LUMEN ET VIRTUS

Periodontal diseases in pregnant women: The relationship between the disease and the birth of premature or low-weight babies

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ABSTRACT

Objective: This narrative literature review article aims to highlight the relationship between periodontal disease in pregnant women and the birth of premature babies, who are born with low birth weight or with both problems, initially addressing what periodontal disease is, how it manifests itself, what it causes to oral health, so that later, it can be addressed how this condition in pregnant mothers can be associated with these sets of problems triggered in their respective babies. Methodology: To construct this article, a strategic methodology was outlined that could bring the maximum number of articles, books, monographs, course completion papers, doctoral and master's theses, so that a set of proven information could be obtained that would bring richness to this study.

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Thus, online searches were carried out in the following databases and websites: BVS/BIREME, DeCs, Scielo, Web of Science, PUBMED Central, Science Direct, CAPES Journal Portal, LUMEN ET VIRTUS Magazine, The Cochrane Library, PROSPERO, FT Magazine, Research, society and development journal in conjunction with Google Academy. In order to acquire a set of current, rich and scientifically proven information, the following descriptors were used in the online searches: Periodontal Diseases; Premature Newborn; Pregnant Women. Results: After several analyses and research in different studies by different actors, it was seen that periodontal disease in pregnant mothers is related to the birth of premature babies, with low weight or with both problems, having scientific evidence and sufficient basis to reach this conclusion.

Keywords: Periodontal Diseases, Premature Newborn, Pregnant Women.

INTRODUCTION

In today's world, new diseases are emerging and with them old diseases, viruses, bacteria, infections and other old and classic problems reappear or intensify. When it comes to the oral cavity, a classic infection that is extremely common within society is periodontal disease. A "healthy" periodontium has the function of surrounding the root part of the teeth and the alveolar bone, maintaining the integrity of the oral mucosa, serving as an insertion for the tooth in the bone tissue of the mandible and maxilla, in addition to being an important protector, also called protective or supporting periodontium, because of its main functions (Borgo et al., 2014).

During pregnancy, the expectant mother finds herself at a time in her life where she needs to take care of her health, maintain habits of care, prevention and health promotion, mainly because the attitudes she takes towards her body will be reflected in the development of the fetus. This care does not restrict itself to the mouth, in fact it includes it, and it is extremely necessary for the pregnant woman to have periodic dental check-ups so that the baby's development is not affected by oral problems. Although there is scientific evidence showing the need and importance of oral maintenance during pregnancy, most pregnant women have little idea of how much care for the oral cavity can contribute to or harm the development and health of the fetus, especially when it comes to hygiene. Studies and research carried out around the world indicate how much maternal periodontitis can have negative effects on the baby during pregnancy, impairing its development and even bringing about an early birth, causing weight gain or a combination of both problems (Pereira et al., 2016).

Thus, it is seen that during pregnancy it is essential that the gestation is carried out with periodic visits to the dentist, who will analyze the structure and oral condition of the mother, providing procedures that promote vitality and hygiene for her, and in this way, the child will also receive the same benefits. Thus, this narrative literature review article aims to highlight the relationship between periodontal disease in pregnant women and the birth of premature babies, who are born with low birth weight or with both problems, initially addressing what periodontal disease is, how it manifests itself, what it causes to oral health, so that later, it can be addressed how this condition in pregnant mothers can be associated with these sets of problems triggered in their respective babies.

METHODOLOGY

To construct this article, a strategic methodology was outlined that could bring the maximum number of articles, books, monographs, course completion papers, doctoral and master's theses, so that a set of proven information could be obtained that would bring wealth to this study. Thus, online searches were carried out in the following databases and websites: BVS/BIREME, DeCs, Scielo,

Web of Science, PUBMED Central, Science Direct, CAPES Journal Portal, Revista LUMEN ET VIRTUS, The Cochrane Library, PROSPERO, Revista FT, Research, society and development journal in conjunction with Google Academy. The research carried out by the author named Rother (2007) was used in the construction of this literature review article, as it is a study that points out how the approach taken in a narrative review should be, pointing out how the methodology should be done and how to structure an article of this type. In order to acquire a range of current, rich and scientifically proven information, the following descriptors were used in online searches: Periodontal Diseases; Premature Newborn; Pregnant Women.

