

O.I. Godovanets, T.S. Kitsak, O.S. Godovanets  
**CLINICAL DESCRIPTION OF THE CONDITION OF PERIODONTAL TISSUE  
IN CHILDREN WITH DIFFUSE NONTOXIC GOITER**

*Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine*

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**SUMMARY**

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**Key words: children, periodontal tissues, diffuse nontoxic goiter.**

*The study of the prevalence and intensity of destruction of periodontal tissues in children for kindergarten conditions.*

**Methods.** *To address the problems examined 180 children under 12 years. Of these, 150 children with preschool and 30 somatically healthy children. Formed four groups of observations: I group — somatically healthy children (30 people); II group — children from kindergarten level Ia (50); III group — children from kindergarten level IB (50); IV group — children with Regulations II level (50).*

*Dental examination of children carried conventional methods. To determine the state of periodontal tissues used papillary-marginally-alveolar index (PMA) and the estimate of the number of affected sextant. Research hygienic condition of the oral cavity was carried out using the simplified oral hygiene index (OIH-S). We used methods variation statistics using Student's test.*

**Results.** *The results suggest a probable increase of periodontal indices and samples, indicating the deterioration of the periodontal tissues in children with concomitant thyroid disease. It is known that periodontal diseases are multifactorial tissue nature with a predominance of inflammatory or degenerative processes. To install etiopathogenetical mechanism of the pathology of periodontal tissues under conditions of preschool parodontohenni we have analyzed the possible risk factors.*

*Oral hygiene index according to OHI-S is at an unsatisfactory level in all groups of observation and control, which can be a trigger formation of diffuse inflammation in the gums.*

*Local factors provoking inflammation is carious lesions, teeth and jaws abnormalities like. As shown by our research conducted with increasing severity of preschool children increases the number of carious, including untreated cavities. As for teeth abnormalities and deformities, the incidence of them also had a tendency to increase at thyroid pathology, but was not as rapid as in caries.*

*Speaking about the structure of orthodontic pathology, it attracts relatively high frequency of anomalies of the teeth standing alone, including abnormalities of eruption and the number of teeth in children observation group compared with the control. Stored general trend dominance of teeth anomalies and deformations as crowded teeth, narrowing of the upper jaw. Malocclusions met with the same frequency as in somatically healthy children and children with thyroid pathology.*

*Thus, the surveyed our children with kindergarten are required precipitating factors of inflammation in the gums as local and diffuse character, but availability is not a typical clinical picture of chronic catarrhal and chronic hypertrophic gingivitis, pronounced symptom of bleeding and frequent relapses, suggests that the process of gingivitis is morphologically and functionally altered periodontal tissues. Does not exclude a violation of local and systemic defense mechanisms of the oral cavity in children with thyroid pathology.*

**Conclusions.** *The results of the study found that children with preschool, there is a higher percentage of periodontal lesions, indicating the need for further study paraclinical status of dental conditions related thyroid gland to establish causation.*

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**РЕЗЮМЕ**

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**КЛИНИЧЕСКАЯ ХАРАКТЕРИСТИКА СОСТОЯНИЯ ТКАНЕЙ ПАРОДОНТА  
У ДЕТЕЙ С ДИФУЗНЫМ НЕТОКСИЧЕСКИМ ЗОБОМ**

**Ключевые слова: дети, ткани пародонта, диффузный нетоксический зуб.**

*Изучение распространенности и интенсивности поражения тканей пародонта у детей в условиях ДНЗ.*

**Методы.** *Стоматологическое обследование детей осуществлялось общепринятыми методами. Для определения состояния тканей пародонта использовали папиллярно-маргинально-альвеолярный индекс (PMA) и оценку количества пораженных секстантов. Исследование гигиенического состояния полости рта осуществляли с помощью упрощенного индекса гигиены полости рта (ОИH-S). Использовали методы вариационной статистики с использованием критерия Стьюдента.*

**Результаты.** Установлено, что с увеличением степени тяжести тиреопатологии наблюдается рост всех исследуемых показателей.

**Выводы.** Результатами исследований установлено, что у детей, больных ДНЗ, наблюдается больший процент поражения тканей пародонта, что указывает на необходимость дальнейшего параклинического изучения стоматологического статуса в условиях сопутствующей патологии щитовидной железы для установления причинно-следственных связей.

