

Original article



CARIES PREVALENCE AMONG 5-7 – YEAR-OLD CHILDREN IN NORTHEAST BULGARIA

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ABSTRACT:

The aim of the current epidemiological research is to present the caries prevalence in children and on tooth surfaces in 5-7 – year-olds from Varna. The object of the current epidemiological research is a representative part of 100 5-7 – year-old children, randomly chosen. The unit of observation is temporary and early mixed dentition, primary molars and their occlusal and approximal surfaces. The survey was carried out according to WHO's criteria. For caries risk assessment it is used the ICDAS system, where for a diagnostic limit was chosen d3mft. As a result from the conducted epidemiological research it is concluded that in this age group 93% of the children have experience with caries and barely 7% are caries free (dmft/DMF(T+t)=0). The intensity d₁₋₃mft and D₁₋₃MF(T+t) of the caries have an average value of 5,76 ± 2,9. The relative share of the approximal caries of the primary molars on maxilla and mandible is 81,5% for both. The relative share of the occlusal caries is 19,6%. In the current research, it is not established statistically significant difference (P>0,05) concerning approximal lesions on first and second primary molar. There is the statistically significant difference (P<0,05) in the relative share of occlusal caries, which mainly affects the occlusal surface on the second primary molar. The relative share of the children without occlusal caries on primary molar is 60%, while those without approximal caries is barely 18%.

Keywords: caries prevalence, distribution of caries among children, epidemiologic research for occlusal and approximal caries

INTRODUCTION:

Dental caries and its complications are more likely to become a significant medical problem for the children. Nowadays, when the dental health of the children and adolescences is a quite substantial challenge in Bulgaria, is established [1] that a significant part of them have experience with this disease on primary molars with its specific characteristics. The serious complications with inflam-

matory and dysfunctional nature, the reflection on the child's common health, the orthodontic problems, the high risk of the future pathology of the oral cavity, imposes the need of very comprehensive and thoroughly research of the carious pathology. These problems also require the usage of complex prophylaxis measures, as well as actively treatment of the affected children.

In the United States of America around 50% of the 5-9-year-old children have at least one caries or restoration, and this proportion increases to 78% at 17-year-olds [2].

In 2004-2005 are clinically examined 349 children in 2-6 years of age in Northwest parts of Canada [3]. The dental caries is a predominant health problem among these children in pre-school age. It is known that 66% (230/349 children) have experience with the disease and mean 4,8 affected teeth, 2,4 of them remain untreated. Twelve percent (42/349) of the children need urgent dental help.

The proportion of 5-year-olds in England where it is not observed clinically obvious caries is 75,2% [4]. The rest 24,7% have one or more carious teeth – diagnostic limit d3mft, as well as teeth restored or extracted due to carious process. The mean value of d3mft is 0,8 as the index varies from 0,6 to 2,5.

During the oral status examination of 7-year-olds in Belgium [5] in the period between 1996-2001 depending on the social status of their parents the following values of dmft and dmfs are received – children with high socio-economic status 1,3/2,7 and three times higher values of these indexes in children with low socio-economic status 3,9/9,1. The frequency of the caries free children is 2,5 times higher among families with high socio-economic status compared with those with low socio-economic status [5].

Another similar epidemiological research in Italy published in 2016 [6], shows that 56,6% of 5-year-olds have caries free temporary dentition and the average value of dmft is 1.44 ± 2.13.

In Greece [7] during 2012 is published epidemiological research of the caries disease in 1209 children with age of 5 years. For diagnostic limit criteria, d3mft is cho-

sen. Dental caries varies much between the different regions, as its mean value is 1,77. 64% of 5-year-olds do not have experience with dentin caries.

According to Prof. Peneva [8] in Bulgaria 6-year old children have an average of 6 deep carious lesions and also four initial. The affected teeth are 34%. More than 80% of the children have caries at this age – 9% have caries in their permanent teeth, despite their fresh eruption, and 88% of the children have caries on the temporary teeth. Almost 50% of the temporary teeth are affected by caries, and the permanent ones – 30% [8]. During 2010 in Bulgaria another epidemiologic research for caries prevalence was carried out in 3 age groups. The results show the following: The data of the caries prevalence demonstrate much higher values than the WHO's global aim. The relative share of caries-free children of 5-6 years (dmft=0) is only 28,87%. With age, this relative share of caries-free children decreases. In all age groups, the values of the indexes are higher in village regions compared to those in cities. The analysis of the data for dmft separated in regions shows dramatic differences: from 2,21 in Pleven region up to 6,66 in Smolyan region. The average value of dmft index for the whole country is 3,69 [1].

