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COMPARATIVE CHARACTERISTICS OF THE DENTAL DISEASES INCIDENCE IN ADOLESCENTS OF POLTAVA AND THE VILLAGE OF BELOZERIE IN THE CHERKASY REGION

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Socio–economic factors have a direct impact on the dental health of adolescents. Thus, the incidence of caries in senior pupils of the Belozerie village is by 1.49 times higher in comparison with the similar indices in Poltava. Their intensity of the carious process is exceeding the average value of 2.1±0.32 in urban residents by 2.08 times ($p<0.05$). The hygienic condition of the oral cavity in rural youngsters was significantly worse hygiene index=2.32±0.1 than 1.7±0.08 in adolescents living in the city. In the course of our study, it was found that periodontal tissue diseases were observed with the same frequency and amounted to 53.15±4.4 % in v. Belozerie and 56.7±9.32 % in Poltava ($p>0.05$). In adolescents of Poltava, with a satisfactory hygienic condition, the incidence of dental occlusion ano, malies is by 20.2% higher than in the rural youth.

Keywords: dental status, adolescents, socio–economic conditions.

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ПОРІВНЯЛЬНА ХАРАКТЕРИСТИКА СТОМАТОЛОГІЧНОЇ ЗАХВОРЮВАНОСТІ ПІДЛІТКІВ М. ПОЛТАВА ТА С. БЄЛОЗЄР'Є ЧЕРКАСЬКОЇ ОБЛАСТІ

Соціально економічні фактори мають безпосередній вплив на стоматологічне здоров'я підлітків. Так, поширеність карієсу серед старших школярів с. Бєлозєр'є в 1,49 рази вище, порівняно з аналогічними показниками в м. Полтаві. Інтенсивності карієсу в 2,08 разів перевищує середнє значення 2.1±0.32, мешканців міста ($p<0.05$). Гігієнічний стан порожнини рота у сільській молоді достовірно гірше 2,32±0,19, проти 1.7±0.08 у підлітків, які проживають в місті. В ході нашого дослідження встановлено, що захворювання тканин пародонта відзначалися з однаковою частотою і склали 53,15±4,4 % в с. Бєлозєр'є і 56,7±9,32 % в м Полтава ($p>0.05$). У підлітків м. Полтави при задовільному гігієнічному стані поширеність аномалій прикусу на 20,2 % вище, ніж аналогічні показники сільської молоді.

Ключові слова: стоматологічний статус, підлітки, соціально–економічні умови.

The study is a fragment of the research project "Mechanisms of the pathogenic factors impact on the dental status of persons with somatic pathology, ways of their correction and blocking" state registration No. 0115U001138.

Adult oral health depends on childhood oral health. Prevention improves oral health in childhood and, as a consequence, in adulthood, so there can be significant cost savings through prevention. The burden of oral disease is particularly high for poor populations. Therefore, adequate and equitable access to dental care becomes a desirable goal if children's dental health is to improve regardless of socioeconomic status. Development of preventive measures should be preceded by epidemiological studies, however, changes in the socio–economic situation in the country in recent years have caused some difficulties in carrying out large–scale epidemiological surveys [9, 10]. Currently, for scientific prognosis and preventive activities coordination, it is necessary to study the level of dental morbidity and the preventive measures efficiency among residents of each region [6, 7].

Numerous studies indicate a higher incidence and intensity of caries in children living in areas with a fluoride deficiency in drinking water [2, 4, 6, 9]. Some authors draw attention to the influence of socio–economic factors on dental morbidity [3], and the tendency of its growth in children living in rural areas.

The study of dental morbidity reveals the factors of disease occurrence, determines the degree of risk, justifies the prognosis, develops treatment strategies and evaluates the effectiveness of prophylaxis. Special attention should be paid to the study of the relationship between geographical, geochemical and social factors in the occurrence of dental diseases.

Due to the fact that the role of many cariogenic factors has lately changed, it is advisable to study the dental incidence in adolescents living in areas with different concentrations of fluoride in the city and the rural areas.

The purpose of work was to study the incidence and structure of dental diseases in adolescents depending on the impact of social and geographical factors.

