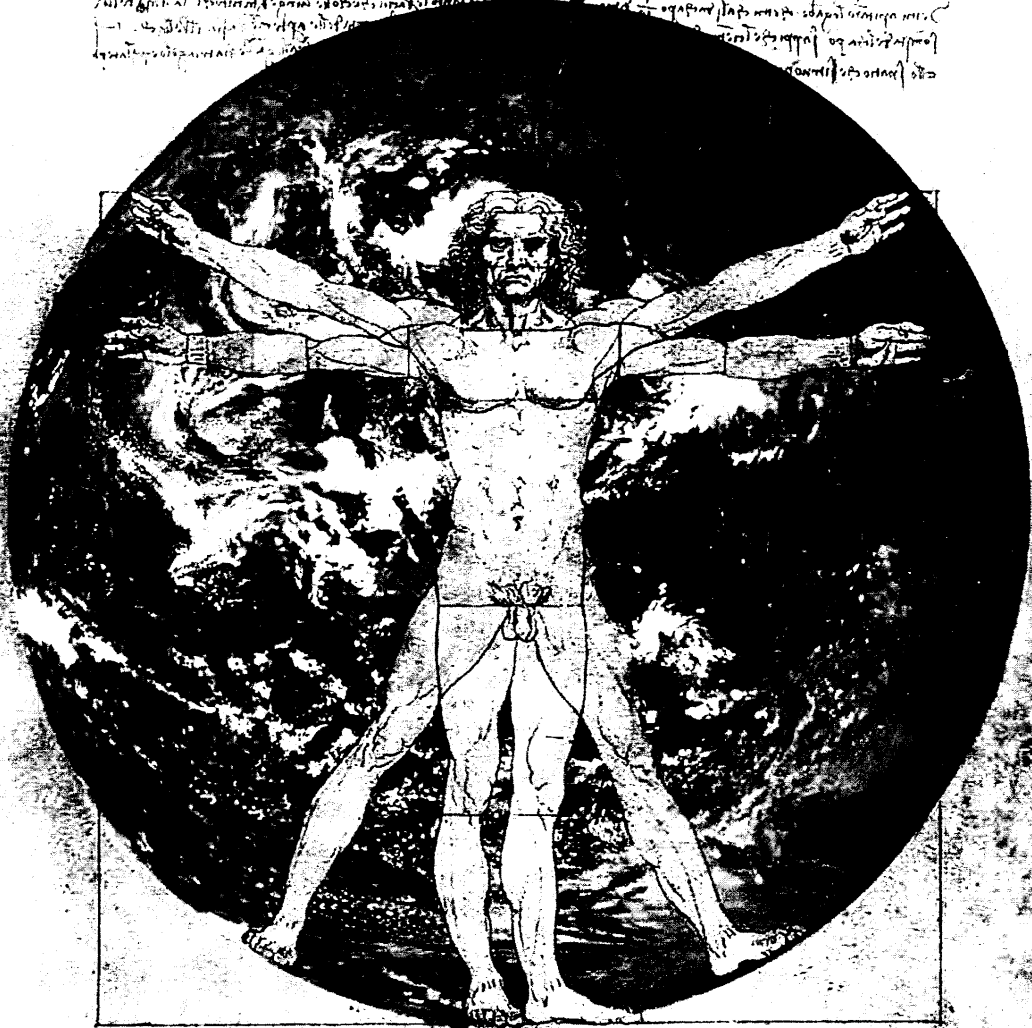


International journal



"Euro-American Scientific
Cooperation" vol. 4

International Journal

EURO-AMERICAN SCIENTIFIC COOPERATION

www.escj.eu

Volume #4 May 2014

Research articles

Hamilton 2014

Section IV. Medicine

**O. I. Hodovanets, Associate Professor
Bukovyna State Medical University, Ukraine**

*Годованець О.І. доцент
Буковинський державний медичний університет, Україна*

CLINICAL DESCRIPTION OF THE CONDITION OF PERIODONTAL TISSUE IN CHILDREN WITH THYROID PATHOLOGIES

КЛИНИЧЕСКАЯ ХАРАКТЕРИСТИКА СОСТОЯНИЯ ТКАНЕЙ ПАРОДОНТА У ДЕТЕЙ С ТИРЕОПАТОЛОГИЕЙ

The paper presents a study of the condition of periodontal tissue in children with diffuse non-toxic goiter, including the study of prevalence and intensity of periodontal disease, as well as an analysis of the clinical forms of these dental diseases.

