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CONDITION OF PERIODONTAL TISSUES IN CHILDREN WITH BRONCHIAL ASTHMA

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The article presents the results of the periodontal tissues status assessment in children with asthma compared to children without concomitant somatic diseases, the status of periodontal tissues and oral hygiene in children monitoring groups. The above processes can be explained by the influence of somatic pathology.

Key words: children, gingivitis, asthma, periodontal disease, caries, indices, periodontal tissues.

The work is a fragment of the research project "Study of metabolic homeostasis of the body in diseases of the oral cavity in people of different ages and optimization of their treatment and prevention" (state registration No. 0116U004146).

The problem of periodontal pathology in children is caused both by the widespread prevalence of diseases and by the fact that untimely treatment in childhood and adolescence leads then to irreversible lesions of periodontal tissues in adults [1, 3, 5]. For the data of WHO experts 80 % of the children's population are diagnosed with individual signs or the entire symptom of the inflammation in the periodontium [4].

To date, a database has been accumulated on the epidemiological characteristics of the incidence of periodontal diseases in children, which indicate that they continue to increase.

It should be emphasized that gingivitis in children is an independent nosological unit therefore the etiology and pathogenesis of the disease must be interpreted from the standpoint of the age and functional state of the organism [2, 4, 6]. On the other hand, it is commonly believed that gingivitis is the initial stage of inflammatory periodontal disease and is more often diagnosed in children [1, 2, 6].

The modern concept of the pathogenesis of gingivitis is considered as a balanced biological system, with a disturbance of the equilibrium in which the pathological process occurs, and above all, it is a violation of the ratio of "microbial agents - protective mechanisms" [2, 4].

Considering the trigger mechanisms of the inflammatory process in the gums, it is necessary to take into account the state of the general systems of the body in maintaining homeostasis. This is especially true during puberty, when the whole organism is restructuring, which causes a flow of sympathetic impulse to different organs and systems [2, 5].

One of the important pathogenic factors that cause the development of destructive changes in the tissues of the periodontium is the unsatisfactory hygienic state of the oral cavity, which contributes to the accumulation of dental deposits. With insufficient hygienic care of teeth, the intensity of dental deposits correlates with changes in the periodontal state [4, 6].

Due to the functional inferiority of the endocrine, immune competent and other systems, children have reduced adaptive capacity, which causes their primary damage under the influence of exogenous and endogenous factors [1, 2, 3]. The work of many researchers showed that the prevalence of dental morbidity is dependent on the overall health of children, which is considered as the main endogenous factor in the development of periodontal tissue diseases [3, 6].

The purpose of the work was an in-depth study of the periodontal tissues condition features in children with bronchial asthma.

Materials and methods. In accordance with the tasks set, we assessed the condition of periodontal tissues in 240 children with bronchial asthma, aged 7-15 years and 100 of their peers without general diseases. During the analysis, the KPI index, periodontal tissue status indices (PMA, CPI) and hygienic state of the oral cavity (Green-Vermillion Index, OHI-S (1964)) were taken into account. The results are statistically processed.

Results of the study and their discussion. The results of 240 children with bronchial asthma (the main group) survey have showed that the mean PMA index in the patients was $(39.03 \pm 3.15)\%$, which was by 2.3 times higher than the obtained data in children without somatic diseases (comparison group) - $(16.74$

$\pm 5.23\%$ (table 1). It should be noted that the prevalence of chronic catarrhal gingivitis (CCG) mild cases was diagnosed in the examined children in statistically identical ($p \geq 0.05$) percentages: (17.92 ± 2.47) % - in the main group and (16.0 ± 3.67) % - in the comparison group. However, the mean PMA index in the children of the main group exceeded the same data in the comparison group by 2.2 times ($20.81 \pm 2.62\%$ vs. $9.48 \pm 2.92\%$, $p < 0.05$).

Table 1

Condition of periodontal tissues and oral hygiene in children of observation groups				
Indices	Main group n=240		Comparison group n=100	
	PMA index	39.03 \pm 3.15		16.74 \pm 5.23
Gingivitis prevalence (%)	Aбс.	%	Aбс.	%
Mild degree	43	17.92 \pm 2.47	16	16.0 \pm 3.67
Moderate degree	46	19.17 \pm 2.54	12	12.0 \pm 3.25
Severe degree	17	7.08 \pm 1.65	1	2.85 \pm 1.41
Mean PMA values for various severity degrees (%)				
Mild degree	20.81 \pm 2.62		9.48 \pm 2.92	
Moderate degree	44.18 \pm 3.21		15.26 \pm 3.59	
Severe degree	52.12 \pm 3.22		45.48 \pm 4.35	
CPI index				
Healthy sextants	1.85 \pm 0.16		2.94 \pm 0.22	
Sextants with haemorrhage	2.95 \pm 0.22		2.37 \pm 0.21	
Sextants with dental calculus	0.92 \pm 0.15		0.39 \pm 0.11	
Healthy sextants percentage	28.78 \pm 5.46		52.49 \pm 6.25	
OHI-S index				
good	14.58 \pm 2.28		23.0 \pm 4.21	
satisfactory	20.42 \pm 2.60		47.0 \pm 3.22	
unsatisfactory	44.17 \pm 3.21		17.0 \pm 3.76	
poor	20.83 \pm 2.62		12.0 \pm 3.25	

Chronic catarrhal gingivitis of medium severity was objectified in children of the main group in (44.18 ± 3.21)% cases, which was by 2.9 times higher than the PMA data in children of the comparative group (15.26 ± 3.59)%, the mean PMA in children with bronchial asthma was by 1.6 times higher than the values obtained in the comparison group ($19.17 \pm 2.54\%$ vs. $12.0 \pm 3.25\%$).

