v. 3, n. 54, 2023

International Journal of Health Science

ORAL CHANGES IN PREMATURE BABIES

Nichole Callegari Peraro
Undergraduate student in Dentistry at ``Universidade Vale do Rio Verde`` – UNINCOR

Simone Cerqueira Ferreira
Professor of the Graduation Course of Dentistry at ``Universidade Vale do Rio Verde`` - UNINCOR

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).

Abstract: In deliveries that occur between the 22nd and 37th week of pregnancy, the newborn is called premature, and the earlier the delivery, the lower the structural and organic development of the fetus, and consequently, the greater the risk and severity. of neurological, motor, cardiac, pulmonary, ocular and oral alterations. The aim of this bibliographical review is to instruct parents and guardians, regarding premature patients, and regarding the present oral alterations and the way of treating them. Among oral alterations, the most frequent is enamel hypoplasia. Palatal morphology undergoes changes, as well as a higher incidence of caries and periodontal disease according to the degree of motor difficulty presented by the patient, and a higher incidence of Pseudomembranous Candidiasis. In addition, due to palatal alteration, premature infants often have difficulty speaking and chewing, as well as unfavorable aesthetics.
Keywords: Premature. Oral changes. Pre-Term

INTRODUCTION

Pregnancy is a period of more or less 40 weeks, with a period of 259 days being defined, starting from the first day of the last maternal menstrual period, as the ideal number of weeks of gestation. (RIBEIRO et al., 2013)

The newborn considered premature is so called due to the stage of pregnancy in which he was born, these must be born before the 37th week of pregnancy. It can also be considered for its low weight, being classified as; underweight (<2500g), very underweight (<1500), extremely underweight (<1000). Several factors can lead a pregnancy to prematurity; infections, social, economic and environmental problems, contact with toxicities, genetic or nutritional factors. (DINIZ et al., 2017)

Premature children do not go through the last gestational stages, being born months earlier, this fact is as much worrying, due to the serious health problems that such babies can suffer, such as respiratory, cardiovascular, gastrointestinal, infectious, neurological, sensory problems, metabolic dysfunction, some problems of development and growth, among these are oral alterations. (MANDIet al., 2012)

The oral alterations that a preterm child can get encompass; Dental hyperplasia, delayed tooth eruption, prevalence of fungal disease called pseudomembranous candidiasis, changes in oral structure, cleft palate and malocclusion. These dysfunctions occur due to the treatments that the premature child is submitted and their health condition, 2011)

The literary review was approached to inform about the oral alterations that premature infants may have, a subject that nowadays is not much discussed or explained, due to lack of knowledge, there are few authors who publish articles on the subject, which is of It is extremely important for the knowledge of parents and guardians, so that they can find prevention for their premature babies or even treatment.

A qualitative data analysis will be carried out, in the form of a bibliographical, exploratory, applied review, with the articles being searched on sites such as SCIELO (Scientific Electronic Library On-line), respecting the time interval between 1984 and 2017. The objective of this work is pay attention to parents and guardians about these changes, how to approach these patients, and how to treat them, and they must refer the children so that they can carry out preventive measures in order to avoid invasive approaches and better results serious. The role of the dentist together with the pediatrician in motivating and instructing premature patients, the family nucleus and pregnant women is of paramount importance.

LITERATURE REVIEW

The World Health Organization (2012), considers as preterm or premature, every newborn with less than 37 weeks, counting from the last menstruation of the child's mother. We consider extremely premature babies with a gestational age of 28 weeks or less, 28 to 32 weeks are considered very premature, and 32 to 37 weeks are considered moderate and borderline premature.

ETIOLOGY

Gestational age is expressed in days or complete weeks, ranges from 280 to 286 days after the onset of the last day of menstruation, considering 40 weeks of gestation. However, when delivery occurs between the 22nd and 37th week, we call it premature or preterm delivery. Childbirth at less than 40 weeks can be the result of; Premature rupture of the membrane, twin pregnancies, fetal malformation, uterine malformation, maternal illness and advanced age of the mother. (FERREIRA et al., 2015)

RISK FACTORS

The risk factors for prematurity were carried out by conducting interviews with mothers, and the responses were collected according to a structured form on sociodemographic, systemic, behavioral conditions, prenatal care and others. When evaluating the results, he defined the risk factors related to prematurity as: smoking, alcoholism, incomplete prenatal care, physical and psychological violence. According to this study, it is important to include pregnant women in prevention programs, reducing the risks of infections that may contribute to complications and undesirable outcomes in pregnancy. (VASCONCELOS et al., 2012)

