Spinei Aurelia

DENTAL CARIES PREVALENCE IN DISABLED CHILDREN IN THE REPUBLIC OF MOLDOVA

State University of Medicine and Pharmacy "Nicolae Testemitanu", Chişinău, Republic of Moldova

According to the International Organization of People with Disabilities, disability is defined as the result of interaction between a person who has a disability and barriers related to social environment and attitudes he can face [1, 2]. The total number of disabled people in the Republic of Moldova is 184,300 and represents 5.2 % of the total population. The number of children with disabilities is 14,700 representing 2 % of the total number. The ratification by the Republic of Moldova of the UNO Convention on the Rights of Persons with Disabilities in 2010 started a substantial reform in the field of social insurance of this category of people in our country [3]. However, now the situation of persons with disabilities is problematic and joint efforts are required of both the government and society entirely in allocation of adequate resources to increase access and improve quality of health care, including dental care. In our country it has not been studied to date the necessity in the treatment of dental diseases, access to dental care of children with disabilities and its effectiveness.

Purpose: to evaluate the prevalence of dental caries and caries experience in disabled children and comparison of these parameters with healthy children in the Republic of Moldova.

Materials and methods. The study was conducted in the Department of Pediatric Oro-Maxillo-Facial Surgery, Pedodontics and Orthodontics, State University of Medicine and Pharmacy "Nicolae Testemitanu", during the implementation of the Oral Health Programme for children with disabilities and special educational needs. To assess dental caries morbidity there were clinically examined 4673 children aged between 1 and 18 years during 2011–2014. The study included 2315 (49.54 %) children with various disabilities, who constituted the research group (L_1), while 2358 (50.46 %) non-disabled children formed the control group (L_0). There were estimated the indices of dental caries prevalence (PI) and carious experience: dft, dfs şi DMFT and DMFS. The study was approved by the Research Ethics Committee and conducted in accordance with ethical requirements, with the written consent of children`s parents or their legal representatives. The descriptive and inferential analysis of data was performed using parametric and non-parametric tests ($p < 0.05$), as well as EXCEL and SPSS 16.0 software programs by means of the functions and modules of these programs.

Results. All the subjects under observation are native and residents of the Republic of Moldova. The research and control lots represent a proportional

structure by sex, age, place of residence, socio-economic and living conditions. The children in lots of observation were divided into groups according to their development periods. Thus, there were examined 362 (7.75 ± 0.39 %) ante-preschool-age children (0–3 years), 290 (6.21 ± 0.35 %) preschool age children (4–6 years), 1291 (27.63 ± 0.65 %) primary school age children (7–10 years), 1357 (29.04 ± 0.66 %) — secondary school age children (11–14 years old) and 1373 (29.38 ± 0.67 %) — pubertal children (15–18).

Most of the children in the study come from underprivileged families with 2–6 children, their living conditions being precarious. Thus, 52.35 ± 1.04 % of the children in the research group and a large proportion of the children in the control group (46.44 ± 1.03 %) come from socially vulnerable families and 42.33 ± 1.03 % of the children in L_1 and 45.12 ± 1.03 % of the children in L_0 come from poor families. Most children in the study (87.73 ± 0.68 %) suffer from severe disabilities: deep and severe mental retardation, severe hydrocephalus, severe cervical hernia, spastic tetraparesis/tetraplegia etc. They are bedridden and require special care 11.32 ± 0.66 % of children were diagnosed with pronounced disability, and they had moderate mental retardation, autism, epilepsy, double hemiplegia, spastic diplegia, etc. They are not able to care for themselves and independently perform oral cavity cleaning. Only 22 (0.95 ± 0.20 %) children in the research group had a moderate degree of disability, being diagnosed with mild mental retardation, hemi-paretic, hyperkinetic and atonic-astatic form of CP. These children are able to care for themselves and perform independently oral cavity cleaning, but need guidance of persons who take care of them.

Estimating the index of dental caries prevalence (IP) in children in the study, we found a considerable variation in this indicator by age, type and severity of disability and associated diseases. As the data show, caries was detected in 1838 (79.40 ± 0.84 %) children with disabilities, and in 1332 practically healthy children (56.49 ± 1.02; $t = 17.3238$, $p < 0.001$). The maximum values of IP were detected in children with severe (77.79 ± 0.86 %) and multiple intellectual disabilities (82.71 ± 0.79 %). Only 20.60 ± 0.84 % of disabled children examined are caries free. The results of our study have revealed that the number of children and adolescents free of dental caries in the research group is 2.11 times lower compared with controls. There were found untreated carious lesions in most of the children in the research group (44.15 ± 1.03 %), permanent teeth extracted in 21.86 ± 0.86 % and only in 13.39 ± 0.7 % all the carious lesions were resolved. Unlike disabled children, the number of children free of cavities in the control group is significantly higher, representing 43.51 ± 1.02 %, and the share of children with filled carious cavities being higher in 38.97 ± 1.0 %. The number of children with unresolved carious lesions was significantly reduced (14.63 ± 0.73 %) as well as the number of children with permanent teeth extracted due to caries complications (2.89 ± 0.34 %).