The described data gave us the reason to do a more comprehensive and thorough research regarding the epidemiology of the caries disease on the primary teeth as well as the relation between approximal and occlusal caries on the primary molars.

The aim of the current epidemiological research is to present the caries prevalence in children and on tooth surfaces in 5-7 – year-olds from Varna.

MATERIAL AND METHODS:

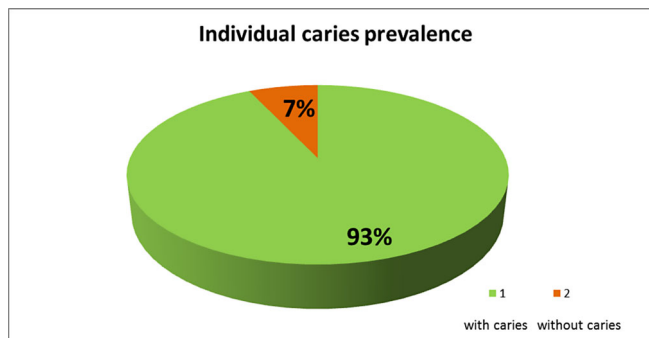
The object of the current epidemiological research is a representative part of 100 5-7 – year-old children, randomly chosen. The unit of observation is temporary and early mixed dentition, primary molars and their occlusal and approximal surfaces. The survey was carried out according to WHO's criteria. For caries assessment ICDAS system is used, as for a diagnostic limit, d_{3mft} is chosen. For analysis and data interpretation, received from the epidemiologic research, are used parametric and nonparametric statistic methods. After data revision and determining the main accents an essential research is performed by data process with mathematical-statistic software SPSS v 20.0

RESULTS AND DISCUSSION:

As a result of the conducted epidemiologic research among 100 children in Varna (31 - 5 years, 39 – 6 years and 30 – 7 years) it is clear that 93% of this group are affected by caries. The caries distribution is quite high as the children who are caries free are barely 7% (dmft=0) (fig. 1). These results are significantly higher compared to those published by other authors [2, 9, 10]. A significant difference is also observed in caries distribution in 5-year-old children in England (75,2% - caries free, 24,7% affected by caries) [4]. In Norway caries, free children at 5 years of age are 48%-52,5%, while the immigrant caries free chil-

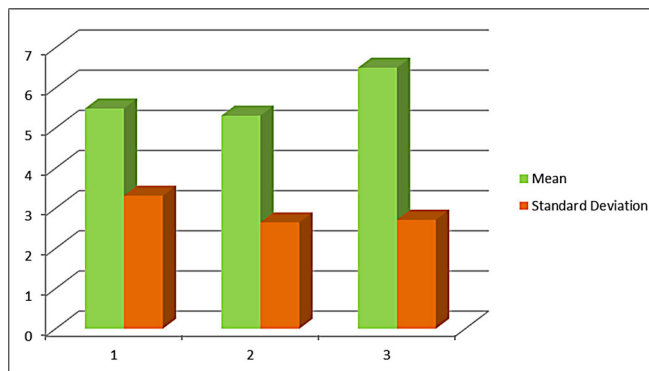
dren at the same age are barely 11,4% [11].

Fig. 1. Individual distribution of caries in 5-7 – year-old children. Children with/without caries.



The intensity - d_{1-3mft} and $D_{1-3MF}(T+t)$ of the carious process in this age group has an average value of $5,76 \pm 2,9$. The intensity for 5 years old children is $5,48 \pm 3,32$, for 6 – year-olds – $5,31 \pm 2,65$, for 7 – year-olds is $6,5 \pm 2,71$ (fig. 2). These results are not significantly higher compared to the those reported by Andreeva [9]. She reports DMF(T+t) index 4,17, as for the city regions it is 3,25 and for the village regions - 5,08. The data received from the current research is close to those presented by the National Epidemiological research in Bulgaria in 2010, as well as other local and foreign surveys [2, 4, 10, 12, 13, 14].

Fig. 2. Caries intensity for 5 years old (1), 6 years old (2) and 7 years old (3) children.