Today the problem of thyroid gland pathology, its impact on the health and development of intelligence, especially in children, is especially relevant. Based on WHO criteria, several Ukrainian regions, including Bukovyna, are rated as territories with low and moderate degree of iodine deficiency, which is a cause of the so-called iodine deficiency disorders, the most predominant of which is thyroid pathology [3].

It should be mentioned that this problem goes far beyond our country. Over the last decade, the disorders caused by the deficiency of iodine in the environment have become the most widespread endocrinal pathology both in children and adults all over the world. According to the WHO assessment, there are about 2 billion people living in the circumstances of iodine deficiency, which is one third of the world's population [1,2,4,5].

This is why the objective of our research was to make a clinical assessment of the condition of periodontal tissue in children with concomitant thyroid pathology, including diffuse nontoxic goiter (DNG).

**Materials and methods.** To this end, we examined 180 children aged 12. We formed four observation groups: Group I: somatically healthy children (n = 30); Group II: children with stage Ia diffuse nontoxic goiter (n = 50); Group III: children with stage Ib diffuse nontoxic goiter (n = 50); Group IV: children with stage II diffuse nontoxic goiter (n = 50). The oral hygiene was evaluated using the Green-Vermillion Simplified Oral Hygiene Index (OHI-S). The periodontal tissue of the children in the study groups was evaluated by establishing the prevalence and structure of periodontal pathologies, establishing the periodontal indexes (PMA, CPI), and analyzing basic etiological factors of periodontal tissue diseases in the given circumstances.

**Results and discussion.** Our research produced the following results. The prevalence of periodontal tissue diseases in somatically healthy children was 63.3% and was approximately 12% lower than in the DNG subjects with a significant difference from all study groups.

The most prevalent of periodontal tissue diseases is chronic catarrhal gingivitis (CCG) (Table 1), with a prevalence of 92% and 94% in Groups II and III, respectively.

The disease was predominantly chronic, with exacerbation of the process in 10.5% of the subjects. Acute catarrhal gingivitis was diagnosed only in 1 child (3.33%) in the control group and in 6 children

with thyroid pathology (4.0%). Chronic inflammation of the gums was clinically accompanied by congestive hyperemia, edema, and gum bleeding.

Table 1

**Structure of Periodontal Tissue Diseases in Control Groups Children**

Group	Chronic Catarrhal Gingivitis	Chronic Hypertrophic Gingivitis	Periodontitis
Control	86.7%	13.3%	0
DNG Ia	92%	8%	0
DNG Ib	94%	6%	0
DNG II	88%	10%	2%

Hypertrophic gingivitis accompanying thyroid pathology, unlike catarrhal gingivitis, was less prevalent, but its fibrosis forms predominated over the granulating forms. The medical history revealed that both forms of chronic gingivitis were characterized by frequent exacerbations (each 2–3 months).

Signs of periodontitis were found only in 2% of Group IV children. This disease was not found in other groups.

In order to establish the severity of the inflammatory process in the gums, the papillary marginal alveolar index (PMA) was calculated. The PMA index was found to be almost equal (around 35%) in Groups II and III. With the increase in the severity of the thyroid pathology, it increased to 42.8% as compared to the control value of 20.3%. In summary of the PMA index, it may be concluded that medium severity gingivitis was predominant in the diffuse non-toxic goiter group, whereas the most prevalent severity in the control group was low (Figure 1).

The bleeding index in children showed a difference between the values in all study groups along with the increase in the severity of pathology ( $p < 0.05$ ). The data are shown in Figure 2.

However, unlike the previous index, the change between the values by severity is different: the most rapid increase in the prevalence of the bleeding symptom is seen between Groups I and II (68.57%). This points towards a conclusion that the advance of CCG in children with the pathology discussed here is mainly related to the disruption of the structure and function of blood vessels and the surrounding tissues, which is observed in long-term thyroid disorders.

