

CARIES DIAGNOSIS IN CHILDREN WITH CEREBRAL PALSY OF THE NERVOUS SYSTEM USING ICDAS II CRITERIA

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Studies of the dental status of children with cerebral palsy (CP) are indicative of a high level of dental diseases. The purpose of the study: to assess the incidence of dental caries using ICDAS II criteria in children with CP depending on the severity of motor impairment. Materials and methods. 122 children (mean age 8.8 ± 3.7 years) with spastic forms of CP and 80 healthy children were examined. They were divided into 5 groups according to the Scale of major motor functions. The state of dental caries was determined using the criteria of ICDAS II. Results. The frequency of detection of code 5 of ICDAS II in children with CP was 3.8 times higher than in healthy ones; code 6 - 7.5 times higher. In children from 4 and 5 groups reliably higher percentage of codes 5 and 6 was found in comparison with other children with CP. Conclusions. Higher frequency of caries is observed in children with CP with severe motor impairment according to the Scale of large motor functions.

Keywords: *cerebral palsy; dental caries; ICDAS II.*

Nowadays infantile cerebral paralysis (ICP) or cerebral palsy (CP) remains one of the most common neurological pathologies most often resulting in disability of patients under 18. Considering a high occurrence of dental disorders, difficulty to implement traditional therapeutic and preventive measures, a considerable effect of dental pathology on the quality of life of children with organic lesions of the nervous system, detection of caries lesions in this group of children depending on the intensity of motor impairment remains an important issue [1, 2, 5].

The purpose of the study. Therefore, the purpose of our study was to assess the incidence of dental caries using ICDAS II criteria in children with organic diseases of the nervous system depending on the severity of motor impairment.

Materials and methods. 122 children (mean age 8.8 ± 3.7 years) with spastic forms of cerebral palsy. The children with CP were divided into groups according to the Scale of major motor functions (Gross motor function classification – Expanded and Revised (GMFCS E&R)) [3]: the 1st group (23 children - 18,9 %) included children performing gross motor skills without restrictions, the 2nd group – 26 (21,3 %) children performing gross motor skills with restrictions; the 3rd group – 26 (21,3 %) children walking by means of a hand-held mobility device; the 4th group – 25 (20,5 %) children able to walk with physical assistance; the 5th group – 22 (18,0 %) children transported in a manual wheelchair. The group of comparison consisted of 80 practically healthy children. The parents of all the children involved into the study

were completely informed about the matter of the research and written consents were signed by them.

Caries dental lesions were assessed in all the children by means of (International Caries Detection and Assessment System – ICDAS II [4].

According to the criteria code 0 (ICDAS = 0) corresponds to an intact tooth, codes 1 and 2 characterize initial lesions of the dental enamel (focal demineralization), code 3 corresponds to visible lesions of the dental enamel (superficial caries). Codes 4, 5 and 6 represent carious dental lesions. The criteria are developed considering the fact that every point corresponds to the following degree of lesion (intensity) of the hard dental tissues; and a direct correlation between points and intensity of lesion determined pathomorphologically is evidenced [4].

The data obtained were statistically processed by means of the applied programs MS® Excel® 2010 ТМ, Biostat®, Statistika® 7.0 and using pair and unpaired Student t-criterion.

Results and discussion. The majority of the children examined were diagnosed to be afflicted with spastic forms of CP. Dental examination of children with organic lesions of the nervous system found that caries occurrence was 100% contrary to healthy children from the comparison group where this index was 68,7 %. An average value of caries intensity by the indices of dt, DMF+dt, DMF in children with CP was $6,27 \pm 1,19$, which is 2,3 times higher than that of the healthy children ($2,72 \pm 1,17$; $p = 0,038$).

Analysis of caries lesions according to ICDAS II criteria in children with CP has demonstrated the following. Code 0 in the groups of patients was registered in 73,2% among all the examined teeth. In children from the control group code 0 was registered in 87,97%, which corresponds to the difference between caries occurrence in the patients with CP and without it. Code 1 was not practically registered both in the groups of children with CP and among practically healthy children. It might be associated with certain difficulties in examination of sick children and finding inconsiderable damage of the normal condition of the dental enamel. Code 2 in children with CP was found in $1,43 \pm 1,66\%$ of all the examined teeth against $1,32 \pm 0,72\%$ in the control group ($p > 0,05$). There were no reliable difference found in the percentage of teeth with codes 3 and 4 between children from the control group and those with CP.

Codes 5 and 6 by ICDAS II found reliable difference between sick and practically healthy children: occurrence of code 5 in children with CP was 3,8 times higher than that in healthy ones, it was $5,91 \pm 1,84\%$ against $1,58 \pm 0,92\%$ ($p < 0,05$); code 6 – 7,5 times higher ($7,52 \pm 3,17\%$ against $1,03 \pm 0,54\%$; $p < 0,05$). Such correlations remained during all the periods of occlusion, and difference between indices in the main and control groups was found to be the biggest in children with transitional and temporal dentition.

In children from the 4th and 5th groups who suffered from severe motor impairment a reliably higher percentage of code 5 was found in comparison with healthy children ($7,7 \pm 2,45\%$ in patients from the 4th group; $p = 0,023$; and $9,31 \pm 2,34\%$ in patients from the 5th group $1,57 \pm 0,92$; $p = 0,0028$), as well as code 6 ($9,36 \pm 4,10\%$; $p = 0,048$ and $15,23 \pm 5,1\%$; $p = 0,0077$ respectively against $1,03 \pm 0,54\%$ in the control)

which is indicative of a considerable occurrence of extensive caries of the dentin in these groups of patients.

An extremely high occurrence of code 6 (deep extensive carious cavities) in children from the 5th group with temporary dentition and low indices of enamel caries are of special attention. It is indicative of a quick advance of carious cavities in this group of children.

Finding peculiarities of caries development in children with CP depending on severity of neurological symptoms is an important factor to determine the direction of preventive measures for this group of children.

Conclusions

1. Reliably higher intensity of caries process is found among children with CP with severe motor impairments according to the Scale of major motor functions.
2. Surfaces of the teeth with deep caries (codes 5 and 6 according to ICDAS II) are more often found among children with CP and severe motor impairments.

References

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