

Features of Dental Hard Tissue in Children With Hearing Impairment

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Annotation: Children with hearing impairment have a burdened dental status; during examination, in 66.4% of cases, hypoplasia of hard dental tissues was diagnosed, the clinical course of which depended on the degree of hearing impairment. Children with hearing loss are significantly more likely to have a high level of caries resistance (18.6% versus 2.6%; $P < 0.001$), the average level was found in 72.1% of children with hearing loss, which is 3.7% higher ($P < 0.05$). A low level was significantly more often recorded in children with deafness (21.1% versus 9.3%; $P < 0.01$). A very low level of resistance was observed only in children with deafness in 7.9% of cases.

Keywords: Hearing loss, caries resistance, hard dental tissues, hygienic level, dental status, CP indexes.

Introduction. It is known that the prevalence of dental pathologies, in particular caries, tends to increase in the pediatric population, including among children with disabilities. A number of researchers confirm that children with developmental disabilities are more likely to have unmet dental needs than typically developing children and believe that they are at greater risk of developing dental diseases [2,5,8]. Among the main reasons for the high prevalence of caries and periodontal diseases, one can highlight the insufficient commitment of children, including those with disabilities, to the prevention and treatment of dental diseases, high dependence on caregivers for regular oral hygiene, and in some cases, lack of motivation for healthy lifestyle [3,6]. A feature of oral diseases in patients with hearing impairment is the high intensity of damage to the dental system, the simultaneous development of several independent types of pathology (dental caries, inflammatory periodontal diseases, dentofacial anomalies), the chronic progressive course of pathological processes leading to the formation of foci of odontogenic infection [4, 10]. The practical work of a dentist with disabled children is associated with pronounced difficulties in carrying out therapeutic and preventive procedures for them [1,7]. That is why it is also important to create special programs for sanitary and hygienic training of this contingent of children, using psychological and pedagogical methods that make it possible to increase the effectiveness of primary prevention of major dental diseases [6,9].

Purpose of the study: to study the dental health of children suffering from hearing impairment.

Materials and methods of research: the study was based on examination data of 122 children with hearing impairment aged 5 to 11 years, of which 60.7% were boys (74 patients) and 39.3% were girls (48 patients). The average age of the patients was 7.6 ± 0.5 years. 73 children had hearing loss, and 49 had deafness.

The study involved a survey of parents to study anamnestic data. Clinical examination of the patient's oral cavity included: external examination, examination of the oral mucosa, frenulum, cords, hard dental tissues, assessment of the condition of the bite. Quantitative characteristics of dental damage were determined using the indices CPD (Caries Intensity Index according to Clingman-Port), KP, CPD+cp. The oral cavity was assessed using the hygiene index (Yu. A. Fedorova, V. V. Volodkina).

The level of caries resistance was determined according to A.B. Not enough: high level of resistance – persons who do not have a carious cavity; average level of resistance – persons who have a carious cavity in the chewing group of teeth (on molars and premolars); low level of resistance - with damage to teeth, except for the lower incisors; very low level of resistance – persons with caries lesions of all groups of teeth.

Of all those examined, 62 children had a temporary dentition, and 60 children with hearing impairment had a mixed dentition.

Statistical analysis was carried out using the Excel application program with the calculation of the arithmetic mean and the mean standard error. Statistical significance was determined based on the calculation of Student's t-distribution; the reliability of the data was considered to be an error probability of less than 0.05.

Study results: as a result of a dental examination, it was found that hypoplasia of hard dental tissues was recorded in 81 children with hearing impairment, which amounted to 66.4%, the average intensity was 4.37 ± 0.26 teeth.

Of all children with established hypoplasia of hard dental tissues, hearing loss occurred in 51.8% of cases (43 out of 81), deafness was noted in 38 children (46.9%).

Among 43 children with hearing loss, the intensity of hypoplasia of hard dental tissues was 3.62 ± 0.18 teeth, while among 38 patients with deafness - 5.16 ± 0.15 teeth, which is significantly higher than in children with hearing loss ($P < 0.05$).

Analyzing the indicators of the CPD + CAT, it was found that in children with hearing impairment the average indicators were 7.75 ± 8.15 surfaces. I would like to note that the most pronounced average values of the affected surfaces were obtained in children with deafness - 24.5 ± 2.6 , while the minimum values were overwhelmingly in children with hearing loss. Complicated caries was observed in 12 children, including 8 children with deafness.

