

PREVALENCE OF DENTAL CARIES IN 3- AND 5-YEAR-OLD CHILDREN LIVING IN A SMALL BRAZILIAN CITY

PREVALÊNCIA DA CÁRIE DENTÁRIA EM CRIANÇAS DE 3 E 5 ANOS RESIDENTES EM UM MUNICÍPIO BRASILEIRO DE PEQUENO PORTE

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Despite the reduction in the prevalence of dental caries, very little is known about the prevalence of the disease, especially in deciduous teeth, in small Brazilian cities (<20,000 inhabitants). The aim of this study was to evaluate the prevalence of dental caries in children aged 3 and 5 years of age in the city of Cambira – State of Parana. All children that participated in the national vaccination campaign against poliomyelitis in 2002 at the two basic health units of the city were examined. The campaign covered 99.5% of the population aged 1 to 5 years. Two previously trained and calibrated dentists performed the clinical examinations after the children brushed their teeth and recorded their caries experience by means of the dmf index. The results showed that there was no statistically significant difference in the prevalence of the disease between the male and female genders and between the rural and urban zones. At the age of 3, 68.50% of the children were caries-free, compared to 31.10% at the age of 5. In the total population, 11.19% of the children accounted for 50.86% of the teeth affected by dental caries. The dmf index at 3 and 5 years in the study population was 2.10 and 3.51, respectively. These data showed that the city has not yet reached the goals proposed by the WHO for the year 2000, what indicates the need for greater investment in programs aimed to prevention and control of the disease.

UNITERMS: Dental caries; Deciduous tooth; Child.

INTRODUCTION

This study was conducted considering the lack of recent studies addressing the prevention of dental caries in deciduous teeth¹. Studies have reported a wide range in prevalence of dental caries at 3 and 5 years of age. Vigild, et al.¹⁷, in a study carried out in Kuwait, showed that the prevalence of the disease in infancy is severe, as at 4 and 6 years of age, the number of caries-free children was 19.00% and 9.00% respectively, and among affected children aged 4, 47.00% of the lesions were located in the maxillary anterior

teeth, compared to 52.00% at 6 years old. In Thailand, Kanchanakamol, et al.⁷ found that the prevalence of the disease in children aged 13 to 24 months old, 25 to 36 months old and 37 to 48 months was 9.40%, 36.50% and 50.40% respectively, and the dmf index was 0.30, 1.40 and 1.70 for the age groups studied. In Japan, Yonezu and Machida¹⁹ found a prevalence of 31.80% at the age of 3. Data from the African continent showed that the percentage of South African children affected by dental caries at the ages of 3, 4 and 5 is 47.00%, 58.00% and 63.00% respectively⁸. Petti, et al.¹³ reported that the prevalence of the disease in Roman

children at 3 years of age is 26.5%, at 4 years of age 27.1% and at 5 it is 29.3%; the mean dmf found was 1.1. Recently, Albert, et al.¹ observed children aged 3 to 4 years that lived below the North American poverty level and found that 66.0% were free of caries, the mean dmf was 1.08, and when the caries-free children were excluded from the calculation the value was 3.14.

In Brazil, few studies have been dedicated to the subject in the last few years. Martins, et al.⁹ analyzed the clinical records of children assisted at the Barragem Santa Luzia dental clinic, located in a slum in the Southern zone of the metropolitan region of Belo Horizonte, and found that only 5.26% of the children between 3 and 5 years of age were caries-free. On the other hand, Borges and Toledo³ evaluated a preventive oral health program in children from 0 to 5 years old, conducted for a 5-year period in the city of Ceilandia, and found that at 3 and 5 years of age, 81.90% and 72.30% of the children were free of caries, respectively. Santos and Soviero¹⁴ described that, 41.60% of the children above 3 years of age registered at the pediatric outpatients of the Pedro Ernesto University Hospital, in the city of Rio de Janeiro, were affected by the disease. Ferreira, et al.⁵ showed that the prevalence of dental caries in the deciduous teeth of children aged 0 to 6 years of age enrolled in the Infant Education Schools in the city of Canoas-RS (Rio Grande do Sul State) is 40.40% and the dmf index is 1.06.

Most studies available in the literature on the prevalence of dental caries in deciduous teeth of Brazilian children were carried out in medium to large sized cities; that is to say, cities with over 20,000 inhabitants. The aim of this study was to evaluate the prevalence of dental caries in children of 3 and 5 years of age, in a small sized Brazilian city.

MATERIAL AND METHOD

The study was carried out at the city of Cambira, located in the north of the State of Parana, the main economic activity of which is cattle raising. The population is 6,661 inhabitants, with 4,164 inhabitants living in the urban zone and 2,497 inhabitants in the rural zone. According to the Brazilian Institute of National Statistics and Geography (IBGE), the city may be considered as small when it has less than 20,000 inhabitants⁶.