According to the WHO recommendations, the condition of the periodontal tissue has been analyzed

Figure 1. PMA index values in the study groups children

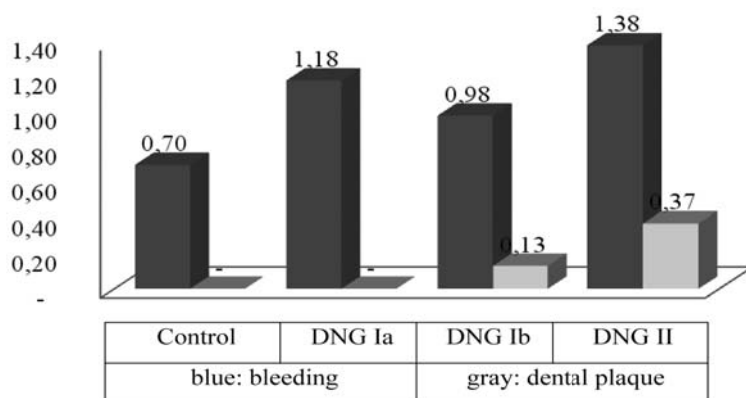
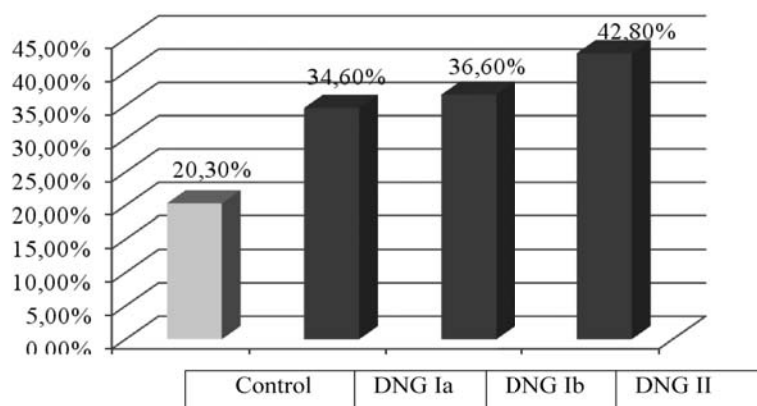


Figure 2. Bleeding index in the study groups children

by the number of sextants affected; the analysis results are shown in Table 2. The number of affected and healthy sextants (using the Schiller–Pisarev test) showed somewhat opposite results, which become worse with the increasing severity of pathology. The gum bleeding in Groups II–III children increased by 28.11%, and in Group IV by 74.13%; the dental plaque figures increased by a factor of 2.5 and 4, respectively. The data obtained once again underscored the lack of objectivity in visual examination and lower accuracy of severity evaluation as compared to the points-based interpretation. Due to this, the prevalence and severity

of the process observed during the examination appear to be lower than they actually are.

The evaluation by these criteria was performed for girls and boys separately. The periodontal tissue disease indicators were higher in girls, which points at the beginning of puberty, which is often accompanied with juvenile gingivitis.

The results show a significant increase of all periodontal indexes and tests, which points at deterioration of the periodontal tissue in children with concomitant thyroid pathology. Periodontal pathologies are known to have a multi-factor nature with predominant

Table 2

Degree of periodontal tissue disease in sextants,  $M \pm m$

Group	Subgroups by gender	Bleeding	Dental plaque	Schiller–Pisarev test	Healthy gums
Control	total	2.01±0.18	0.02±0.001	2.45±0.23	3.55±0.29
	boys	1.82±0.15	0.01±0.002	2.42±0.19	3.58±0.31
	girls	2.2±0.23	0.03±0.001	2.48±0.21	3.52±0.23
DNG Ia	total	2.45±0.21	0.08±0.003	2.89±0.25	3.11±0.20
	boys	2.3±0.19	0.07±0.005	2.63±0.17	3.37±0.32
	girls	2.6±0.22	0.09±0.003	3.15±0.30	2.85±0.23
DNG Ib	total	2.7±0.23	0.06±0.002	3.8±0.27	2.2±0.18
	boys	2.5±0.19	0.05±0.005	3.4±0.29	2.6±0.23
	girls	2.9±0.28	0.07±0.006	4.1±0.35	1.9±0.14
DNG II	total	3.5±0.24*	0.1±0.02*	4.3±0.41*	1.7±0.12*
	boys	3.4±0.30*	0.08±0.01*	3.8±0.28*	2.21±0.23*
	girls	3.6±0.36*	0.12±0.07*	4.7±0.36*	1.3±0.09*

Note: \* - significant difference from the control group,  $p < 0.05$ .

inflammatory or dystrophic processes. In order to establish the etiological and pathogenetic mechanism of periodontal tissue pathology in the circumstances of DNG, we analyzed the possible periodontal pathology risk factors.