GENERAL COMPLICATIONS OF PREMATURE

The musculoskeletal structure of premature babies shows loss of dexterity, loss or absence of voluntary contraction force, and hypotonia. These babies have neurological problems due to the delay in the maturation of the nervous system and in the myelination process. (SILVA et al., 2017)

Premature newborns are more likely to develop heart, lung, neurological and swallowing disorders. One must be suspicious of an alteration in swallowing when noticing signs and symptoms such as: weight loss, choking, irritation, cough, apnea, regurgitation, bradycardia, respiratory discomfort, stridor, cyanosis, food refusal, oxygen denaturation, and infections recurrent breathing (MUNHOZ et al., 2011)

ORAL CHANGES IN PREMATURE BABIES

Babies with very low birth weight had a higher prevalence of enamel changes, 70%, those with low or normal weight, this occurrence was 50% and 20%, respectively. (AGUIAR et al., 2003)

Newborn's weight	Enamel change (in %)
Very Low Weight	70%
Low weight	50%
Normal weight	20%

Table 1- Newborn weight ratio with alteration in tooth enamel - Personal Collection

In a survey, 15 premature patients with an average weight of 852g diagnosed with rickets in the neonatal period were selected to verify the relationship between enamel alterations in primary teeth. The average age of the children in the research was between three years and seven months, the presence of hypoplasia and opacity was recorded according to the criteria of the Federation Dentaire Internationale.

All children had enamel defects, and three

had only opacity. The most reported teeth were the lower canines and first molars, in the other 12 children hypoplasia was observed in at least one tooth, the most reported being the upper central and lateral incisors, followed by the upper and lower canines. Severe disturbances in calcium metabolism in the neonatal period can lead to the development of enamel defects in deciduous teeth, but this cannot be considered the only related factor. (SEOW et al., 1984)

Another research carried out with 45 babies born preterm, with very low birth weight, details in greater detail the alterations in the tooth enamel of premature babies, showing that children with less cortical bone mineralization of the humerus have a greater predisposition to enamel hypoplasia, assuming that, in mineral deficiency, the calcification of the teeth is interrupted, in an attempt to reach the mineral balance. (SEOW et al., 1984)

There are two main alterations in the enamel found in preterm babies, enamel hypoplasia (Fig. 1), nothing more than the alteration in the formation of ameloblastomas, which may result in small deformations in the enamel without clinical visualization, as it may also present large deep pit lesions horizontally around the tooth. The second, called Hypocalcification or Opacity (Fig. 2), when there is interference with enamel calcification, the element has an opaque white, yellowish or brownish color. (DINIZ et al., 2011)

Fig. 1 - enamel hypoplasia

Source: MACHADO et al., 2013

Fig.2 - hypercalcification or opacity in the enamel

Source: MACHADO et al., 2013

They observed that premature children or children who did not receive breast milk are more likely to have changes in the structures of the hard tissues of the teeth, due to the amount of calcium generated by the mother's milk during one week of the preterm newborn. (LUNARDELLI et al., 2006)

The search for prevention of enamel alterations in deciduous and permanent teeth. The use of vitamin D supplementation was evaluated. The research obtained a group of 32 premature children and 64 born at term, enamel defects were relevant in the first group, however the use of vitamin D did not reduce the presence of defects in the enamel of none of the dentitions, (AGUIAR et al., 2003)

Another factor that justifies preterm babies being more susceptible to changes in enamel is due to trauma associated with laryngoscopy and orotracheal intubation, as amelogenesis is in a critical period. (AGUIAR et al., 1996)

These prematurely born children must receive an even more reinforced oral health education, since the enamel alterations found in such children make them more susceptible to the development of carious lesions (NORÉN et al., 1983)

The prematurity of newborns has been described as a possible cause of delay in tooth eruption, without concrete explanations of how this could occur. Children with very low birth weight have fewer erupted deciduous teeth compared to children of low birth weight

or normal weight. (SEOW et al., 1984)

Dental eruption is the combination of several events that result in the appearance of the dental crown on the gingival margin, the tooth migrates from the intraosseous position to its functional position, both in the mandible and in the maxilla. Being part of child development. (DUARTE et al., 2011).

