

Prevalence of Dental Caries in Hearing Impaired Children than 5 to 12 Years Old in Sofia

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Abstract: Introduction: Hearing impaired children are part of children with special needs in Bulgaria. To them so far not studied for incidence of dental caries. She is one of the very important indicators in the assessment of risk for its development, which is important for the modeling of the oral environment in every child. Aim: To determine the incidence of dental caries in hearing impaired children from 5 to 12 years old and a control group of healthy peers in Sofia. Materials and methods: The study covers 100 hearing impaired children and a control group of 100 healthy children. To them was assessed the prevalence of dental caries with index of the Klein, Palmer & Knutson (1938) - DMFT, taking into account the total number of teeth that are carious (D), missing (M), due to caries or filling (F). Results: The results obtained show that the incidence of dental caries in 89% of the hearing impaired children and 76.8% of healthy peers is over 4 DMFT. The value of the DMFT index in both groups is respectively 5.02 and 4.39. Conclusion: The results clearly show the need for preventive measures to improve the dental health of children.

Keywords: DMFT index, dental caries, prevalence, hearing impaired children, oral health

1. Introduction

Dental caries is a multifactorial disease and to master him is required complex approach, including risk assessment his development and recommendations for healthy behaviors [1].

As a process left without control he may occur and developing at any age, individual, group or society. This requires the establishment of prevention programs, even in countries that have achieved real constraint of its distribution [1, 2].

Aim

The aim of this study was to assess the prevalence of caries in a group of hearing impaired children and the results obtained to be compared a control group of healthy their peers.

2. Material and Methods

The study covers 100 hearing impaired children from school "Prof. dr. Decho Denev" in Sofia from 5 to 12 years and a control group of 100 healthy children responsible under the age of experimental group. Children was included in the study after signing the informed consent of their parents. To them was assessed the prevalence of dental caries with the Index DMFT of Klein, Palmer & Knutson (1938), taking into account the the total number of teeth that are carious (D), missing (M), due to caries or filled (F). Was complied ethical standards for medical research on humans, enshrined in the Declaration of Helsinki of the World Medical Association, approved by the 18th World Medical Assembly Helsinki, Finland (1964) and last amended by the 52nd General World Medical Assembly, Edinburgh, Scotland (2000). To conduct of the study was the permission by the Commission ethics scientific research (KENIMUS) at the Medical University - Sofia.

In diagnosing and record the status of the hard dental structures was complied WHO criteria (WHO Oral Health Surveys Basic Methods Geneva, 1997) and the standards for infection control. Were used dental mirror and sterile gloves under the optimal artificial light. Was diagnosed and the earliest reversible carious lesions in enamel. Was used visual diagnostics and instrumentally examination conducted to specify the stage of development of carious lesions identified with the tool DIAGNOdent.

The activity of caries lesions was determined by applying visual clinical criteria: lesion located in areas susceptible to development of caries and located under the dental plaque; loss transparently; loss smoothness; change in color; lack of clear lines; presence of poor oral hygiene - dental plaque over the lesion; loss of gloss; secondary carious lesions up to old restorations. Were used and evaluation criteria stationing lesions: lesion located at a distance from the typical development of caries places; limited sizes; having clear boundaries with healthy enamel; color; lack of dental plaque.

The data of any of the children studied were registered in ambulatory card made and applied in the Department of Pediatric Dentistry, Faculty of Dental Medicine, Medical University, Sofia. Statistical data processing is performed with a software program product SPSS for Windows 11.5.

3. Results

Dental examination included a registering of existing teeth and their condition. Was taken into account early reversible carious lesions in stage D1 and D2, the irreversible carious lesions, cavitated or not cavitated in stage D3 and the complicated carious lesions in stage D4.

In **Table 1.** is presented the index DMFT + dft, reflective the prevalence of caries in the deaf and healthy children

Table 1: Prevalence of dental caries in deaf and healthy children

DMFT+dft	Deaf Children	Healthy Children	t	p
Up to 2 DMFT+dft	10% (10)	17% (17)	0.57	>0.05
Up to 4 DMFT+dft	1% (1)	7% (7)	0.63	>0.05
Over 4 DMFT+dft	89% (89)	76% (76)	2.29	<0.05

The data in the table shows that the group of children with hearing impaired 89% have a frequency of dental caries over 4 DMFT+dft. In one tenth the frequency is 2 DMFT + dft, and 1% up to 4 DMFT + dft. The results showed that 76% of healthy children have an index DMFT + dft over 4 and for the remaining child index DMFT + dft is 2 (17%) and 4 (7%). The comparison of two groups of children showed a statistically significant difference only in the high frequency of dental caries over 4 DMFT+dft. Obviously, in deaf children were not conducted preventive care, which resulted in the final result is a high prevalence of dental caries.

