

Caries Prevalence and Eating Habits in Infants in Southeastern Brazil

Prevalência de Cárie e Hábitos Alimentares em Bebês no Sudeste do Brasil

Prevalencia de Caries y Hábitos Alimentarios en Lactantes del Sudeste de Brasil

Josy dos Santos **DE OLIVEIRA**

School of Dentistry, Federal University of Alfenas (UNIFAL-MG). Alfenas, Minas Gerais, Brazil
<https://orcid.org/0000-0002-6742-2975>

Kellen Cristina da Silva **GASQUE**

Regional Board, Oswaldo Cruz Foundation (FIOCRUZ-DF). Brasília, Distrito Federal, Brazil
<https://orcid.org/0000-0003-2015-2717>

Denismar Alves **NOGUEIRA**

Department of Exact Sciences, Federal University of Alfenas (UNIFAL-MG) Alfenas, Minas Gerais, Brazil
<http://orcid.org/0000-0003-2285-8764>

Lucas Bruzadelli Paulino **DA COSTA**

School of Dentistry, Federal University of Alfenas (UNIFAL-MG). Alfenas, Minas Gerais, Brazil
<https://orcid.org/0000-0001-5236-0110>

François Isnaldo **DIAS CALDEIRA**

School of Dentistry, Federal University of Alfenas (UNIFAL-MG). Alfenas, Minas Gerais, Brazil, Department of Morphology, Genetics, Orthodontics and Pediatric Dentistry. School of Dentistry at Araraquara. São Paulo State University (UNESP). Araraquara, São Paulo, Brazil
<https://orcid.org/0000-0002-4688-2059>

Daniela Coelho de **LIMA**

School of Dentistry, Federal University of Alfenas (UNIFAL-MG). Alfenas, Minas Gerais, Brazil
<http://orcid.org/0000-0002-7945-435X>

Daniela Silva Barroso de **OLIVEIRA**

School of Dentistry, Federal University of Alfenas (UNIFAL-MG). Alfenas, Minas Gerais, Brazil
<http://orcid.org/0000-0003-2691-1411>

Abstract

Introduction: In the last decades, great emphasis has been given to early dental care. Dentistry for Babies has been gaining more and more space within current dentistry, to promote reduction of caries incidence and improvement of collective consciousness, especially of parents or guardians, regarding to oral care, hygiene habits and diet. **Objective:** To evaluate the prevalence of caries in infants aged 13 to 36 months attending a university pediatric dental clinic in Southeastern Brazil and correlate these data with their eating habits. **Methods:** Parents or guardians responded to a semi-structured questionnaire approaching eating habits of these infants and their exposure to foods with cariogenic potential. In addition, the dmf-t index and the risk of caries were evaluated considering alpha of 0.05. **Results:** Mean dmf-t index was 1.25. Most babies presented a high 50% risk for the development of caries disease. The intake of foods with protective potential for dental caries was present in the diet of 93.3% of infants. Despite of that, 73.3% of the infants ate foods with hidden sugar and 53.3% took syrup or suspension medications. Results were statistically different ($p = 0.017$) between infants who received breastfeeding and their dmf-t indexes. **Conclusion:** Majority of infants had inadequate dietary patterns, exaggerated exposure to liquids or foods with cariogenic potential, evidenced by the elevated dmf-t index. Also, breastfeeding was correlated to higher risks to develop dental caries.

Descriptors: Pediatric Dentistry; Dental Caries; Feeding Behavior; Breast Feeding.