RESULTS

PERIODONTAL DISEASES

The pathological conditions that affect the supporting structures of the periodontium are called “periodontal diseases”, a term that encompasses the pathological conditions located in this protective area. The pathogenesis and etiology of periodontal diseases have become a widely studied subject in recent years, with new concepts being created within the area, altering some old concepts, so that the study of periodontitis is the most current, modern and with up-to-date scientific knowledge. Thus, the classification of periodontal diseases is and needs to be constantly redefined, so that it is always up to date with new discoveries and advances in the area (Novak, 2002).

The term “Periodontium” is used to refer to the tissues that surround the teeth, with some structures standing out in these tissues, such as the alveolar bone, gum, periodontal ligament and cementum, with the periodontal ligaments being structures that fix and join the alveolar bone and gum to the cementum of the tooth. Nowadays, there are several different periodontal diseases that are present in society and are extremely common in people of different ages and genders. They are divided into two distinct groups: periodontitis and gingivitis. In the case of periodontitis, the soft tissues are altered together with the hard tissues, such as bone, cementum and periodontal ligament. In gingivitis, the alteration will affect the area composed only of the gum, which is the only altered structure, unlike periodontitis, which comprises the soft and hard tissue together.

When microorganisms adhere to the surface of the tooth and subsequently join the gum, harmful changes occur in the oral cavity, with gingivitis being one of the most common. From this, a space between the gum and the tooth called the "gingival sulcus" increases in size, becoming known as a "pathological pocket". However, if the gingivitis microbes are eliminated, the gingivitis regresses and the gum returns to its normal state. From gingivitis, it can be safely said that if gingivitis is not treated, the pathological process tends to advance until it reaches the hard tissues, abruptly or gradually, giving rise to periodontitis, with the reabsorption of the alveolar bone and the

disappearance of the periodontal ligaments being the main changes presented in periodontitis (Armitage, 199).

PREMATURE BABIES

A baby is considered premature when born with a gestational age of less than 37 weeks, while those born with less than 28 weeks are considered extremely premature babies. A baby who is born prematurely causes trauma to him and his mother, who needs to distinguish between the imaginary baby she created in her head and the reality in which he finds himself, a baby who is very small, with no facial features that relate him to the appearance of his parents and family, in addition to being born extremely fragile, far from being the idealized and imaginary baby created in the family's conception, who would be born chubby, healthy and with an appearance reminiscent of the family to which he belongs (Lima & Maldonado, 2007). A baby born prematurely is at risk of psychosocial and biological risk, placing the child in a situation where his/her development is affected, requiring frequent hospital visits due to his/her compromised immunity and health, which brings with it a set of health problems and illnesses, in addition to the emotional and psychological difficulties that parents find themselves in, as they are visualizing the state that their child is in, which is no longer something that affects only the child, but that begins to affect the emotional side of the parents as a whole (Linhares, 2003; Doering et al., 2000; Klaus et al., 2000).

Thus, it is seen that in addition to premature birth generating consequences for the health and life of the premature baby, this fact causes a family crisis, feelings of guilt, fear and maternal anxiety generated by this early separation of mother and baby (Ministry of Health, 2002; Klaus et al., 2000). Premature births from an etiological perspective can be classified in two ways: indicated preterm birth, caused by an interruption of pregnancy resulting from fetal or maternal complications, such as hemorrhages, fetal distress, hypertensive disorders or multiple pregnancies resulting from assisted reproduction; the other form is spontaneous preterm birth associated or not with premature rupture of the membranes (Montenegro & Rezende Filho, 2014).

BABIES BORN WITH LOW BIRTH WEIGHT

According to the World Health Organization, a newborn is considered to be underweight if he or she is born weighing less than 2,500 grams (World Health Organization, 1976). Premature birth and low birth weight are consequences that normally occur in pregnancies in adolescents, when compared to the frequency in which this occurs in adult women. In addition to the biological, behavioral and socioeconomic risks that are linked to this situation in which mothers are adolescents, there are other factors such as: malnutrition, maternal iron deficiency anemia, urinary

tract and volvulus-vaginal infections, low weight at pregnancy and hypertensive disease, which are problems that can contribute to several neonatal problems (Maia Filho et al., 1999).

