INTRODUCTION

Dental caries is still a serious problem in the health care system both in Ukraine and all over the world. Caries is a common chronic disease among children. It occurs twenty times more often than diabetes mellitus, five times more often than asthma, and four times more often than obesity [1, 2, 3].

Dental caries occurs and progresses steadily from early childhood, it leads to the quick destruction of permanent and temporary teeth in children. The reason is first an unfavourable environmental situation, an increase in the frequency of pregnancy pathology, a genetic predisposition to caries, artificial feeding, malnutrition, and the predominance of simple carbohydrates in the food, which leads to a decrease in the pH of the oral fluid, the effect of dental plaque, etc [4, 5, 6, 7].

The maximum frequency of carious lesions falls on the period when the formation and growth of the organism occurs. According to various authors, the percentage of damage to the permanent molars of the upper and lower jaws is the highest in comparison with other teeth in children aged 7 to 12 years [8, 9].

Dental morbidity among children is increasing, so it is a significant social problem that requires effective solutions nowadays. Unfortunately, insufficient attention is paid to the formation and preservation of the dental health of the child population in reforming the medical care system. The destruction of dental prophylactic examination, namely its decentralized planning link. It is associated with the elimination of dental offices in children's educational establishments and has a negative impact on the dental status of children [10, 11]. Despite the high level of development of dental technologies, caries, and its complications occupy a leading place in the structure of dental pathology in children nowadays. This is a difficult social, scientific, and practical problem, which determines the relevance of this research.

The aim of the study was to carry out a comparative analysis of caries and complicated caries indices of children in Poltava and the suburb.

MATERIALS AND METHODS

A dental examination was carried out among 905 children, aged 8-10 years old who studied in schools of Poltava and the suburbs. The examination was done according to the WHO method (1989), and the results were recorded in medical cards. We determined the following indicators in children: the intensity of caries according to decay-missing-filled (DMF) indices in permanent, temporary, and deciduous teeth, the intensity and prevalence of complicated caries, and the need for treating.

The results of the study were statistically processed using the methods of the standard package for statistical calculations Statistica 5.0 Microsoft Office Exel 2003. We calculated such statistical variables as mean values (M) and standard error of the average value (m). We used the t-criterion of Student to compare absolute values. The difference in results was considered statistically significant if the index was p≤0.05.

RESEARCH RESULTS AND THEIR DISCUSSION

We examined 266 children from 8 to 10 years old. They were pupils of the gymnasium in Rozsoshentsy (Shcherbanivsky village council, Poltava region). We also examined 129 children of the lyceum in Shcherbanivka (Shcherbanivsky village council, Poltava region) and in its branch in the village V. Trostyanyts. They were united into one group according to territorial basis, because the above-mentioned educational establishments are located in the suburb, namely, 10 km from Poltava. And we examined city children directly from Poltava itself. They were 225 pupils from 8 to 10 years, who
studied in gymnasium № 6 and 285 pupils from school № 10.

We divided the children into the following groups:
- group 1 - children from the villages Shcherbany and V. Trostyanets;
- group 2 - children from the village Rozsoshentsy;
- group 3 - children from Poltava (gymnasium № 6);
- group 4 - children from Poltava (school № 10).

We calculated the intensity of caries according to decay-missing-filled (DMF) index in each of the above-mentioned groups (8, 9, and 10 years old).

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Schools in villages Shcherbany and V. Trostyanets</th>
<th>Gymnasium in the village Rozsoshentsy</th>
<th>Gymnasium № 6 (Poltava)</th>
<th>School № 10 (Poltava)</th>
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<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>8</td>
<td>1.72±0.24</td>
<td>2.39±0.19</td>
<td>1.88±0.2</td>
<td>1.65±0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>**p≥0.05</td>
<td>*p≥0.05</td>
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<td></td>
<td></td>
<td>***p≥0.05</td>
<td>****p≥0.05</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2.06±0.34</td>
<td>1.81±0.28</td>
<td>1.91±0.26</td>
<td>1.45±0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>**p≥0.05</td>
<td>*p≥0.05</td>
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<td></td>
<td></td>
<td>***p≥0.05</td>
<td>****p≥0.05</td>
<td></td>
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<tr>
<td>10</td>
<td>0.81±0.26</td>
<td>1.63±0.29</td>
<td>1.2±0.23</td>
<td>1.36±0.21</td>
</tr>
<tr>
<td></td>
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<td>**p≥0.05</td>
<td>*p≥0.05</td>
<td>**p≥0.05</td>
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<td></td>
<td></td>
<td>***p≥0.05</td>
<td>****p≥0.05</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.65±0.17</td>
<td>2.18±0.14</td>
<td>1.75±0.13</td>
<td>1.53±0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>**p≥0.05</td>
<td>***p≥0.05</td>
<td>****p≥0.05</td>
</tr>
</tbody>
</table>