Oral hygiene according to the OHI-S index is unsatisfactory in all study and control groups, and may be a trigger for the formation of the diffuse inflammatory process in the gums. In particular, the average values of the simplified index were  $1.83 \pm 0.12$  in Group II,  $1.69 \pm 0.4$  in Group III,  $1.93 \pm 0.14$  in

Group IV, and showed no significant difference with the control group ( $1.74 \pm 0.16$ ).

The local precipitating factors of the inflammatory process are cavities, dentoalveolar anomalies, etc. As seen from the tests performed, as the severity of DNG in children increases, the number of cavities, including the untreated ones, increases as well. As regards dentoalveolar anomalies and deformations, their frequency also tended to increase in case of thyroid pathology, but did not increase as rapidly as in the case of cavities (Figure 3).

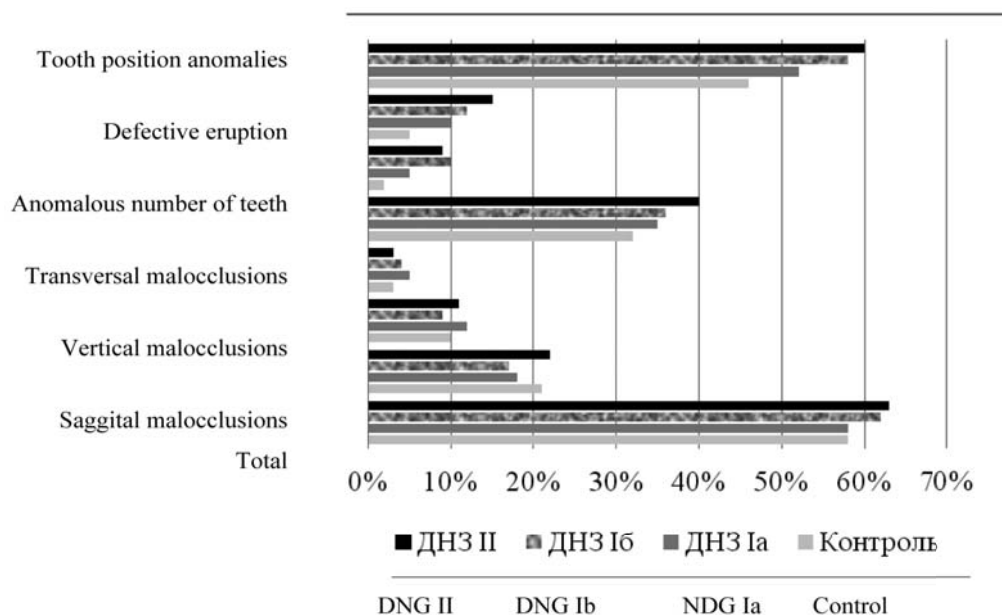


Figure 3. Prevalence of dentoalveolar anomalies and deformations in the study groups children

As regards the structure of orthodontic pathology, a conspicuous fact is the relatively high prevalence of anomalies of isolated teeth, including defective eruption and abnormal number of teeth, in the study groups children as compared to the control group. A remaining general trend is the predominance of such dentoalveolar anomalies and deformations as dental crowding and maxilla narrowing. Malocclusions have been observed with equal frequency both in somatically healthy children and in children with thyroid pathology.

**Conclusions.** Therefore, the children with DNG examined by us have the required precipitating factors of inflammatory process in the gums both of local and diffuse nature, however, the atypical clinical presentation of the chronic catarrhal and chronic hypertrophic gingivitis, expressed bleeding symptom, and frequent relapses of the diseases point towards the conclusion that the gum inflammation process takes place in morphologically and functionally changed periodontal tissues. We do not rule out the possibility of disorders of local and systemic oral cavity protection mechanisms in children with thyroid pathology.

**Prospects for further research.** The results of clinical and paraclinical examinations of children will

develop a scheme of therapeutic measures in chronic catarrhal gingivitis in this group of children and evaluate its effectiveness in a clinical setting.

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