The eruption of deciduous teeth begins between 4 to 10 months of age, with the complete eruption of milk teeth up to 30 months of the child's life. (PATRIANOVA *et al.,2010)*

It was found that premature children have erupted teeth in the 39th week of postnatal life, while children born at term have erupted teeth in the 30th week. (DRUMMOND et al., 1992)

Permanent dentition		
Eruption	**Upper Teeth**	**lower teeth**
Central Incisors	7-8 years	6-7 years
Canine Lateral	8-9 years	7-8 years
Incisors	11-12 years	9-11 years
1st Premolar	10-11 years	9-11 years
2nd premolar	10-12 years	10-12 years
1st molar	6-7 years	6-7 years
2nd Molar	12-13 years	11-12 years
3rd Molar	17-30 years	17-30 years

Chronology table of deciduous dentition

Source: https://slideplayer.com.br/slide/1819008/

Some authors associate this delay in eruption to the length of stay of the tracheal tube during neonatal hospitalization. However, other factors can be associated, such as; endocrine disorders and hypothyroidism. (DRUMMOND et al., 1992)

A relative delay in the eruption of the primary dentition was observed in children who were breastfed after 6 months of age, relating the importance of children experiencing a diet that stimulates the growth and development of the stomatognathic system (PATRIANOVA et al., 2010)

Studies have shown that some alterations in oral structures, such as the formation of an arched palate, alteration in the development of the dental arches and fissures or ogival in the region of the hard palate, are more frequent in premature children and are linked to the pressure exerted by the orotracheal cannula or the laryngoscope, preventing the correct growth of structures. (DINIZ et al., 2011)

The literature suggests the correct use of suitable intraoral positioners so that the orotracheal tube can be correctly positioned, reducing trauma and preventing palatal deformities (ERENBERG et al., 1984)

Extremely low birth weight premature children have more cleft palates than children weighing more than 1 kg, this is related to the time the baby remained intubated and the suction movement, as the tongue plays a very important role in the formation of the palate. Depending on the damage caused, the removal of the cannula and the correct movement of the tongue allows the anatomical recovery of the palate in up to two years. (DUKE et al., 1976)

Breast milk has numerous qualities, among them are the reduction of morbidity in premature babies, the nutritional and immunological properties contained in it, stimulates gastrointestinal maturation, improves motor development and stimulates orofacial development. Proper muscle movement prevents developmental changes, malocclusions, in addition to preventing sucking habits. (DINIZ. et al., 2011)

Some characteristics were found in preterm newborns, which hinder the function of sucking food, consequently in breastfeeding, such as; excessive mouth opening, absence of fat pads on the cheeks, difficulty with jaw stability, difficulty breathing, and incomplete oral reflexes. These difficulties lead mothers to give up breastfeeding, leading to malocclusions. (HERNANDEZ et al., 1996)

Fungal diseases are also more susceptible

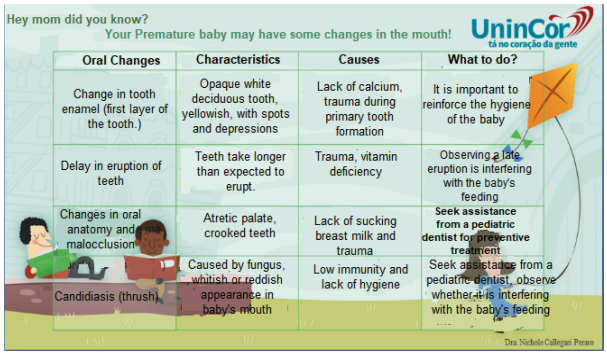
to babies who attend the neonatal ICU, and those who had asphyxia at birth were the most affected with acute pseudomembranous candidiasis, which were due to the use of devices for orotracheal incubation and also excessive use of antibiotics. Complications whose etiological agent is mechanical trauma, such as the use of orotracheal intubation and laryngoscopy maneuvers in newborns. (PANDOLFI et al., 2005)

MATERIALS AND METHODS

A qualitative data analysis will be carried out, in the form of a bibliographical, exploratory, applied review, with the articles being searched on sites such as SCIELO (Scientific Electronic Library On-line), respecting the time interval between 1984 and 2017.

Through the studies carried out on the subject, the diseases that most cause premature children were separated, so that a table containing; the oral alterations, the characteristics, the causes and finally what could be done in each one of them.