Table 2 is presented prevalence of reversible carious lesions in children with impaired hearing and healthy children from the control group.

Table 2: Distribution of the reversible carious lesions

Carious lesions	Deaf Children	Healthy Children	t	p
D1 mean±SD	2.69±2.63	2.0±0.64	2.46	>0.05
D2 mean±SD	1.75±2.44	2.11±0.87	1.24	<0.05

The reversible carious lesions at the review of the deaf and healthy children show the existence of reversible caries pathology, as in children with impaired hearing to establish an average of 2.7 reversible carious lesions in stage D1, while in the healthy children are 2 average per child. The difference between these values is statistically significant ($t=2.46$, $p < 0.01$). When comparing the reversible carious lesions in stage D2 has not been established a statistically significant difference between the two groups ($t=1.24$, $p > 0.05$).

In **Table 3** is reflected activity of reported reversible carious lesions in the two groups of children.

Table 3: Active carious lesions in the deaf and healthy children

Active carious lesions	Deaf Children	Healthy Children	t	p
There is no	40% (40)	13% (13)	3.5	<0.001
Single	43% (43)	37% (37)	0.54	>0.05
Over one	17% (17)	50% (50)	4.7	<0.001

The presence of the reversible active carious lesions shows that there is an active caries environment in the mouth of the affected individual. Therefore, detection and the number of active carious lesions used to assess the risk for the development of caries. Analysis of the results shows that most of deaf children are diagnosed with reversible lesions. It was found statistical representativeness in the groups of children who do not have active caries pathology ($t=3.5$, $p < 0.001$) and those with more than one reversible carious lesions ($t=4.7$, $p < 0.001$). This imbalance of factors existing in the oral environment of the these children have to be taken emergency measures to normalize.

Table 4: Active and inactive carious lesions in the deaf and healthy children

Carious lesions	Deaf Children	Healthy Children	t	p
Active	1.96±1.37	1.61±0.67	2	>0.05
Inactive	2.45±2.51	2.56±1.35	1	>0.05

At the comparison of active and inactive carious lesions in experimental and control group no statistically significant difference. This imbalance of factors acting in the oral environment of these children have to take urgent measures to normalization. On Table 5. is presented distribution of the irreversible carious lesions in deaf children and their healthy peers.

Table 5: Distribution of the irreversible carious lesions

Irreversible carious lesions and index DMFT+dft	Deaf Children	Healthy Children	t	p
D3 mean±SD	2.79±3.23	0.96±0.80	5.38	<0.001
D4 mean±SD	0.26±0.88	0.06±0.25	3.84	<0.001
M mean±SD	0.23±0.83	0	2.77	<0.05
F mean±SD	1.74±1.67	3.3±1.39	5.2	<0.001
DMFT+dft mean±SD	5.02±1.62	4.39±1.83	2.1	>0.05

The caries pathology of the irreversible carious lesions in deaf children compared with that of healthy children reflects credible longer irreversible carious lesions D3 ($t=5.38$, $p < 0.001$) and D4 ($t=3.84$, $p < 0.001$) in children with impaired hearing, which is clear evidence of the progression of the process in the absence of administration of preventive or treatment care. It is clear that the problems on child rearing of these children displace oral care and visit to the dentist. This process leads to longer complications of dental caries. As a consequence, it is seen that in these children has longer of teeth extracted due to caries ($t=2.77$, $p < 0.05$) compared with healthy children. This indicates that dental aid was not provided in a timely manner, leading to complications of caries in of affected teeth and indications for their extraction. At comparison the element F in deaf and healthy children is observed significant difference ($t=5.2$, $p < 0.001$) in the filled teeth that are significantly less in the group of healthy children. Analysis of DMFT+dft index reveals an average of 5.02 children with impaired hearing and 4.39 for healthy. When comparing results not been established statistically significant difference ($t=2.1$, $p > 0.05$), but are reported very high values of both groups, indicating poor dental health. These results indicate that are necessary active caries prevention in the first stages its development and treatment of cavitated lesions, and motivation to change attitudes to oral health in these children.