CCG of moderate severity was diagnosed in children of the main group in (7.08 ± 1.65)% of cases with PMA values (52.12 ± 3.22)%, whereas in the comparison group this nosological unit was (2.85 ± 1.41)% with the mean PMA value (45.48 ± 4.35)%.

In children of the main group, the percentage of healthy sextants was found in 28.78% of cases, which was 1.85 ± 0.16 sextants on average per a patient. In the comparison group, intact periodontium was determined in 52.49% of cases, which was 2.94 ± 0.22 sextants.

The number of sextants with haemorrhage in children of the main group was by 1.2 times higher compared to the similar values in children of the comparison group (2.95 ± 0.22 versus 2.37 ± 0.21 , respectively). The CPI index component "supra- and subgingival calculus" was diagnosed in the main group by 2.4 times more frequently than in the comparison group examination (0.92 ± 0.15 versus 0.39 ± 0.11 , respectively).

Analysis of the OHI-S hygiene index values showed that in children with bronchial asthma "good" and "satisfactory" oral hygiene was observed in 35% of the patients, while in the comparison group this index was by 2.0 times higher (70%). At the same time, "unsatisfactory" and "poor" oral hygiene were determined in (65%) children of the main group versus (29%) children in the comparison group.

Changes in the dental status, including diseases of hard tooth tissues and periodontal tissues in children with chronic somatic diseases, are obviously a reflection of the general changes that occur in the body of a sick child. In particular, with bronchial asthma, signs of impaired immune homeostasis and characteristic features of the autoimmune process are determined, in which microflora plays an undeniable role, especially a variety of microbial, microbial-mycoplasma, microbial-viral associations.

Since immunodeficiency states create a situation in which the body cannot respond with a viable immune response to antigens, this facilitates infection with slightly pathogenic microorganisms, autobacteria or fungi. In addition, the traditional treatment of bronchial asthma with corticosteroids, broad-spectrum antibiotics and sulfonamides, antihistamines and their combination enhances immunological deficiency and impairs colony resistance. This probably explains the high prevalence of tooth hard tissue

and periodontal tissue diseases in children with bronchial asthma, leading to a decrease in the periodontal barrier function and microbial invasion.

On the other hand, an unsatisfactory condition of the child's oral cavity can cause the onset and maintaining of chronic somatic disease, in particular, bronchial asthma. From this point of view, in our opinion, in the presence of a stomatogenic infection focus, in particular, carious teeth and dental deposits, the pathological process in the bronchopulmonary system is in a pathogenetic correlation with the chronic inflammatory process in the oral cavity, which requires constant monitoring of combined pathologies.

In general our results are consistent with the data obtained by other authors [1, 2, 3, 5]. Higher indices of PMA and CPI contribute to the inflammatory process development [2, 3, 5], attempts of the problem statement have been undertaken in Ukraine ever since 2009 [4]. Influence of environmental pollution on dental morbidity in children has been studied by the Ukrainian researchers since the early 2000s [1, 4]. The problem of personal oral hygiene is of significant importance as it is mentioned by the dental science experts [2, 6]. Correlation between the parameters of dental caries intensity, the condition of periodontal tissues and oral hygiene in children was studied and has been confirmed by our survey [3].

Conclusion

Thus, as a result of the dental examination of the children of the main group, a large prevalence of HCG was established with a predominance of moderate and severe forms, and the intensification of inflammatory processes in the periodontium was due to higher indices of PMA and CPI indexes with unsatisfactory oral hygiene [2, 3, 5]. With a high degree of probability, such processes can be explained by the mutually stimulating effect of somatic pathology [2, 3, 6], which aggravates the course of inflammatory diseases in periodontal tissues in this contingent of children.

Prospects of further research lie in the fact that the analyzed indices are planned to be used to objectivize the efficacy of preventive measures aimed at reducing the prevalence and intensity of major dental diseases against the background of somatic diseases.

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Реферати

СТАН ТКАНИН ПЕРИОДОНТУ У ДІТЕЙ ЗА БРОНХІАЛЬНОЇ АСТМИ

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У статті наведені результати оцінки стану тканин пародонта у дітей хворих на бронхіальну астму в порівнянні з дітьми без супутніх соматичних захворювань, стан тканин пародонта і гігієни порожнини рота у дітей усіх груп спостереження. Такі процеси можуть бути пояснені взаємозумовлюючим впливом соматичної патології.

Ключові слова: діти, гінгівіт, бронхіальна астма, пародонтит, карієс, індекси, тканини пародонту.

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СОСТОЯНИЕ ТКАНЕЙ ПЕРИОДОНТА У ДЕТЕЙ ПРИ БРОНХИАЛЬНОЙ АСТМЕ

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В статье приведены результаты оценки состояния тканей пародонта у детей, больных бронхиальной астмой, в сравнении с детьми без сопутствующих соматических заболеваний, состояние тканей пародонта и гигиены полости рта у детей групп наблюдения, такие процессы могут быть объяснены взаимообуславливающим влиянием соматической патологии.

Ключевые слова: дети, гингивит, бронхиальная астма, пародонтит, кариес, индексы, ткани пародонта.

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