The tables were printed in the form of flyers and delivered to health centers and dental offices, in order to inform mothers or guardians about the possible oral alterations that the premature baby may have, facilitating the recognition of alterations and referral for prevention or treatment.



Source: Personal Collection – Flyer about oral alterations in premature babies

DISCUSSIONS

Systemic changes, metabolic and nutritional disorders and infections associated with mineral loss are linked as the major cause of defects in the tooth enamel layer according to (SEOW et al., 1984)

Lunaderlli (2006) associate enamel changes to neonatal nutritional disorders, relating the lack of calcium to the amount ingested during breastfeeding during the first week of the baby's life, but calcium changes can also be consequences of complications in pregnancy, in the delivery or in the neonatal period, bearing in mind that mineralization of the deciduous tooth begins in the fourth month of pregnancy up to one year of age.

Caixeta (2005), also classifies the lack of calcium as one of the hypotheses of alterations in the layer of dental enamel, due to the immaturity of the kidneys, liver and parathyroid glands, incapable of producing ideal amounts of calcium.

However, Norén (1993) considers local trauma as the primary cause of deformation in dental enamel, considering that newborns submitted to laryngoscopy and orotracheal intubation have a higher prevalence of hypoplasia and opacity, probably due to the pressure exerted on the alveolar ridge.

Diniz (2011) also reports in his studies that changes in enamel structures are linked to the pressures exerted by the devices that pre-mature or low-weight children are submitted to, such as orotracheal intubation and laryngoscopy.

The delay of deciduous dentition in preterm babies was reported through studies with children from six months to six years by the authors SEOW et al., (1986) and DRUMMOND et al., (1992) reporting the main cause the time of use of the neonatal apparatus that these children are submitted to at birth, in addition to other factors such as endocrine disorders and hypothyroidism.

Through studies with 1297 Brazilian children, he found that premature babies have a delay in the onset of deciduous eruption. But at the end of dentition this delay decreases (PATRIANOVA et al., 2010)

Ramos (2006) relates the late eruption of preterm newborns with the chronological age of their birth, that is, the delay in eruption may be linked to the early birth of the baby and not to late tooth development.

Diniz (2011) reports changes in the palate and dental arch, such as high palate and fissures, a consequence of the use of laryngoscopy and orotracheal intubation, and its pressure that prevents the correct growth of bone structures.

Other authors associate changes in the palate with the wrong way of positioning the intubation and laryngoscopy devices. (ERENBERG et al., 1984)

And even so, we have authors who relate malformation of the palate to the use of devices, reporting changes after 70 days of use. (DUKE et al., 1976)

After hospital research PANDOLFI et al., (2003) reports that only 1 baby was diagnosed with pseudomembranous candidiasis, this patient being hospitalized for asphyxia, very low weight, preterm. Agreeing with the statistics of (WALTER et al.,1996).

Other authors report a relationship between candidiasis and preterm newborns due to the immaturity of the defense system of premature infants and those hospitalized in the ICU, with candidiasis being a fungal disease that affects patients with low immunity. (YARED et al., 2001)

CONCLUSION

This literary review reported oral alterations and their consequences, showing the importance of emphasizing such alterations in the health care of premature babies. Enamel changes being the most common in preterm infants, which predispose these children to caries, requiring greater care in tooth hygiene. It is necessary to associate the use of neonatal equipment in hospitals with anatomical deformations in the palate, causing malocclusions. The association of correct feeding due to the baby's months of age, not preventing him from eating correctly due to the late eruption of deciduous teeth. And finally, maintain adequate hygiene of the oral cavity and of the devices used in the neonatal period, to avoid accumulations of microorganism that could spread due to the low immunity state of these premature children.

It is expected that the correct care of preterm infants will take place by professionals, providing adequate management of these children and correct guidance to parents.

In conclusion, the importance of developing child health care to improve neonatal care, encouraging re-education in oral health through this literature review, with the aim of preventing, mitigating possible physical and dental changes of oral alterations in premature babies.

REFERENCES

AGUIAR, S. M. H. C. Á.; PINTO, R. S.. LESÕES CARIOSAS, RESTAURAÇÕES E EXTRAÇÕES POR PROCESSO CARIOSO, DE PRIMEIROS MOLARES PERMANENTES. ESTUDO CLÍNICO E RADIOGRÁFICO.. Revista de Odontologia da UNESP, v. 25, p. 345 - 355, 1996.