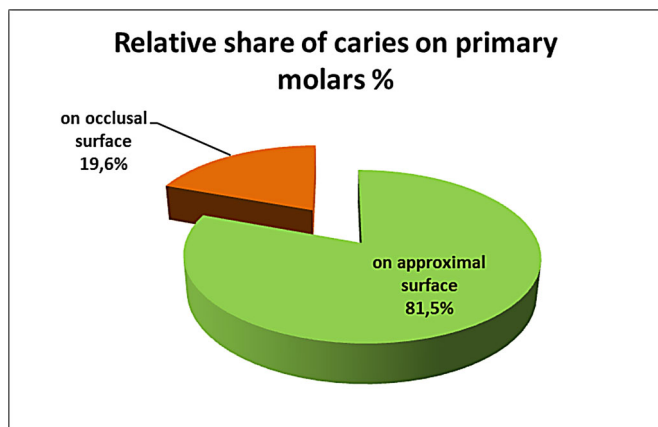


From the examined 100 children at 5-7 years, in the current epidemiological survey is reported, that the relative share of the approximal lesions on primary molars for maxilla and mandible is 81,5% for both. The relative share of the occlusal caries is 19,6% (Fig. 3). This fact opposes to other data from the literature concerning caries distribution on primary molars, which report that the most affected surface is the occlusal one of the second primary molar. Some authors declare 52% distribution of occlusal caries on primary molars [15, 16, 17]. In Norway, 40% of the children at 5 years have approximal caries and 76,2% occlusal [11]. Corrãa-Faria, Paixão-Gonçalvesetal. [18] have established 47,5% to 88% primary molars affected by caries.

In the current survey, it is not established statisti-

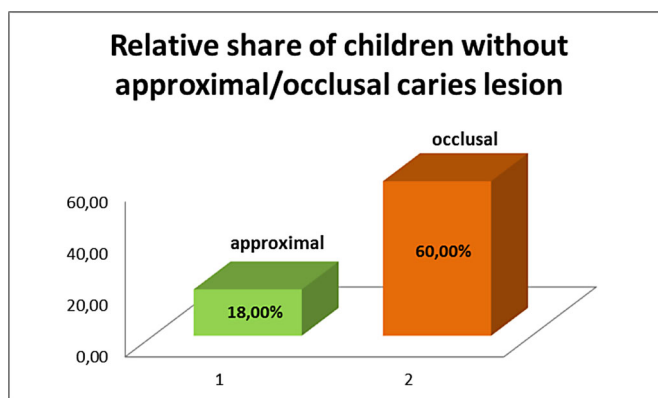
cally significant difference ($P>0,05$) in the relative share of approximal caries on first and second primary molar. There is a statistically significant difference ($P<0,05$) in the relative share of the occlusal carious lesions which affects the second primary molar the most. This is confirmed by other epidemiologic researches which report that the occlusal surface of the second primary molar is more affected by the carious process compared to the one on the first primary molar [15,16,19,20].

Fig. 3. The relative share of the approximal and occlusal caries on primary molars in 5-7 – year-old children.



The relative share of the children without occlusal caries on primary molar is 60% while those without approximal is barely 18% (fig. 4). These results show the difference with other literature sources which report for 34% and more approximal caries free children [21, 22, 23]. Some authors prove that 68% of the children at 6 years have approximal caries on primary molars, while barely 32% are without approximal caries on primary molar [24].

Fig. 4. The relative share of children without approximal/occlusal caries lesion on primary molars.



CONCLUSION:

As a result from the conducted epidemiological research in this age group 93% of the children have experience with caries, and barely 7% are caries free ($dmft/DMF(T+t)=0$). The intensity $d_{1-3}mft$ and $D_{1-3}MF(T+t)$ of the carious lesion has average value of $5,76 \pm 2,9$. The relative share of the approximal caries of the primary molars on maxilla and mandible is 81,5% for both. The relative share of the occlusal caries is 19,6%. In the current research it is not established statistically significant difference ($P>0,05$) concerning the approximal carious lesion on first and second primary molar. There is the statistically significant difference ($P<0,05$) in the relative share of occlusal caries, which mainly affects the occlusal surface on the second primary molar. The relative share of the children without occlusal caries on primary molar is 60%, while those without approximal caries is barely 18%.

The received data confirms the high distribution of caries in 5-7 – year-old children, related with the approximal surfaces of the primary molars. There are differences in the distribution and the severity of the approximal and occlusal carious lesions on primary molars. The epidemiological research confirms the importance of current problem related to the prophylaxis and the dental health in childhood age.

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