As shown, disabled children were estimated to have significantly increased values of indicators reflecting caries experience of temporary dentition dft = 2.23 ± 0.05 and dfs = 4.2 ± 0.09, permanent dentition DMFT = 3.95 ± 0.07 and DMFS = 6.59 ± 0.11 and mixed dentition: DMFT + dft = 5,12 ± 0,07 and DMFS + dfs = 9,31 ± 0,15, compared with the values of these indicators assessed in the children in the control group (dft = 1,47 ± 0,05 and dfs = 2,56 ± 0,09 ($p < 0,01$); DMFT = 1,62 ± 0,04 and DMFS = 2,4 ± 0,07 ($p < 0,001$); DMFT + dft = 2,59 ± 0,07 and DMFS + dfs = 4,28 ± 0,10) ($p < 0,001$). A more important progression is specific for DMFS index values compared with DMFT index, which is particularly pronounced in the group of disabled children. When comparing the level of carious activity in the research and control groups, we found that the increased caries activity is 6.15 times more frequent in disabled children compared to practically healthy children. The comparative analysis of carious experience indicators depending on disability type and severity showed the highest level of dental caries in children with severe and multiple intellectual disabilities: dft = 2.12 ± 0.05, DMFT = 4.01 ± 0.06 and DMFT + dft = 5.03 ± 0.07.

The analysis of the DMFT index structure revealed that component “D” (2.0 ± 0.02 untreated carious cavities) is the most imposing contributor to the index in children with disabilities, constituting 50.51 %, followed by component “M” (secondary anodontia caused by tooth extraction as a result of dental caries complications 1.65 ± 0.01), representing 41.67 % and the share of filled teeth (0.31 ± 0.01) — “F” is only 7.83 %. The highest proportion of filled teeth — 75.93 % (F = 1.23 ± 0.08) was found in children without disabilities placed in residential institutions compared with children in the research group in whom the number of teeth with untreated caries is reduced — 13.58 % (D = 0.22 ± 0.03) and extracted permanent teeth — 10.49 % (M = 0.17 ± 0.02). The differences between the indicators mentioned in L_1 and L_2 groups are statistically significant ($p < 0.001$).

The structure of DMFT index varies depending on the disability severity. Thus, in children with severe disabilities component “D” (2.03 ± 0.06) is the most imposing contributor to the index, constituting 50.62 %, followed by component “M” (1.68 ± 0.33) representing 41.9 %, while the share of filled teeth (0.3 ± 0.03) is minimal, representing only 7.48 %. In children with pronounced disabilities the share of extracted teeth (M = 0.21 ± 0.02) is comparatively low, constituting 18.1 %. It is observed a statistically significant increase in the number of filled teeth (F = 0.32 ± 0.04) — 27.59 % ($p < 0.001$). The share of extracted teeth and teeth with untreated caries is identical (D = 0.05 ± 0.02, M = 0.05 ± 0.03, $p > 0.05$) in children with moderate disabilities, constituting 20.83 % and there is a statistically significant increase in the number of filled teeth (F = 0.14 ± 0.02, $p < 0.001$), the share accounting for 58.33 %.

Thus, maximum share of permanent teeth extracted due to caries complications (M = 4.3 ± 0.06) were estimated in children with severe and profound mental retardation. In addition to the above mentioned, the prevalence of edentation of permanent teeth in the research group was 42.51 ± 1.03 %, being 3.65 times more frequent in comparison with controls ($p < 0.001$). The first lower molars were extracted in 21.2 ± 0.85 % of cases, second molars — 15.3 ± 0.75 %, premolars — 4.02 ± 0.41 %, while incisors and canines — 1.99 ± 0.22 %. First molars were the most common extracted teeth in the control group.

Therefore, analyzing the results of our research we have stressed the need for initiation and implementation of oral health programs for children, applying modern and mini-invasive means and methods of prevention and treatment of the oral cavity diseases, which will contribute to reducing the prevalence and incidence of major dental diseases. Improving dental care provided to children with disabilities under current conditions of the Republic of Moldova must be designed to prevent major dental and periodontal diseases.

Conclusions:

1. The high level of morbidity of dental caries and the large number of extracted teeth from dental caries complications in children with disabilities show an increased prevalence of dental treatment need and insufficient dental care provided to this population.

2. Improving dental care provided to children with disabilities under current conditions of the Republic of Moldova must be designed to prevent major dental and periodontal diseases.

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