Resumo

Introdução: Nas últimas décadas, grande ênfase tem sido dada aos cuidados dentários precoces. A odontologia para bebês vem ganhando cada vez mais espaço dentro da odontologia atual, para promover a redução da incidência de cárie e a melhoria da consciência coletiva, especialmente dos pais ou responsáveis, no que diz respeito aos cuidados bucais, hábitos de higiene e dieta. **Objetivo:** Avaliar a prevalência de cárie em bebês de 13 a 36 meses de idade que frequentava uma clínica odontológica pediátrica universitária no Sudeste do Brasil e correlacionar estes dados com seus hábitos alimentares. **Métodos:** Os pais ou responsáveis responderam a um questionário semi-estruturado abordando os hábitos alimentares desses bebês e sua exposição a alimentos com potencial cariogênico. Além disso, o índice dmf-t e o risco de cárie foram avaliados considerando alfa de 0,05. **Resultados:** O índice médio de dmf-t foi de 1,25. A maioria dos bebês apresentou um alto risco de 50% para o desenvolvimento de doenças cariogênicas. A ingestão de alimentos com potencial de proteção para cárie dentária estava presente na dieta de 93,3% dos bebês. Apesar disso, 73,3% dos bebês comiam alimentos com açúcar escondido e 53,3% tomavam xarope ou medicamentos em suspensão. Os resultados foram estatisticamente diferentes ($p = 0,017$) entre os bebês que receberam amamentação e seus índices de dmf-t. **Conclusão:** A maioria dos bebês tinha padrões alimentares inadequados, exposição exagerada a líquidos ou alimentos com potencial cariogênico, evidenciado pelo elevado índice dmf-t. Além disso, a amamentação estava correlacionada a maiores riscos para o desenvolvimento de cárie dentária.

Descritores: Odontopediatria; Cárie Dentária; Comportamento Alimentar; Aleitamento Materno.

Resumen

Introducción: En las últimas décadas, se ha dado un gran énfasis al cuidado dental temprano. La odontología para bebés ha ido ganando cada vez más espacio dentro de la odontología actual, para promover la reducción de la incidencia de la caries y la mejora de la conciencia colectiva, especialmente de los padres o tutores, en relación con el cuidado bucal, los hábitos de higiene y la dieta. **Objetivo:** Evaluar la prevalencia de caries en lactantes de 13 a 36 meses que acuden a una clínica odontológica pediátrica universitaria del sudeste de Brasil y correlacionar estos datos con sus hábitos alimentarios. **Métodos:** Los padres o tutores respondieron a un cuestionario semiestructurado que abordaba los hábitos alimentarios de estos lactantes y su exposición a alimentos con potencial cariogénico. Además, se evaluó el índice dmf-t y el riesgo de caries considerando el alfa de 0,05. **Resultados:** La media del índice dmf-t fue de 1,25. La mayoría de los bebés presentaron un riesgo elevado del 50% para el desarrollo de la enfermedad de la caries. La ingesta de alimentos con potencial protector de la caries dental estaba presente en la dieta del 93,3% de los lactantes. A pesar de ello, el 73,3% de los lactantes consumía alimentos con azúcar oculto y el 53,3% tomaba medicamentos en forma de jarabe o suspensión. Los resultados fueron estadísticamente diferentes ($p = 0,017$) entre los lactantes que recibieron lactancia materna y sus índices dmf-t. **Conclusiones:** La mayoría de los lactantes presentaban patrones dietéticos inadecuados, exposición exagerada a líquidos o alimentos con potencial cariogénico, evidenciado por el elevado índice dmf-t. Además, la lactancia materna se correlacionó con un mayor riesgo de desarrollar caries dental.

Descritores: Odontología Pediátrica; Caries Dental; Conducta Alimentaria; Lactancia Materna.

INTRODUCTION

In the last decades, great emphasis has been given to early dental care. Dentistry for Babies has been gaining more and more space within current dentistry, to promote reduction of caries incidence and improvement of collective consciousness, especially of parents or

guardians, regarding to oral care, hygiene habits and diet¹.

The prevalence of caries in early childhood is still extremely high, since during this period there is a high frequency of sucrose consumption, associated with the absence of oral hygiene methods, which makes caries

disease a public health problem². These observations, among others, have led the researchers to indicate the dental care to this clientele, since caries can be prevented and controlled. However, to allow caries prevention to be established, it is necessary to know its etiology and the risk factors associated to its development^{3,4}. Caries is a multifactorial disease and a dynamic process is required for its development, which depends on an interaction between innumerable factors for its initiation and progression³. Sugar consumption is one of these factors and, for this reason, it is clear the importance of children's eating habits in the process of disease development⁵. Risk factors for dental caries are related directly or indirectly to the mother, since she determines and introduces the first habits of oral hygiene and feeding to the baby^{3,5,6}. The addition of sugar to the diet increases the activity of caries, especially when consumed between meals and in consistency that favors its retention for a long period of time in the mouth, providing a high frequency of the carbohydrate available in the buccal cavity⁷. Thus, the association between sucrose intake and other cariogenic foods with prevalence of caries disease is significant^{3,4,7}.