One of the things that has the greatest impact on a child's development is the weight at birth, which has an impact on the first month of life and throughout the child's biological maturation, physical growth, cognitive and mental capacity, and the entire organism as a whole (Barbas et al., 2009; Carniel et al., 2008). The weight at birth is also one of the factors related to neonatal, postnatal and infant mortality, being an isolated influencer that is also related to the degree of risk of developing diseases during adulthood, being directly connected to infant morbidity (Carniel et al., 2008). One form of protection against infant mortality is the “birth weight” factor, with a value of 3,000 to 3,999 grams being the most favorable and ideal weight (Barbas et al., 2009).

FACTORS THAT RELATE PERIODONTAL DISEASE AND THE BIRTH OF PREMATURE BABIES, BABIES WITH LOW BIRTH WEIGHT OR BOTH

Physiological mechanism of labor

The quality of life and health of most pregnant women can be directly influenced by the condition of their oral cavity, from any developing pathology to the state of hygiene of the baby. These factors will not only impact the pregnant woman, but will also influence the development and life of the developing baby. Problems caused by poor oral hygiene can impact the mental, social and physical health of the mother, mainly due to the fact that the body of a pregnant woman undergoes physiological changes that are extremely important for the formation of the fetus and that the mother needs to be in good condition until delivery, due to the high risk of acquiring serious problems, such as infections that are more susceptible during pregnancy, together with the inflammatory process that already exists during this time. From this, it is clear that during pregnancy, women are predisposed to inflammatory processes. Furthermore, during this period, women have some difficulty maintaining a healthy diet, eating a lot of sugar, which is a factor that will trigger an increase in bacteria in the oral cavity. When combined with this predisposition to acquire infections and obtain inflammatory responses, it will facilitate the development of gingivitis and periodontitis during pregnancy (Teixeira lu, 2019).

Through research, several studies indicate that the physiological mechanism that involves the onset of labor is still something that has not been fully discovered by medicine, an event that has a set of factors that are related to each other at this time. Studies explain that during the onset of labor, there is an increased concentration of PGE2 within the composition of the amniotic fluid, which leads to the belief that prostaglandin induces labor. Thus, the prostaglandin theory is the most accepted in the scientific community. When there is an accumulation of bacteria on the tooth surface, there is an increase in the inflammatory responses of the periodontal tissues, making them

reservoirs of inflammatory mediators in high concentrations, such as prostaglandin (PGE2) and TNF-α (tumor necrosis factor alpha). Periodontal infections are large reservoirs for gram-negative anaerobic microorganisms, endotoxins and lipopolysaccharides, thus being another form of infectious and inflammatory exposure for the fetus and placenta, threatening the gestational period as a whole (Williams et al., 2000).

Hormonal changes caused by pregnancy

A woman's life cycle is made up of several distinct physiological processes, pregnancy being one of them, during which the woman goes through a series of physical and emotional changes. During this period, a range of hormonal changes occur, represented by an organic adaptation to maintain the pregnancy, in addition to promoting anatomical, local, systemic and physiological changes in the female body. During pregnancy, the gingival tissue undergoes several changes, such as increased tissue permeability, together with vascularization and an exacerbated response to local irrigators.

Women who are going through pregnancy have an increased level of hormones such as progesterone and estrogen, which ends up influencing increased tooth mobility, depth of the gingival sulcus, local irrigators, inflammatory response and gingival fluid. Changes in gingival tissue during pregnancy are a factor that can lead to the development of periodontal disease. Hormonal increase is not a factor that will necessarily cause periodontitis, these hormones alone will not cause periodontal infections, however, if the woman has poor oral hygiene habits even before or during pregnancy, they become predisposed to developing or having a worsening of periodontal disease (Alves et al., 2007).

