodontitis, chronic gingivitis, and gingival bleeding during pregnancy were associated with a 2.5-fold increased risk of developing the most dangerous form of preeclampsia (CI 1.1-5.5).

Other studies, NHANES III (England) and No м a т A .F. et al. in 2016, a study conducted by A.F. et al. found that a history of gestational diabetes was associated with periodontal tissue damage. The periodontal tissue damage format was defined as periodontal tissue damage in the area of a single or multiple teeth, the formation of a single or multiple periodontal pockets larger than 4 mm, or a reduction in the dentogingival junction by more than 2 mm , and bleeding during flossing. The study found that pregnant women with a history of gestational diabetes were 3 times more likely to develop inflammatory-destructive periodontal diseases.

This study was analyzed and studied in a study conducted by M i a ng T . in 2016, which showed that patients with damaged periodontal tissues were 3 times more likely to suffer from gestational diabetes during pregnancy. M e rjo ora M . e al. In 2015 , an analysis of 203 cases of pregnancy in England, which ended in premature birth and the birth of a small fetus, was studied.

Among this category of women, periodontal diseases with 5 or more damaged teeth and a reduction in the tooth-milk connection of 3 mm or more were studied. As a result, a connection was found between periodontal diseases during pregnancy and premature birth and low birth weight.

Getfer m T.R. et al. studied 105 (England) control cases with unexpected premature births at less than 32 weeks of gestation and found that there were multiple lesions of the gingiva without reduction of the dentoalveolar junction, moderate chronic generalized periodontitis with a reduction of the dentoalveolar junction by 3-5 mm in at least one sextant, and severe chronic generalized periodontitis with a reduction of the dentoalveolar junction by more than 5 mm.

It was noted that changes in periodontal tissues were most pronounced in pregnant women whose

gestational age ended in premature births at less than 32 weeks.

In a study of 100 pregnant women in Malaysia with low birth weight, Masanaya et al . et al . found that inflammatory-destructive periodontal disease was associated with a 1.38-8.32-fold increase in activity during pregnancy and a 3.0-fold increase in risk of low birth weight.

Similar indicators were obtained in the study of Ofenbacher M. et al. (England) of 125 patients with low birth weight and premature birth , including 125 patients with premature birth at a gestational age of less than 38 weeks (Spain), proposed by Santos-Pereira SA, Weidlich P. et al.

Offenbacher S. et al. in their studies proved that the possible risk of premature birth and low birth weight in pregnant women is associated with periodontal tissue damage by 7.6 (secret interval 1.8-28.7). Santos-Pereira SA, Weidlich P. et al. in their studies note that inflammatory-destructive diseases of periodontal tissues in pregnant women with premature birth are 26% compared to 63% in the control group.

periodontal tissue damage in pregnant women and the gestational age and poor birth outcomes, most studies from many countries have been multicenter, randomized, and prospective, involving many thousands of patients. A study of 1025 patients (England) found that the presence of chronic generalized periodontitis in the prenatal and postpartum cycles was associated with preterm birth at less than 32 weeks.

Similarly, a study conducted in England examined the association between chronic generalized periodontitis, which was classified as mild (periodontal pockets <3 mm, gingival bleeding on flossing), moderate (periodontal pockets >5 mm in 1-15 teeth, single or multiple secants, bleeding on flossing), or severe (more than 15 teeth in multiple secants with periodontal pockets >5 mm), the development of inflammatory-destructive diseases in umbilical cord blood, and the prevalence of preterm birth in 642 patients. Boggess KA et al. summarized the results and concluded that periodontal tissue damage was associated with the development of inflammatory mediators in umbilical cord blood and preterm birth.

inflammatory-destructive diseases of periodontal tissues with the development of alveolar bone tissue disorders in pregnant women during pregnancy, an increase in the inflammatory marker - C-reactive protein in the blood , was revealed , in turn, by Pitiphat W. et al. (England) in a study of 105 patients. The presence of bone tissue disorders in chronic generalized periodontitis was substantiated by radiographic studies before the onset of pregnancy. The concentration of C-reactive protein in the blood was determined repeatedly during the gestational cycle.