The nocturnal breastfeeding habit significantly increases the cariogenic challenge, since the liquid content becomes stagnant on the mouth due to the decrease of the sucking speed and the salivary secretion^{2,5}. This allows carbohydrates to remain in contact with the teeth in the presence of microorganisms for hours, favoring the development of the cariogenic process. This prolonged habit is the main etiological factor of severe caries in childhood. Therefore, there is a positive relationship between nocturnal diet intake and caries frequency in infants⁴⁻⁷.

When a child become ill, their caregivers become less demanding regarding to dietary control, oral hygiene and there is an intensified use of medications containing sucrose (in liquid form or chewable tablet), with repeated administrations including in the sleep period, thus increasing caries susceptibility. Parents routinely blame the occurrence of dental problems of their children on antibiotic composition, however, no correlation has been found¹⁻⁷.

Preventive programs aimed at reducing the incidence of caries in infancy can be improved if the feeding practices (including breastfeeding) are well known and risk for the future occurrence of severe caries in infancy have been evaluated. Then, the aim of this study was to evaluate the prevalence of caries in 13 to

36-month-old infants treated in the Pediatric Dentistry Clinic of the Federal University of Alfenas (UNIFAL-MG) and to correlate these data to the eating habits of the infants.

MATERIAL AND METHOD

This study followed the guidelines of STROBE Statement (Strengthening the Reporting of Observational studies in Epidemiology).⁸

o Ethical Approval

This study followed the guidelines of the Ethics Committee on Research Involving Human Beings of the Federal University of Alfenas-Minas Gerais (UNIFAL-MG), under the registration number 23087.004129/2008-45. All mothers or guardians responsible for infants agreed with the terms of the research and signed the Informed Consent Term.

o Study Location and Sample

Alfenas city is locate in Minas Gerais state, in the southeast region of Brazil, having a population of 79,996 inhabitants, with a total area of 850,446 km². Its demographic density is 84.75 (inhabitants/km²), Human Development Index (HDI) is 0.761, with its population living mainly in the urban perimeter⁹.

In this cross-sectional study, a convenience sample was obtained and mothers or guardians responsible for infants (ages between 13 to 36 months) were interviewed (n=30).

o Calibration of Researchers

Two undergraduate dental students (J.S.O and L.B.P.C) were previously trained and calibrated. For calibration, a semi-structured questionnaire was applied in different periods with the same mother or caregiver in the Pediatric Dentistry Clinic and the clinical examination was performed by previously trained researchers (Kappa: J.S.O= 0.88 to 0.91), and L.B.P.C= 0.87 to 0.90).

o Anamnesis and clinical examination

A semi-structured questionnaire was prepared consisting of 12 questions that evaluated infant's eating habits. Second stage consisted of an examination that was performed after professional prophylaxis and under artificial lighting to determine the risk of dental caries, classified as low, medium and high risk according to the criteria described by Tagliafero et al., 2008. And in the last stage, the dmft index (primary teeth decayed, extracted and obturated) was determined using the criteria of Brazil 2010 Oral Health (Brasil, 2012)^{10,11}.

o Statistical analysis

T tests were performed by the statistical program SPSS for Windows (Version 22; IBM

Corp., Chicago, IL, USA), correlating demographic factors, risks for caries, and infant's eating habits

RESULTS

A total of 30 children (13-36 months old) participated in the present study. They belonged to both genders (46.7% boys and 53.3% girls) and were from mixed social backgrounds. Only 43.3% of parents or guardians answered positively when they were asked about breastfeeding, and among them, 30% used to breastfeed at night. There was a statistical difference ($p = 0.017$) between the number of infants who received breastfeeding and the dmf-t index.