Note: * - the difference is significant between groups - 1-4;
** - the difference is significant between groups - 2-3;
*** - the difference is significant between groups - 1-3;
**** - the difference is significant between groups - 2-4;
***** - the difference is significant between groups - 1-2;
****** - the difference is significant between groups - 3-4.

The highest intensity of caries was found in pupils of the gymnasium in the village Rozsoshentsy (2.39 ± 0.19) and the lowest intensity of caries was in pupils of school № 10 in Poltava (1.65 ± 0.18) among 8 years old children. The lowest intensity of caries was found in pupils of school № 10 (1.45 ± 0.2), and the highest indices were in children from the villages Shcherbany and V. Trostyanets (2.06 ± 0.34) in 9 years old children. The lowest intensity of caries according to DMF indices was determined among pupils from a lyceum in the village Shcherbany and its branch in the village V. Trostyanets, namely 0.81 ± 0.26 teeth per one examined child in 10 years old pupils. This index was the highest in pupils from the gymnasium in the village Rozsoshentsy (1.63 ± 0.29).

A statistically significant difference (p≤0.05) was found when comparing caries intensity indicators according to the DMF index in the age subgroup of 8-year-old pupils between the indicators of schools in villages Shcherbany and V. Trostyanets (1.72±0.24) and school № 10 (1.65±0.18) and gymnasium in Rozsoshentsy (2.39±0.19) and gymnasium № 6 (1.88±0.2). In the age subgroup of 9 years, the comparison of caries intensity in schools in villages Shcherbany and V. Trostyanets was 0.81±0.26 and gymnasium in Rozsoshentsy 1.63±0.29 (p≤0.05).

When comparing the other above-mentioned indicators of caries intensity according to the DMF index in age subgroups 8, 9, 10 - year-old pupils of the gymnasium in Rozsoshentsy and school № 10 in Poltava, gymnasium in Rozsoshentsy and gymnasium № 6 in Poltava, schools in villages Shcherbany and V. Trostyanets. No statistically significant difference was found between school in V. Trostyanets and gymnasium № 6, school № 10 and gymnasium № 6, as well as among 9- and 10-year-old pupils of the gymnasium in Rozsoshentsy and Gymnasium № 6 in Poltava.

The level of complicated caries intensity was also determined in children from Poltava and the suburb.
Table 2

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Schools in villages Shcherbany and V. Trostyanets</th>
<th>Gymnasium in the village Rozsoshentsy</th>
<th>Gymnasium № 6 (Poltava)</th>
<th>School № 10 (Poltava)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.28±0.1</td>
<td>0.13±0.03</td>
<td>0.09±0.02</td>
<td>0.09±0.03</td>
</tr>
<tr>
<td>8</td>
<td>*p≤0.05</td>
<td>**p≤0.05</td>
<td>***p≤0.05</td>
<td>******p≤0.05</td>
</tr>
<tr>
<td>9</td>
<td>0.5±0.2</td>
<td>0.14±0.04</td>
<td>0.08±0.04</td>
<td>0.03±0.02</td>
</tr>
<tr>
<td>10</td>
<td>0.81±0.26</td>
<td>0.09±0.05</td>
<td>0.06±0.03</td>
<td>0.16±0.11</td>
</tr>
<tr>
<td>Total</td>
<td>0.29±0.08</td>
<td>0.13±0.02</td>
<td>0.08±0.01</td>
<td>0.09±0.03</td>
</tr>
</tbody>
</table>

Note: * - the difference is significant between groups - 1-4; ** - the difference is significant between groups - 2-3; *** - the difference is significant between groups - 1-3; **** - the difference is significant between groups - 2-4; ***** - the difference is significant between groups - 1-2; ****** - the difference is significant between groups - 3-4.