Water is supplied by the Parana Water Supply Company to 90.00% of the urban population and 30.00% of those

living in the rural area. According to information provided by the company, the water fluoridation system was implemented in 1984 and the fluoride concentration ranges from 0.60 to 0.80 ppmF.

All children aged 3 to 5 years living in the city of Cambira who participated in the national vaccination against poliomyelitis campaign on June 15th, 2002, were examined.

Clinical examinations were performed by two examiners trained and calibrated for the dmf index, according to the diagnostic criteria described by the World Health Organization (WHO)¹². Intra- and interexaminer agreement for dental caries diagnosis was evaluated by means of the Kappa coefficient, showing values of 0.96 and 0.94, respectively, meaning an almost perfect agreement.

The oral examination was performed in the dental consulting rooms of the two Basic Health Units of the city, one located in the urban and the other in the rural zone. The teeth were dried with an air syringe and examined under artificial light using a clinical mirror and exploratory probe only for removing debris. Before clinical examination, the child's oral hygiene was performed by means of toothbrushing.

The data obtained were recorded on a form especially drawn up for this study. Statistical analysis was done by the Epi Info 6.04b program and the chi square test (χ^2) was applied at a significance level of 0.05 and confidence interval of 95.00%.

The Project was submitted to the Ethics Committee and received a favorable report. Authorization was obtained from the city health service, and the parents or caretakers were informed on the aims of this study at the day of examination before any procedure was carried out, and the child was included in the study after written authorization. The cases with more urgent treatment needs were referred for dental treatment at the Basic Health Unit.

RESULTS

Examinations were carried out in 134 children, 73 aged 3 and 61 aged 5. There were 42 children living in the rural zone and 92 in the urban zone, being 72 girls and 62 boys (Table 1).

No statistically significant differences were found in the study population as to the prevalence of the disease between the female and male genders at 3 and 5 years of age. As

TABLE 1- Distribution of the children in relation to gender, age and area of residence. Cambira, PR, 2002

GENDER	RURAL		URBAN		TOTAL
	3 years	5 years	3 years	5 years	
Female	12 (8.96%)	8 (5.97%)	26 (19.40%)	26 (19.40%)	72 (57.73%)
Male	10 (7.46%)	12 (8.96%)	25 (18.66%)	15 (11.19%)	62 (46.27%)
TOTAL	22 (16.42%)	20 (14.93%)	51 (38.06%)	41 (30.59%)	134 (100.00%)

regards the area of residence, no statistically significant difference was also found, although the percentage of children affected by dental caries at 3 years of age living in the rural zone was 45.45%, compared to 25.49% for those at the same age living in the urban zone. The total number of caries-free children in the rural and urban zones was 45.24% and 54.35%, respectively.

Figure 1 shows that 68.50% were free of caries at 3 years of age, while only 31.14% were caries-free at 5 years. The number of children who had more than 3 carious lesions at 3 and 5 years of age was 16.43% and 34.42%, respectively. The dmf index at 5 years was 1.67 times greater than at 3 years, and the number of teeth indicated for extraction at 5 years was practically twice as much as the number at 3 years of age (Table 2). The mean dmf found when caries-free children were excluded from the calculation was 5.65 (± 4.83).

Among the 3-year-old children, 8 (10.96%) had dmf equal to or greater than 10 and accounted for 50.72% of the lesions found. In the 5-year-old age group, 7 (11.47%) children that had dmf equal to or greater than 10 accounted for 42.06% of the teeth affected by dental caries. In general, the 15 children, (11.19%) that had dmf equal to or greater than 10 accounted for 50.86% of the carious teeth found in this investigation. At 3 years of age, 14 (19.17%) children had caries in at least one maxillary incisor tooth, compared to 19 (31.14%) in the 5-year-old group. The teeth most affected by dental caries at 3 years were the maxillary central incisors, and the mandibular second molars at the age of 5.

DISCUSSION

Although the small cities represent 77.72% of Brazilian cities, and those with less than 10,000 inhabitants account for 49.30%, only 8.60% of the Brazilian population is

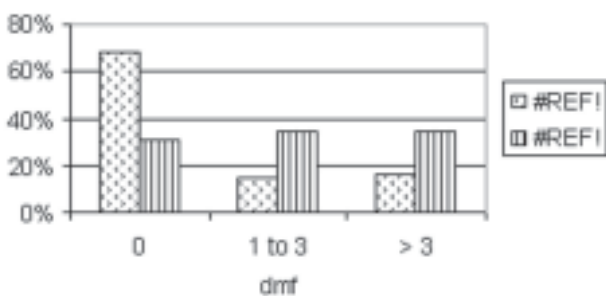


FIGURE 1- Percentage distribution of the dmf index according to the ages in the city of Cambira, PR, 2002

concentrated in them. Most Brazilian studies on dental caries in deciduous teeth were carried out in cities with a much higher number of inhabitants^{3,5,9,10,14,16}. In smaller cities, the offer of health services, the existence of programs for oral health promotion, as well as the generalized access to fluoridated water are not equal to larger municipalities. Regional variations and differences between the rural and urban populations can be seldom detected when only urban populations of larger municipalities are appraised¹¹.