Breast and bottle feedings frequencies are shown in Figure 1. More than 56% of the children were fed in the bottle and, of these, 13.3% were fed at dawn. In addition, the majority of respondents (66.7%) said that they used to add some type of substance to the babies' milk (chocolate =39%; sugar= 25%). In addition to milk, 53.3% of infants were taking sweetened liquids.

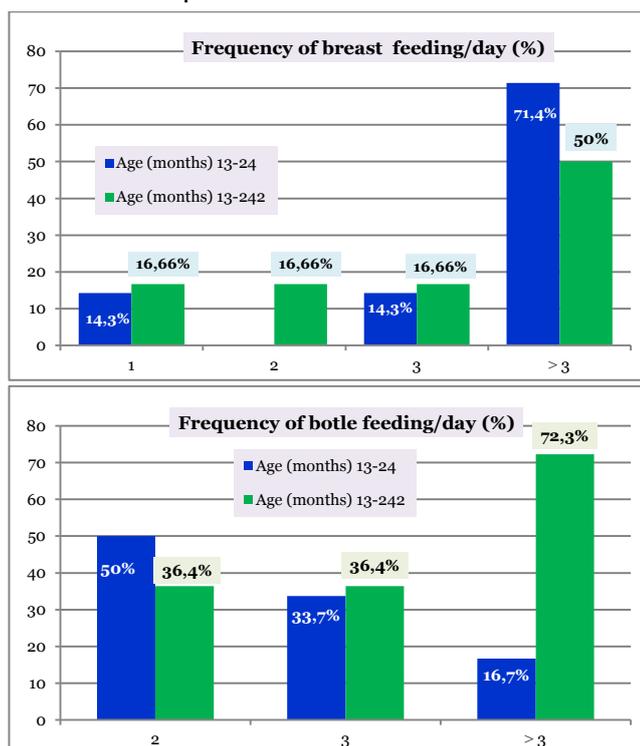


Figure 1. Frequencies of Breast and Bottle feeding per day (values are expressed in percentage).

Most babies consumed treats during the day and, also, the greater the age of the child the greater the frequency of ingestion of cariogenic foods. The intake of foods with protective potential for dental caries was present in the diet of 93.3% of infants. Despite of that, 73.3% of the infants ate foods with hidden sugar and 53.3% took syrup or suspension medications.

The mean dmf-t index was 1.25. Most babies presented a high (50%) or low (46.6%) risk for the development of caries disease.

DISCUSSION

Exclusive Breastfeeding is recommended until the child reaches 6 months old. From this age on, child may receive other foods gradually, while maintaining breastfeeding for at least 2 years¹². Breastfeeding was present in 43.3% of the infants surveyed and there was a statistically significant difference ($p = 0.017$) between the babies who were breastfed and the dmf-t, indicating that breastfeeding may be a risk factor. Cariogenicity of breastfeeding has been reported before, although some other studies have shown a protective role against dental caries^{13,14}. Some authors have also shown that breastfeeding alone does not increase the risk of caries in children. However, the high frequency of breastfeeding in the first year of life of infants had a direct influence on the increased risk of early-onset caries^{13,15}.

Only 30% of the respondents said they practiced nocturnal breastfeeding, similarly to other studies. The importance of this habit for the evolution of caries disease relies on the fact that when the child is fed shortly before falling asleep, oral hygiene is neglected¹⁶. Bottle feeding reached 56.7% of the children and, of these, 13.3% have nocturnal breastfeeding and consequently were more exposed to decreased salivary flow and stagnation of fermentable carbohydrates, resulting in a highly cariogenic environment^{17,18}. During suckling, sucking is rapid, but as the child goes to sleep, deglutition will subside, as will the salivary flow. This allows the milk to stay in contact with the teeth for a long time in the sleep period, becoming an aggravating factor for the onset of caries¹⁹. A devastating risk of breastfeeding and bottle-feeding caries, related to prolonged and repetitive feeding, without proper oral hygiene, have been reported, demanding that parents are instructed to provide their child with the correct preventive measures^{13,14}. For this reason, American Academy of Pediatric Dentistry asks dentists to take responsibility for guiding parents and guardians to eliminate the existing knowledge gaps that may result in dental caries of the infants²⁰. Similar position has been stated by the American Dental Association²¹ and British Society of Paediatric Dentistry²².