AGUIAR, S. M. H. C. A. et al. Alterações dentárias em crianças nascidas prematuras; Revisão de Literatura. Odontopediatr odontol bebê., v. 6, n. 31, p. 240-243, 2003

ALVES C. R. L. Effect of preterm birth on motor development, behavior, and school performance of school-age children: a systematic review. Sociedade Brasileira de Pediatria P.119-134, 2014

Caixeta FF, Corrêa MS. Os defeitos do esmalte e a erupção dentária em crianças prematuras. Rev Assoc Med Bras 2005;51:195-9.

DINIZ, M. B. et al. Alterações orais em crianças prematuras e de baixo peso ao nascer: a importância da relação entre pediatras e odontopediatras. Rev Paul Pediatr., v. 29, n. 3, p. 449-455, 2011.

DRUMMOND B. K. Defects of the primary dentition and prematury. Pediatr Dent. V.14, n.2, p. 119-121, 1992

Duke PM, Coulson JD, Santos JI, Johnson JD. Cleft palate associated with prolonged orotracheal intubation in infancy. J Pediatr 1976;89:990-1.

Erenberg A, Nowak AJ. Palatal groove formation in neonates and infants with orotracheal tubes. Am J Dis Child 1984;138:974-5

HERNANDEZ A. M. Atuação fonoaudiológica em neonatologia: Uma proposta de intervenção Lovise., v.I, n. 3, p. 43-98 1996

Lunardelli SE, Peres MA. Breast-feeding and other mother-child factors associated with developmental enamel defects in the primary teeth of Brazilian

MADI, J. M. et al. Avaliação dos fatores associados à ocorrência de prematuridade em um hospital terciário de ensino. Revista da AMRIGS, Porto Alegre, v. 56, n. 2, p. 111-118, abr./jun. 2012

MUNHOZ L. F. S. Achados fluoscopicos de deglutição: comparação entre recém nascidos pré-termo e recém-nascidos de termo. J. Soc Braz Fonoaudiol., v.23, n. 3, p. 206-213, 2011

NORÉN, J.G. Enamel structure in deciduous teeth from low-birth-weight infants. Acta Odontol Scand, Oslo, v.41, n.6, p.355-362, Dec. 1983.

PANDOLFI, M. et al. Estudos sobre prevalência de alterações bucais em bebês internos em UTI neonatal. Odontol, v. 7, n. 3, p. 6-13, 2005.

QUEIROZ, F. S. et al. Avaliação das condições de saúde bucal de Portadores de Necessidades Especiais. RevOdontol UNESP, v. 43, n. 6, p. 396-401, nov./dez., 2014.

Ramos SR, Gugisch RC, Fraiz FC. The influence of gestational age and birth weight of the newborn on tooth eruption. J Appl Oral Sci 2006;14:228-32

RIBEIRO, C. M. Relação entre doença periodontal em gestantes com parto prematuro e o nascimento de bebês de baixo peso. Revista Saúde e Desenvolvimento, v. 4, n. 2, jul./dez. 2013.

SEOW. W. K. et al. Oral complications of premature birth. Australian Dental Journal, v. 31, p. 1, 1986.

SILVA, C. C. V. Atuação da fisioterapia através da estimulação precoce em bebês prematuros. Rev. Eletrôn. Atualiza Saúde, Salvador, v. 5, n. 5, p. 29-36, jan./jun. 2017.

VASCONCELOS, J. D. A. L. et al. Fatores de risco relacionados à prematuridade ao nascer: um estudo caso-controle. Odonto, v. 20, n. 40, p. 119-127, 2012.

WALTER, L. R. F.; FERELLE, A.; ISSAO, M. Odontologia para o bebê. São Paulo: Artes Médicas, 1996.

WORLD HEALTH ORGANIZATION (WHO). Born too soon: the global action report on preterm birth. The Global action report. World Health Organization. Geneva, 2012. Disponívelem: <http://www.who.int/pmnch/media/news/2012/201204_borntoosoon-report.pdf>. Acesso em: 25 fev. 2017.

YARED, F. N. F. G. et al. Estomatite cremosa ou "sapinho". Avaliação da influência da limpeza bucal na lactente antes da erupção dentária. J. Bras. Odontopediatria Odontol. Bebê, Curitiba, v. 4, n. 18, p. 103-110, mar./abr. 2001.