Lack of health education

The definition of health education is: any combination of learning experiences designed to facilitate voluntary actions that lead to health. In addition to its meaning, it can also be defined as a process that aims to modify people's behavior in relation to health. Through health education, patients are induced to change their health habits and create their autonomy, through actions aimed at knowledge about the health-disease processes, in addition to addressing the risks of poor oral hygiene and how they should protect it (Reis et al., 2010; Biesbrock et al., 2003; Splieth & Christiansen, 2005).

Secondary and tertiary care services should decrease when there is an increase in health promotion, both for the individual and the collective, through multidisciplinary actions, with the dentist being one of the main professionals who should be involved in this health promotion and education, carrying out the prevention and treatment of diseases that affect the oral cavity, such as

periodontal disease, aiming to reduce the systemic and local damage caused by the presence of this infection in the oral environment (Gonçalves et al., 2010). Pregnancy is an extremely important phase in a woman's life, a time when women are more receptive to changes and the incorporation of new attitudes and behaviors, mainly because they are carrying a life, a child, which makes them review many issues and behaviors that can improve the life and health of the baby. Therefore, it is extremely necessary and essential that pregnant women participate in health promotion movements and programs, so that they become agents of information and health promotion within their family, taking care of their oral hygiene, which will reflect on the life of the baby who is developing and serving as an example within the home (Melo et al., 2007).

Visits to the dentist during pregnancy

A pregnancy, whether high-risk or not, must be monitored throughout its course from the beginning, requiring comprehensive monitoring of both the pregnant woman and her family members, with periodic assessments by nutritionists, psychologists, dentists and other health professionals (Silva et al., 2020). During pregnancy, the woman's sex hormones increase, presenting a significant change in the development of periodontal disease, with the periodontal tissues being exposed to inflammatory changes triggered by inflammatory changes caused by bacterial plaque located on the tooth surface, such as hormonal changes, such as increased levels of progesterone and estrogen during pregnancy (Rodrigues et al., 2018). From this, it is concluded that dental visits are necessary, offered and recommended by the guidelines of the Ministry of Health, which in theory provides all care during the prenatal phase, but in reality there is still a low demand among pregnant women, leading to a lack of dental services (Teixeira lu, 2019).

The Ministry of Health states that dental treatments should be performed even if the woman is pregnant, with the ideal period for visits being during the second trimester, when the procedures can be performed without causing harm to the baby and the mother. Thus, it is seen that pregnant women can and should go to the surgeon during pregnancy, so that procedures such as scaling, prophylaxis and the application of fluoride are performed throughout the pregnancy in any trimester, so that pregnancy gingivitis can be avoided. In this way, these procedures aim to prevent possible problems that may end up developing in the oral cavity of the pregnant mother, which may subsequently affect the baby's health, being procedures that, in addition to preventing, can even reduce the severity of these inflammatory changes such as gingivitis (Moimaz et al., 2017; Ministry of Health, 2018).

DISCUSSION

One of the most common problems with dental treatments is fear, which is related to the noises of the high-speed pen, the various sharp instruments, the dentist's attire, which is usually white, which creates a certain fear in patients, among other equipment and aspects of the dental office that generate fear in patients. During pregnancy, most pregnant women already have a fear of the dentist later on, which ends up getting worse during pregnancy, due to the fear that this will negatively affect the child's development, or because there is already a certain trauma in the life of this particular woman and that with the altered hormone levels due to pregnancy, this fear can end up being intensified (Albuquerque et al., 2004).

Thus, it is seen that there is a certain "culture" in society that dental treatments would harm the baby during pregnancy, which highlights the need and importance of health education, showing that there is an urgency within the globalized world. From this, it is necessary to create health promotion events and NGOs that address the need for dental treatment in the life of the pregnant mother and the child in the future, showing the amount of positive points that will be attributed to both the baby and the mother, showing what are the risks and problems that can occur when the necessary procedures are not performed during this phase, so that in this way, the myth that a visit to the dentist will harm the baby that is being gestated. However, it is extremely important that the dentist knows which treatments should or should not be performed in each specific case of pregnancy, analyzing the history of diseases, treatments previously performed, the mother's oral health status and how the pregnancy is going for the respective pregnant woman, so that procedures can be performed that will add to the balance of the mother's and baby's bodies (Silva et al., 2006; Polleto, 2001).