Most often, carious lesions were diagnosed on the occlusal surfaces of the teeth of examined children with hearing loss and amounted to 44.2% (19 children). On the contact surfaces of the teeth, the presence of a carious process was noted less frequently and amounted to 30.2% (13 children).

In children with deafness, carious lesions localized on the occlusal surfaces of the teeth also prevailed and amounted to 52.6%, that is, this figure was 8.4% higher than in children with hearing loss. The presence of caries on the contact surfaces of teeth was diagnosed among 34.2% of children with deafness (13 children).

At the same time, according to the CPD indicators, it was revealed (Table 1) that in children with hearing loss, in most cases, a compensated form of caries activity was noted (90.7%), while in children with deafness this form was 19.6% less common (71.1%).

Table 1 Assessment of the dental status of examined children with varying degrees of hearing impairment

CPD indicators	Hearing loss, n=43		Deafness, n=38		Total, n=81	
	abs.	%	abs.	%	abs.	%
1st degree – compensated	39	90,7	27	71,1*	66	81,5
2nd degree – subcompensated	4	9,3	8	21,0**	12	14,8
3rd degree - decompensated	0	0,0	3	7,9	3	3,7

Notes: * - reliability of data between indicators of children with hearing impairment of varying degrees (* - $P < 0.05$; ** - $P < 0.01$).

The subcompensated form was recorded 2.3 times more often in children with deafness (21.0% versus 9.3%; $P < 0.01$). The decompensated form was found in 7.9% of children with deafness, while this form of caries activity was not observed in children with hearing loss.

When assessing the data obtained on the hygiene index, we found that children with hearing loss and deafness in most cases (65.4%) have a satisfactory level; a poor level of hygiene was 2.3 times more likely to be observed in children with deafness.

A good level of hygiene was noted 1.3 times more often in children with hearing loss (34.% versus 26.3%).

Analysis of caries resistance indicators made it possible to establish that children with hearing loss are significantly more likely to have a high level of caries resistance (18.6‰ versus 2.6‰; $P<0.001$), the average level was found in 72.1% of children with hearing loss, which is higher by 3.7% ($P<0.05$). A low level was significantly more often recorded in children with deafness (21.1% versus 9.3%; $P<0.01$). A very low level of resistance was observed only in children with deafness in 7.9% of cases (Table 2).

Table 2 Indicators of the level of caries resistance in children with hearing impairment

Resistance level	Hearing loss, n=43		Deafness, n=38		Total, n=81	
	abs.	%	abs.	%	abs.	%
High	1	2,6	8	18,6***	9	11,1
Average	26	68,4	31	72,1*	57	70,4
Short	8	21,1	4	9,3**	12	14,8
Very low	3	7,9	0	0,0	3	3,7

Notes: * - reliability of data between indicators of children with hearing impairment of varying degrees (* - $P<0.05$; ** - $P<0.01$).

Thus, in children with hearing impairment, a burdened dental status is noted; during examination, in 66.4% of cases, hypoplasia of the hard tissues of the teeth was diagnosed, the clinical course of which depended on the degree of hearing impairment. Most examined children with hearing impairment require dental consultation, oral sanitation and orthodontic treatment.

Conclusions:

1. The frequency of detection of hypoplasia of hard tissues of temporary and permanent teeth in children with hearing impairment is 66.4%, while in children with hearing loss the intensity is 3.62 teeth, and in children with deafness - 5.16 teeth. The most pronounced average values of affected surfaces were obtained in children with deafness - 24.5 ± 2.6 , while the minimum values were overwhelmingly found in children with hearing loss.
2. According to the KPU indicators, it was revealed (Table 1) that in children with hearing loss, in most cases, a compensated form of caries activity was noted (90.7%), while in children with deafness this form was 19.6% less common (71, 1%). The subcompensated form was recorded 2.3 times more often in children with deafness (21.0% versus 9.3%; $P<0.01$). The decompensated form was found in 7.9% of children with deafness, while this form of caries activity was not observed in children with hearing loss.
3. According to the hygiene index, it was found that children with hearing loss and deafness in most cases (65.4%) have a satisfactory level; a poor level of hygiene was 2.3 times more likely to be observed in children with deafness.
4. Children with hearing loss are significantly more likely to have a high level of caries resistance (18.6‰ versus 2.6‰; $P<0.001$), the average level was found in 72.1% of children with hearing loss, which is 3.7% higher ($P<0.05$). A low level was significantly more often recorded in children with deafness (21.1% versus 9.3%; $P<0.01$). A very low level of resistance was observed only in children with deafness in 7.9% of cases.

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