In the age subgroup of 8-year-old pupils, a statistically significant difference was determined between the intensity of complicated caries in children of schools in villages Shcherbany and V. Trostyanets and gymnasium in Rozsoshentsy (p≤0.05), and when comparing other groups of this age group, there was no statistically significant difference detected (p≥0.05). Comparing the indicators of the intensity of complicated caries in the 9-year-old subgroup, a statistically significant difference was determined when comparing school № 10 with schools in Shcherbany and V. Trostyanets. The highest indices in the subgroup of 10-year-old pupils were found in schools in Shcherbany and V. Trostyanets (0.81±0.26), these children had statistically higher indices when compared with the gymnasium in Rozsoshentsy and the schools in Poltava (p≤0.05).

The level of intensity of complicated caries was statistically significantly higher in pupils of suburban educational establishments compared to children of schools located in Poltava in the subgroup of 9-year-olds, (p≤0.05), except the indicators of the gymnasium in Rozsoshentsy and the indicators of pupils who study at gymnasium № 6 in Poltava.

We noticed that the highest level of complicated caries intensity was found among pupils from the suburb (p≤0.05) after analyzing the data from Table 2. We found the lowest intensity of complicated caries indices in pupils from gymnasium № 6 in Poltava (0.08 ± 0.01) and school № 10 (0.09 ± 0.03). Thus, we can conclude that there is an urgent need to strengthen the measures of dental prevention and treatment among children in rural schools. It is necessary to raise the level of dental awareness among the population of these villages and convey the need for treatment.

The prevalence of complicated caries in children from rural areas is significantly higher than in children studying directly in Poltava (p≤0.05).

The highest prevalence of complicated caries among 8- and 9-years old children was found in pupils from the suburb, namely from the lyceum in Shcherbany (15.58%) and its branch in V. Trostyanets (23.33%). The highest prevalence of complicated caries among 10 years old children was found in pupils of the gymnasium in Rozsoshentsy (9.09%). The lowest prevalence of complicated caries among all the children of all age groups (8, 9, 10 years) was found in pupils of school № 10, namely 6.94% (in 8 years old children), 2.5% (in 9 years old children), 4.91% (in 10 years old children) (Fig. 1).
Figure 1. Prevalence of the complicated caries according to DMF index in children from Poltava and the suburb

More than half of 8-10-year-old pupils from suburbs need dental treatment. 70.5% among 129 children from schools in villages Shcherbany and V. Trostyanets had complicated caries, which was not treated previously. 143 children (53.7%) among 266 examined pupils from the gymnasium in Rozsoshentsy also needed dental treatment. The lowest number of children, who needed dental treatment were found in gymnasium № 6 and school № 10 in Poltava, accordingly, 32.0% and 22.8% (Fig. 2).

Figure 2. The need in dental treatment of children from Poltava and the suburb

Conclusions

Our epidemiological research work evidence that there is no statistically significant difference in the intensity of caries according to the DMF index between children in Poltava and in the suburb (p≥0.05). They were statistically significant in the comparison between the indicators of the gymnasium in the village Rozsoshentsy and schools in villages Shcherbany and V. Trostyanets and educational establishments of Poltava (p≤0.05).

At the same time, the intensity and prevalence of complicated caries is statistically higher (p≤0.05) in children from suburbs, than in children from Poltava. The difference was statistically significant when comparing all groups, except indicators between the gymnasium in the village Rozsoshentsy and school № 10 in Poltava (p≤0.05). We can explain it by the low level of dental awareness of the Ukrainian population, and the closure of dental offices in schools. It leads to the impossibility of constant monitoring of dental health in children.

Prospects for further research

The above-mentioned data show that there exists a high need for work of pediatric dentists in schools, namely, performing oral hygiene lessons. In these classes, it is necessary to inform children playfully about the need to observe the rules of oral hygiene at home and regular medical examinations at the dentist. Thanks to these actions it would be possible to determine the directions for conducting treating and prophylactic measures for improving the level of dental health.
Authors' contribution statement

The authors confirm contribution to the paper as follows: study conception and design: Maksymenko, A.I.; Sheshukova O.V.; data collection: Maksymenko, A.I., Mosienko, A.S., Polishchuk, T.V.; analysis and interpretation of results: Mosienko A.S., Kazakova K.S.; draft manuscript preparation: Maksymenko, A.I., Sheshukova O.V., Kuz I.O. All authors reviewed the results and approved the final version of the manuscript.

Conflict of interests

The authors declare that there is no conflict of interest.