Materials and methods. The examined patients group comprised 229 (100 %) 15–16 years old adolescents, among them 107 (46 %) being pupils of secondary schools No. 4 and No. 19 in Poltava and 122 (54 %) pupils of secondary schools No. 1 and No. 3 in v. Belozerie of the Cherkasy region (67 girls and 55 boys). The mean age was 15.4 years.

The teenagers examined lived in regions different as to the fluorine content in the water and the level of its mineralization. The population of Poltava is known to use water with the optimal fluorine content and low mineralization, and in v. Belozerie, Cherkasy region, the water used has a low fluorine content and high mineralization (Reference of Cherkasy SEIS No. 63).

All adolescents underwent a general clinical dental examination. During the examination, attention was paid to complaints regarding the general condition of the body, periodontal tissue pathology, quality of oral cavity care, dental occlusion anomalies, soft tissues, the condition of hard tooth tissues, the presence of non–carious lesions were considered.

When interviewing adolescents, the features of their lifestyle, diet, bad habits, physical activity, and particular features of oral cavity care were taken into account. The survey results were entered into a medical card.

Intensity of the carious process was assessed by the DMF index, the incidence and severity of periodontal tissue diseases – by the PMA and PI indices. The thoroughness of oral cavity care was assessed using the Green–Vermillion hygienic index [7]. Statistical processing of the study results was carried out using the Microsoft Office Excel software and the Real Statistics 2018 extension to it. The Student's t–test was used to determine the statistical significance of differences between the groups. The difference was considered statistically significant at.

Results of the study and their discussion. A detailed analysis of the hard tooth tissues status showed a high incidence of caries in adolescents of the Cherkasy region, which amounted to 91.24±3.6 %, and was by 1.49 times higher compared to the similar indices in Poltava. A similar trend was also observed when comparing the carious process intensity values. Thus, in v. Belozerie of the Cherkasy region, the mean DMF value amounted to 4.38±0.4, which was by 2.08 times higher than that in Poltava ($p<0.05$). The dependence of the carious process on the concentration of fluorine in drinking water was also noted in a number of studies [1, 3]. However, the comparison was carried out in regions with an optimal fluorine content (Poltava city) and increased (Mashevka village, Poltava region). The dependence of the carious process on the concentration of fluorine in drinking water was also noted in a number of studies [1, 3]. However, a comparison was carried out in regions with optimal fluorine content (Poltava city) and those with elevated one (village of Mashivka, Poltava region).

We have also analyzed the main indices of dental status depending on the gender, but there was no statistically significant difference in any of the values in these regions, which permitted to present the data in the summary table 1.

Proceeding with the hard tooth tissues status assessment, we paid attention to the oral cavity hygiene condition. Hygiene index in adolescents of the Belozerie village in this age group was 2.32±0.19, which indicates poor oral hygiene. Meanwhile, this index in Poltava adolescents was 1.7±0.08, which corresponds to a satisfactory condition of the oral cavity ($p<0.05$).

It should be noted that 30 (28.08 %) of Poltava adolescents regularly brush their teeth and have a good hygienic index, 56 (52.3 %) having a satisfactory, while the remaining 21 (19.62 %) having a poor one. Teenagers living in the city, apply additional means of the oral cavity, hygiene, they know the main types of toothpastes. The data obtained correspond to our previous studies [5].

The questionnaire on dietary habits, physical activity and bad habits revealed that the majority of urban adolescents consume few dairy products and many sweets, do not walk and play sports enough, abuse of smoking.

Among adolescents living in rural areas, only 13 (6.95 %) take good care of the oral cavity. 85 (45.39 %) do not consider it necessary to brush their teeth properly and regularly. The overwhelming majority of respondents report a single daily oral cavity care, in the morning, before breakfast, does not use and do not know about additional hygiene products, which indicates a low level of sanitary and hygienic knowledge.

The rural adolescents questionnaire on their diet features revealed that all of them receive a free glass of milk every day at school, consume a lot of fresh vegetables and fruits, and almost all consume little refined carbohydrates (less than 50 grams per day). Living in rural areas, adolescents spent a lot of their time in the open air, are engaged in physical labor. The total of 126 (67.28 %) adolescents do not smoke and do not drink alcohol, keeping a healthy lifestyle.