The majority of respondents (66.70%) reported that they add chocolate (39%) and sugar (25%) among others, in babies' milk. Considering this, it is possibly to postulate that the pattern of frequent demineralization in cavities from bottle fed children is a result of the

addition of sugars to milk and the nocturnal habit. High frequency of sweetened liquids in the bottle is common. Mother offers sweet foods since these are easier to be accepted, and so, reassures herself to her child. However, the ingestion of sugary juices, especially when there is a high proportion of sorbitol, fructose and glucose, increases the risk of caries disease in infants^{23,24}. It was evidenced in our study that 53.3% of the babies were taking sweet liquids other than milk.

Majority of the babies consumed treats during the day and also, the greater the age of the child, the greater the frequency of ingestion of cariogenic foods. Agreeing, it was previously shown that the consumption of sweet foods was a habit positively correlated with the occurrence of caries ($p = 0.012$), and 32.05% of the children who consumed such foods had the disease²⁵.

Phosphate, among other chemicals, has been associated to inhibition of caries activity, also known as protectors. Cheese is an example of a protective food and its various constituents can have a direct local effect on dental surfaces, such as phosphoproteins (casein) that bind to hydroxyapatite, reducing its solubility and inhibiting bacteria adhesion²⁵. We have found that the majority (93.3%) of the babies presented food intake of such protectors.

A total of 73,3% of the babies consumed foods with hidden sugars. Sucrose has always been considered the most cariogenic disaccharide, always present in the family diet, and being a component of products such as ketchup, mustard, spices, milk products, processed juices, dried fruits, soft drinks and chips²⁶. Syrup or suspension type drugs were ingested by 53.3% of the babies and a strong relationship between the long-term use of drugs and the occurrence of severe caries in early childhood have been reported, both because the drugs were sweetened and the teeth were not properly cleaned, which is usually occurs during problems of child general health²⁷.

Mean dmft score for babies with 13 to 36 months was 1.25 which is an alarming result, if we consider the SB 2000¹⁰, where we found that, on average, a Brazilian child aged 3 years or less already possesses at least one tooth with dental caries experience and a mean dmft of 1.1. Other authors have also found overall dmft index above the expected for the same age group^{28,29}. Although higher than the SB 2000 analysis, our results are positive when compared to older results.

In addition to the dmft index, the risk of caries was also evaluated, and most of the infants presented a high (50%) or a low (47%)

risk. These data evidenced that the parents or guardians demanded dental treatment before the onset of the disease or in a very advanced stage of its evolution, making it difficult to control and intercept the etiological factors of caries. Often, the demand for dental services only occurs in cases of pain, changes in sleep and feeding of the child, or when the pediatrician requests a visit to the dental surgeon. For this reason, mothers and guardians should be advised of how important is to have a regular calendar of dental visit, as well as the recognition of early signs of caries, adequate nutrition, supervised dental brushing and the cautious use of fluoride sources, since mothers have a positive influence on the eating habits of their children¹.

Number of mothers or caretakers interviewed and the number of babies is a partial limitation of this study. Geographical location and number of inhabitants was the main reason for the reduction of the sample. These limitations can be considered partial because they allowed us to analyze data properly.

CONCLUSION

Thus, inappropriate dietary patterns, exaggerated exposure of babies to liquids or foods with cariogenic potential are correlated with the high dmft index found and with the higher risks of caries of the infants participating of this study.

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interests.

CORRESPONDING AUTHOR

François Isnaldo Dias Caldeira

Department of Morphology, Genetics, Orthodontics and
Pediatric Dentistry

School of Dentistry at Araraquara.

São Paulo State University (UNESP).

Araraquara, São Paulo, Brazil.

fraqncoisdias@hotmail.com

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