Literature


References


Стаття надійшла 05.04.2023 року

Summary
Despite the high level of development of dental technologies, caries, and its complications occupy a leading place in the structure of dental pathology in children nowadays. This is a difficult social, scientific, and practical problem, which determines the relevance of this research.

The aim of the study was to carry out a comparative analysis of caries and complicated caries indices of children in Poltava and the suburb.

Materials and methods. A dental examination was carried out on 905 children 8-10 years old who studied in schools of Poltava and the suburbs. We determined the following indicators in children: the intensity of caries according to decay-missing-filled (DMF) indices in permanent, temporary, and deciduous teeth, the intensity and prevalence of complicated caries, and the need for treating.

Research results and their discussion. Our epidemiological research work evidence that there is no statistically significant difference in the intensity of caries according to the DMF index between children in Poltava and in the suburb (p≤0.05). They were statistically significant in the comparison between the indicators of the gymnasium in the village Rozsohentsy and schools in villages Shcherbany and V. Trostyanets and educational establishments of Poltava (p≤0.05).

At the same time, the intensity and prevalence of complicated caries is statistically higher (p≤0.05) in children from suburbs, than in children from Poltava. The difference was statistically significant when comparing all groups, except indicators between the gymnasium in the village Rozsohentsy and school № 10 in Poltava (p≤0.05).

Conclusions. We can explain it by the low level of dental awareness of the Ukrainian population, and the closure of dental offices in schools. It leads to the impossibility of constant monitoring of dental health in children.

Key words: caries, complicated caries, intensity, prevalence, children, school, prevention.

УДК 616.314-002.4-03-053.2-021.272(477.53)

ПОРІВНЯЛЬНА ХАРАКТЕРИСТИКА ПОКАЗНИКІВ КАРІЄСУ ЗУБІВ І ЙОГО УСКЛАДНЕНЬ У ДІТЕЙ ПОЛТАВЩИНИ

Максименко А.І., Мосієнко А.С., Шешукова О.В., Кузь І.О., Поліщук Т.В., Казакова К.С.
Полтавський державний медичний університет, Полтава, Україна

Резюме
Рівень стоматологічної захворюваності серед дітей не знижується і є значущою соціальною проблемою, що вимагає ефективних шляхів розв’язання. Карієс зубів виникає і неухильно прогресує з раннього дитячого віку, досить швидко призводить до руйнування тимчасових і постійних зубів у дітей. Попри високий рівень розвитку стоматологічних технологій, карієс раннього дитячого віку, досить швидко призводить до руйнування тимчасових і постійних зубів у дітях, що вимагає ефективних шляхів розв’язання. Карієс зубів виникає і неухильно прогресує з раннього дитячого віку, досить швидко призводить до руйнування тимчасових і постійних зубів у дітей. Попри високий рівень розвитку стоматологічних технологій, карієс раннього дитячого віку, досить швидко призводить до руйнування тимчасових і постійних зубів у дітей.

Мета дослідження. Провести порівняльний аналіз показників карієсу й ускладненого карієсу в школярах м. Полтави і передмістя.

Матеріали і методи дослідження. У рамках планової сантації проведено стоматологічне обстеження 905 дітей віком 8–10 років, які навчалися в школах м. Полтави і передмістя. У всіх школярів визначали: інтенсивність карієсу за індексами Kl, KPV+Кл, KPV, інтенсивність і поширеність ускладненого карієсу, потребу в лакції.

Результати дослідження. Проведені епідеміологічні дослідження свідчать про те, що показники інтенсивності карієсу за індексами KPV+Кл не відрізняються між собою в дітей, які навчаються в школах м. Полтави і передмістя, і були статистично достовірні в порівнянні з показниками Розсошенської гімназії із с. Щербані – В. Тростянською школою і навчальними закладами м. Полтави (p≤0.05).

Інтенсивність і поширення ускладненого карієсу вірогідно вища у школярів навчальних закладів передмістя, у порівнянні з учнями шкіл, що знаходяться безпосередньо в м. Полтаві. Статистично вірогідна різниця була достовірна при порівнянні всіх груп школярів, окрім показників між Розсошенською гімназією і шклою №10 м. Полтави (p≤0.05).

Висновок. Отримані результати можна пояснити низьким рівнем стоматологічної обізнаності населення України, закриттям стоматологічних кабінетів у школах країни. Це призводить до неможливості постійного нагляду за стоматологічним здоров’ям дітей.

Ключові слова: карієс, ускладнений карієс, інтенсивність, поширеність, діти, школа, профілактика.