The data obtained indicate the need for targeted health education, ensuring the habit of careful oral care and raising the motivation of youngsters to maintain healthy teeth [8].

Analyzing our data on the dental diseases incidence among schoolchildren in v. Belozerie of the Cherkasy region, who live outside the zone of radiation and industrial pollution and use water of increased mineralization with a low fluorine concentration, it can be concluded about the high level of dental morbidity, including caries.

According to the WHO, the age group of 15 years is the key in assessing the periodontal status. In the course of our study, it was established that periodontal tissue diseases were recorded in every second adolescent and amounted to 53.15±4.4 % in v. Belozerie and to 56.7±9.32 % in Poltava ($p>0.05$). The incidence of such symptoms as bleeding gums and the presence of hard dental deposits mainly corresponded to the symptoms of chronic catarrhal gingivitis with the mean PMA values of 28.48±0.06 % and 25.34±4.7 %, respectively ($p>0.05$). Studies [4] indicate a significant prevalence of periodontal pathology among rural youth. The authors diagnosed manifestations of catarrhal gingivitis in 70 % of the examined persons.

This can be attributed both to poor hygienic condition of the oral cavity in adolescents, and to the presence of orthodontic pathology. In our opinion, in v. Belozerie, the incidence of periodontal tissues inflammatory diseases is largely associated with poor hygienic condition (HI=2.32), while in adolescents of Poltava with satisfactory hygienic condition, the incidence of dental occlusion anomalies is by 20.2 % higher than those of rural youth, that causes a greater frequency of inflammatory processes in the periodontium (table 1).

Table 1

Dental morbidity structure among 15–16 years old adolescents

Indices	Cherkasy (n=122)	Poltava (n=107)
Incidence of caries	91.24±0.6	62.21±0.89*
DMF	4.38±0.4	2.1±0.32*
Incidence of periodontium diseases	53.15±4.4	56.7±9.32
PMA	28.48±3.8	25.34±4.7
Incidence of orthodontic pathology	38.7±4.3	58.9±6.61*
HI	2.32 ±0.16	1.7±0.08*

Note: * – reliability of the indices difference in Cherkasy and in Poltava according to the Student's t–test, $p<0.05$.

Thus, the analysis of the dental morbidity of adolescents aged 15–16 years in Poltava, who use soft water with the optimal fluoride content, revealed a fairly high percentage of occlusion anomalies, caries and periodontal tissue diseases. Our data in general are in agreement with the results obtained by other authors [1, 3, 4]. The research suggests that, along with the number of other cariogenic factors, fluorosis contributes to a more intense course of caries progression. This situation demands wider health policy measures to support primary and secondary caries prevention and management among the children [6, 7]. The important role of fluorides in the prevention of dental caries today is absolutely established, perfectly scientifically substantiated and put into practice [12]. The authors have convincingly shown that in children living in regions with optimal fluoride concentration in drinking water, caries rates are significantly lower than in children living in regions with insufficient halogen content. The studies show that, along with a number of other cariogenic factors, fluorosis contributes to a more intense development of caries. This situation calls for broader health policies to support the prevention and treatment of primary and secondary caries in children. [8].

Summarizing the primary analysis of the obtained assessment data on the incidence and intensity of inflammatory periodontal diseases and occlusion anomalies, we can assume that they are due to a number of factors, including low sanitary and hygienic knowledge of the population, insufficient hygienic oral cavity care and the poor level of dental care provided [8, 11].Other factors contributing to maintaining of the above situation are not excluded [3, 7].

Apparently, attention should be paid to the importance of nutrition, physical activity, hygienic education and training, improving the overall body resistance, impact of negative social and psychological factors of modern society, dental care management and development of new, affordable, safe means of improving caries–resistance.