During pregnancy, it is extremely important to properly clean the oral cavity, based on two main factors: during pregnancy there is a need to eat well and correctly, avoiding cariogenic foods. Therefore, if this really occurs, pregnant women would not have toothache, tooth mobility, or periodontal infections, which could come into contact with the bloodstream, stimulating the production of inflammatory cytokines, which is one of the constituents presented in premature births or in low-weight babies. In addition, although pregnancy ends up intensifying the inflammatory response in the gum tissue, for periodontal infection to occur, the presence of dental biofilm in large quantities is necessary, accumulated on the surface of the teeth, which will only happen if the pregnant woman is not performing basic oral hygiene care (Hofling et al., 2006; Mascarenhas et al., 2003; Hugoson, 1971). It is important to highlight that pregnancy is not a period that is synonymous with "periodontal complications", but that it is in fact a phase in which several hormonal imbalances occur that can influence the development or worsening of periodontal infections, with periodontal

disease being a problem that has a predisposition due to a range of factors together, such as: poor hygiene, smoking, diabetes and other factors (Cruz et al., 2005).

The predisposition associated with the development of periodontal disease is also related to other factors, such as access to information, oral health services, economic status, hormonal changes, systemic diseases in pregnant women, among others. The hormones progesterone and estrogen are more prevalent in women's bodies than in men's, and therefore, women are more sensitive to hormonal changes than men. Both hormones increase in quantity during pregnancy, and research has shown that for this reason, the female body during this phase is more likely to have harmful effects on its tissue metabolism, including an increased incidence of periodontal diseases in women who are going through pregnancy, as well as a greater likelihood that this condition will be aggravated by this associated and intensified hormonal factor (Santos & Phillon, 2009; Almeida et al., 2006).

Therefore, it is seen that every woman who is going through the pregnancy period should go to the dentist, so that he can make the necessary considerations about the state of her oral health, perform the necessary procedures that will improve the health of the baby and the mother. In addition, it is essential that there is an interprofessional relationship, where other health professionals know how to guide pregnant women about the importance of prenatal dental care (Moimaz, 2016; Swati et al., 2013).

In this way, health problems located in the oral cavity region do not only impact the structures that make up this cavity, as many people think. Oral health is actually linked to the entire body, such as periodontitis, which can impact the child that is being gestated. Therefore, it is necessary for people to understand once and for all that the state of the mouth can and most of the time reflects on the other structures and organs of the body, which must be monitored as well as the body in general, being all interconnected, requiring that people stop giving importance only to periodic visits to the cardiologist, endocrinologist, otolaryngologist and other medical professionals, being extremely important that the dentist be included in this list of professionals that people in society visit periodically, being all important for the elevation, promotion and care of the health of the human organism, where both medicine and dentistry must be seen as necessary and with the same level of importance within society and the lives of individuals (Capri, 2020).

CONCLUSION

Thus, it is seen that there is a relationship between the birth of premature babies, low birth weight babies or both, with a range of scientific evidence and proof that point to this influence that periodontal infection can trigger in babies during pregnancy, showing that it is crucial that every woman during pregnancy makes periodic visits to the dentist, who will be responsible for carrying

out the necessary procedures within the needs and particularities of each respective pregnancy. In addition, the government's contribution is extremely important, which must create institutions that provide dental treatments for people with less purchasing power, who often do not go to the private dentist due to the high cost, which also happens to many pregnant women who do not have good financial conditions. Health education is seen as an important contributor within society.

Through health education, more women could have access to more essential information on how to take care of their oral hygiene, in addition to knowing how this can impact the life of a future child. Thus, the conclusion is reached that NGOs and health education plans need to be created, with the aim of creating lectures in public places, raising awareness among pregnant women about oral hygiene, and even providing basic dental care on site. From this, it is seen that periodontitis can cause these three different problems if the pregnant woman has this infection.

However, even though there is already scientific evidence that proves this fact, it is extremely important that more research and studies are carried out on this aspect, so that more support is obtained than what already exists, so that it can later be published, reaching dentists who do not yet have such knowledge, which will improve the health of the pregnant woman when the dentist obtains this information, so that he can later pass it on to pregnant women, contributing to the development and life of the baby that is being gestated.

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