Even though the prevalence of dental caries has declined over the last few decades, mainly as the result of using fluoride, there is still a long way to go in eliminating the disease in the whole population¹⁸. In this study, the prevalence of dental caries was greater than that established as a goal by the WHO for the year 2000⁴, since only 31.14% of the children at 5 years of age were caries-free.

As observed in other studies^{2,3,5,7,14,19} the number of children affected by the disease increased with age, being the percentage of children with dmf > 0 at 5 years old almost 2 times greater than at 3 years. A similar increase in the disease was observed in Brazil by Morita, et al.¹⁰ and Tomita, et al.¹⁶, and in South Africa by Khan and Cleanton-Jones⁸.

In the city investigated, the public dental service system for children under the age of 5 was implemented in 1999 and the population's access to the service is still not satisfactory, what may be noticed by the small number of restored teeth in relation to the carious teeth, and by the number of teeth indicated for extraction at 3 and 5 years.

At 3 years of age, the maxillary incisors were the most affected by the disease, with 19.17% of the children having at least one carious lesion in one such tooth. The result obtained corroborates the findings of Vigild, et al.¹⁷ in Kuwait and of Santos and Sovieiro¹⁴ in Brazil.

In the same way as reported by Tomita, et al.¹⁶, Sasahara, et al.¹⁵ and Ferreira, et al.⁵, there was no statistically significant differences in the study population as to the prevalence of the disease between the female and male genders at 3 and 5 years of age. Although no statistically significant difference was detected in the prevalence of the disease between children living in the urban and rural zones, it is important to record that, at 3 years of age, 45.45% of the children residing in the rural zone had caries, while this percentage in the urban zone was only 25.49%. Even though the number of children examined in the rural area was small (n=47) to allow comparisons, the access to fluoridated water in the rural zone (30.00%) compared to the urban area (90.00%) may be the origin of the difference observed.

The decline in dental caries observed in developing countries was not homogenous. A similar fact was found in

TABLE 2- Mean of the components of the dmf index according to age. Cambira, PR, 2002

AGE	n	d	m	f	dmf
3 YEARS	73	1.51	0.40	0.19	2.10(+4.36)
5 YEARS	61	2.31	0.79	0.41	3.51(+4.34)
TOTAL	134	1.87	0.57	0.29	2.74(+4.39)

the study population, as the 15 children (11.19%) that had dmf > 10 accounted for 50.86% of the teeth affected by dental caries found in this investigation. This observation stratifies the presence of an outstanding number of carious lesions in some children. It is still not possible to mention polarization of the disease, since about 49.00% of the study population had caries, yet the unequal distribution of the disease shows the need to identify and give priority to some children when they come to dental treatment.

CONCLUSION

The percentage of caries-free children at 5 years of age is 2 times lower than that at 3 years. The city has still not reached the goal of 50% caries-free children at 5 years proposed by the WHO for the year 2000. The oral health promotion since the first years of life and the expansion of water fluoridation to the whole population in the future may have a great impact on the dmf values found.

RESUMO

Apesar do declínio da prevalência da cárie dentária, muito pouco se conhece sobre a prevalência da doença, especialmente na dentadura decídua, em municípios brasileiros de pequeno porte (< 20.000 habitantes). Este estudo teve por objetivo avaliar a prevalência da doença, em crianças de 3 e 5 anos de idade, do município de Cambira – PR. Foram examinadas todas as crianças que participaram da campanha nacional de vacinação contra poliomielite em 2002 nas duas unidades básicas de saúde do município. A cobertura da campanha foi de 99,5% na população de 1 a 5 anos. Dois cirurgiões dentistas previamente treinados e calibrados realizaram os exames clínicos após a escovação dentária das crianças e registraram a experiência de cárie através do índice ceo. Os resultados mostraram não haver diferença estatisticamente significativa na prevalência da doença nos gêneros masculino e feminino e entre zona rural e urbana. Aos 3 anos, 68,50% das crianças estavam livres de cárie e 31,10% aos 5 anos de idade. Na população total, 11,19% das crianças apresentavam 50,86% dos dentes cariados encontrados. O índice ceo, aos 3 e 5 anos na população estudada foi, respectivamente 2,10 e 3,51. Estes dados mostram que o município ainda não atingiu as metas propostas pela O.M.S. para o ano 2.000, o que indica a necessidade de um maior investimento nos programas destinados à prevenção e controle da doença.

UNITERMOS: Cárie dentária; Dentes decíduos; Crianças.

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