Conclusion

Socio-economic factors have a direct impact on the dental health of adolescents. Thus, the incidence of caries in adolescents of v. Belozerie was by 1.49 times higher compared to the similar indices in Poltava. The caries process intensity was by 2.08 times higher than the mean DMF value of 2.1±0.32 in urban residents ($p<0.05$). The hygienic condition of the oral cavity in rural young people was significantly worse: HI=2.32±0.19, versus 1.7±0.08 in adolescents living in the city. In the course of our study, it was established that periodontal tissue diseases were observed with an equal incidence and amounted to 53.15±4.4 % in v. Belozerie and 56.7±9.32 % in Poltava ($p>0.05$). In adolescents in Poltava, with a satisfactory hygienic condition, the dental occlusion anomalies incidence was by 20.2 % higher than the similar indices in rural youth.

Prospects for further research are based on the search for scientifically grounded methods for the dental diseases prevention in adolescents living in areas with different climatic conditions.

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BIOCHEMICAL PARAMETERS OF THE EFFICIENCY OF AUTOPLASMA AND HYALURONIC ACID IN THE COMPLEX TREATMENT OF GENERALIZED PARODONTITIS

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In this study, the dynamics of biomarkers of inflammation and the antioxidant system was assessed. The study involved 57 patients aged 36 to 55 years with a diagnosis of generalized parodontitis. In addition to basic therapy, the complex treatment of patients included regenerative techniques: injection of i-PRF, injection of plasmogel from platelet autoplasma and administration of hyaluronic acid. After the treatment, the most pronounced result of a decrease in the content of malondialdehyde was obtained in the group with a combination of plasmogel, hyaluronic acid and injectable platelet rich fibrin, after 1 year – 0.18±0.01 mmol/L, after 2 years – 0.21±02 mmol/l. In all groups, where the treatment with regenerative drugs was carried out, the activity of the catalase enzyme significantly increased in comparison with the comparison group, $p_2 < 0.001$. The data obtained indicate that the applied regenerative techniques are able to actively affect the antioxidant system and reduce the processes of lipid peroxidation, which are one of the trigger mechanisms for the development and maintenance of inflammation in the parodontal tissues.

Key words: malondialdehyde, catalase, plasmogel, lipid peroxidation, antioxidant system.

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БІОХІМІЧНІ ПАРАМЕТРИ ЕФЕКТИВНОСТІ АУТОПЛАЗМИ І ГІАЛУРОНОВОЇ КИСЛОТИ У КОМПЛЕКСНОМУ ЛІКУВАННІ ГЕНЕРАЛІЗОВАНОГО ПАРОДОНТИТУ

В даному дослідженні проводилася оцінка динаміки біомаркерів запалення і антиоксидантної системи. Обстежено було 57 хворих у віці від 36 до 55-ти років з діагнозом генералізований пародонтит. В комплексне лікування хворих крім базисної терапії були включені регенеративні методики: ін'єкційне введення і-PRF, введення плазмогеля з тромбоцитарної аутоплазми і введення препарату гіалуронової кислоти. Після проведеного лікування найбільш виражений результат зниження вмісту малонового діальдегіду був отриманий в групі з комбінацією плазмогеля, гіалуронової кислоти і збагаченого тромбоцитами фібрину, через 1 рік – 0,18±0,01 ммоль/л, через 2 роки – 0,21±0, 02 ммоль/л. У всіх групах, де проводилося лікування регенеративними препаратами, активність ферменту каталази достовірно збільшилася у відношенні з групою порівняння, p2<0,001. Отримані дані говорять про те, що застосовані регенеративні методики здатні активно впливати на антиоксидантну систему і зменшувати процеси перекисного окислення ліпідів, які є одним з пускових механізмів розвитку і підтримки запалення в тканинах пародонта.

Ключові слова: малоновий діальдегід, каталаза, плазмогель, перекисне окислення ліпідів, антиоксидантна система.

The work is a fragment of the research project: "Correction of metabolic disorders pathogenetic mechanisms in the oral cavity tissues of patients depending on environmental and alimentary factors affecting carbohydrate and lipid metabolism", state registration No. 0118U006966.

Among all inflammatory parodontal diseases, a special place is given to generalized parodontitis, which is a serious medical, social and economic problem. The prevalence of this pathology among adults remains at a high level and does not tend to decrease. [3]. The clinical picture of chronic generalized periodontitis is characterized by weak manifestations and latent course, which complicates timely diagnosis and the beginning of treatment and measures [1].