4. Discussion

In specialized literature are not many data on the problems in the oral health on children with impaired hearing. The main reason for the higher prevalence of dental caries and periodontal diseases are the neglected oral care in comparison with children with normal hearing [3, 4, 5, 6, 7, 8]. Reported that the average of DMFT the index is very high, and it increases with age [9, 10, 11, 12, 13, 14, 15]. The dental care for this subgroup of children with disabilities must be very active [9]. In Bulgaria for the first time inquiries be made on the prevalence of dental caries in

children with impaired hearing within a project to assess the risk of development of caries in children with disabilities (blind, deaf, mentally retarded and with autism), implemented by team of the Department of Pediatric Dentistry, Faculty of Dental Medicine - Sofia and financed by the Medical University - Sofia. For the first time assessment was made and of the initial reversible carious lesions. The assessment on the index DMFT+dft showed troubling results. The deaf children have higher values of the index compared to their healthy peers, but without the significant difference on the results.

Likely the opportunity to the inclusion a greater number of deaf children, agree to participate in the study gives an opportunity to prove caught laws. With respect to the reversible lesions in stage D1 was not detected significant difference between the values of the examined blind and healthy children, indicating that they are with identical in intensity risk factor - active oral environment, a leading to tooth decay. Was found that the average number of the reversible carious lesions in stage D2 is greater in healthy children, is found statistically significant difference between children with hearing disabilities. The presence of initial reversible carious lesions in deaf children showed alarming situation with dental health of these children and the need to improve their oral hygiene, training them for the proper conducting and establishing regular oral hygiene skills, and urgent implementation of the non operative preventive treatment. The irreversible carious lesions in stage D3 were significantly higher in deaf children compared to healthy peers the examined. Our study showed that the extracted due to caries teeth were significantly higher in deaf children compared with healthy children. These are our results are confirmed by the reports on Nunn J. and Murray J. (1987) and Tunis W. (1979) [16, 17].

The complications of tooth decay and teeth extracted due to caries in deaf children is the result of the lack of timely treatment. This indicates that they the lack of treatment results to loss of teeth in the age in which healthy children still do not have this problem. on the background of greater pathology is found that the deaf children have credible less filled teeth, that confirms the lack of dental care. The filled teeth in deaf children were significantly less in comparison with healthy controls. The active and inactive lesions in the experimental group on children with hearing impairments can not be distinguished credible from the control group of healthy children. Current understanding of the nature of dental caries as a multifactorial disease and as a process that left without control may occur and be developed at any age, individual, group or society requires permanent existence of and implementation of prevention programs, even in countries who achieved real restriction on its frequency [1, 2]. For his the management are required a comprehensive approach, including a risk assessment of dental caries, recommendations for healthy behaviors and clinical professional care on the part of general dentists [1]. Persons with special health needs are described as such, who face more barriers in obtaining dental care compared to the other. They may experience greater difficulties in access to dental care or may have an increased risk of dental disease or his treatment [18, 19]. People with disabilities also face barriers

to achieving good oral health and obtaining appropriate dental services [19].

In the last 15 years of the the initial caries prevention is a high priority in the work of the dentists [1, 2]. Efforts are to increase resistance of the hard dental structures and specially of the enamel through the modeling the oral environment through the establishment of prevention programs with which to influence the risk factors for the development of caries. Especially the adjustment of the the carbohydrate diet, topical application of fluoride, sealants and remineralizing agents [1].

In Bulgaria in recent years started treatment of non cavitated carious lesions with low viscosity resin [20]. This is a relatively new minimally invasive treatment method with enormous potential in pediatric dentistry. This method can be used for stationing of the enamel carious lesions developing on the smooth tooth surfaces and in the approximal surfaces of molars temporary and permanent molars and premolars [20]. The high scores of "success" after administration of caries infiltration technique with ICON® in permanent dentition according to the study of Kabaktchieva and colleagues can explain with the following: children with permanent dentition have higher efficiency of caries prevention – consciousness for food and oral prevention and generally they are more responsible. And this leads to lower risk of deepening of the approximal lesions. The possibility of failure of the infiltration requires strict professional control in order to prevent complications of dental caries [20].

5. Conclusion

The results obtained show how necessary the creation of prevention programs focused to the specific risk in children with impaired hearing in order to avoid the complications and treatment efforts.

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