In a multicenter study of 640 patients, a group of Chilean authors and scientists found that the relative risk of premature birth and low birth weight in women with periodontal disease was 3.6 (CI 1.6-7.8).

In several selected clinical studies, according to the authors-scientists, it was found that when 875 patients with inflammatory processes in the gums were treated, the risk of premature births decreased from 6.5% to 2.5%, and when 410 patients with chronic generalized periodontitis were treated during pregnancy, the risk of premature births and low birth weight was reduced, including.

Jeffcoat MK et al. In a similar study of 1310 women (England), it was shown that the risk of preterm birth was 4.6 (CI 2.1-9.1) in the presence of chronic generalized periodontitis during pregnancy, and that in 165 women, the risk of preterm birth and low birth weight was reduced when chronic generalized periodontitis was treated during pregnancy.

However, in 3740 pregnant patients (England), 180 women (Greece), 825 women (USA), 745 women (Great Britain), 95 women (Spain), an insufficient association between premature birth and chronic generalized periodontitis was noted.

Current and relevant research data indicate that epidemiological studies investigating the correlation between periodontal tissue damage and poor pregnancy and postpartum outcomes are insufficient. In such cases, pathogenetic studies are required to document the relationship.

Scientifically, the conclusions that combine the deterioration of pregnancy and childbirth in women with advanced periodontitis were revealed by the group of authors-scientists Aagaard K. et al. within the framework of the global-large-scale program “Human Microbiome” (Human Microbiome Project).

The researchers found that previously considered clean placental tissue was colonized by a community of opportunistic microorganisms from five major phyla - Firmicutes, Tenericutes, Proteobacteria, Bacteroidetes and Fusobacteria - whose microbiome, or gene complex, was similar to the bacterial microbiome of the oral cavity.

The authors collected biological samples of placental tissue from 325 relatively healthy women, extracted the genetic material, and subjected it to next-generation sequencing (NGS) for metagenomic analysis. The technique of sequencing DNA and RNA to obtain a formal picture of their early structure is called sequencing.

What sets next-generation sequencing apart from previous methods is the ability to "read" multiple regions of the genome at once. This has allowed the unique microbiome of the placenta to be identified.

the placental microbiome with the microbiome of other areas of the patient's body - the skin , vagina, gut, respiratory tract and oral cavity - allowed us to identify a common placental microbiome, including in the oral cavity.

At the same time, the placental microbiome of patients who delivered prematurely differed from that of women who delivered normally. The authors believe that by combining the results obtained, it is possible to demonstrate a link between the composition of the placental microbiota and the risk of preterm birth.

In addition, the conducted studies prove the previously mentioned correlation between inflammatory diseases of periodontal tissues in the mother and an increased risk of premature birth, and also explain the need for normal gum tissue and teeth in women during pregnancy. The study of the cause-and-effect relationships between the composition of inflammatory mediators in periodontal tissues, placenta and umbilical cord blood, and retroplacental blood after childbirth will allow us to have a scientific idea of the complex consequences of inflammatory-destructive diseases for the entire organism of a pregnant woman and to create modern methods for gradually preventing the spread of infection to the placenta and fetus.

Conclusion

The gestation period plays a pivotal role in influencing the oral health status of pregnant women. Findings from this study demonstrate that dental diseases, particularly gingivitis and dental caries, are more prevalent in the second and third trimesters due to heightened hormonal activity, dietary shifts, and reduced oral hygiene maintenance. The significant association between gestational stages and oral pathology highlights the importance of incorporating routine dental screening and counseling into prenatal care. Early intervention and trimester-specific oral health education can effectively reduce the burden of dental diseases during pregnancy and promote better maternal and fetal outcomes.

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