Keywords: children, periodontium, diffuse non-toxic goiter.

Работа посвящена исследованию состояния тканей пародонта у детей с диффузным нетоксическим зобом, в частности изучению распространенности и интенсивности заболеваний пародонта, а также анализа клинических форм этих стоматологических заболеваний.

Ключевые слова: дети, пародонт, диффузный нетоксический зоб.

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 [1, 2, p 128].

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 [3, 4, 5].

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

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 non-toxic goiter (n = 50); Group III: children with stage Ib diffuse non-toxic goiter (n = 50); Group IV: children with stage II diffuse non-toxic 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.

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 (Figure 1)

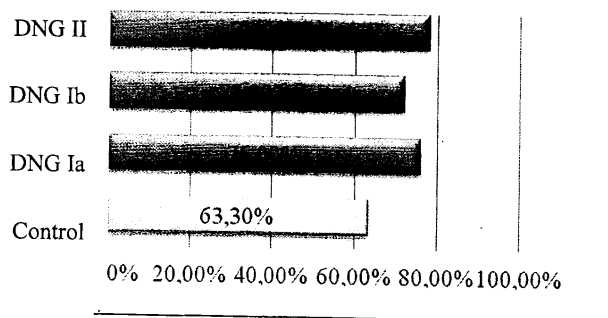


Figure 1. Prevalence of periodontal tissue diseases in study groups children.

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

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 2).

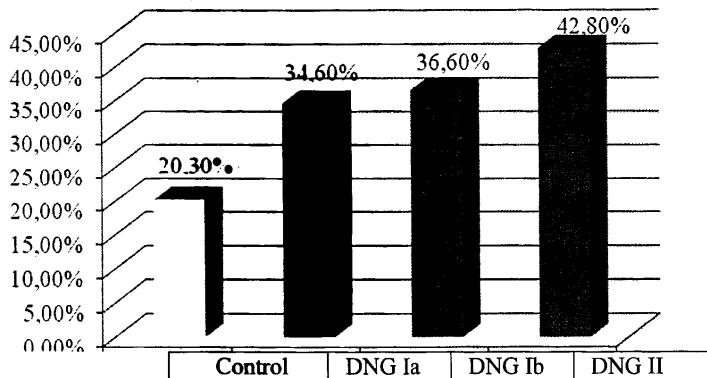


Figure 2. PMA index values in the study groups children

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 3.

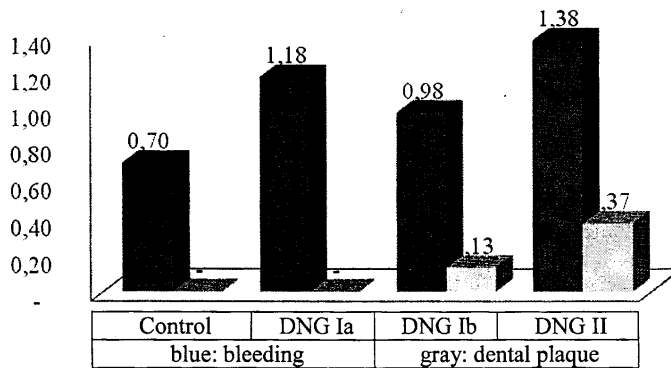


Figure 3. Bleeding index in the study groups children

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 by the number of sextants affected; the analysis results are shown in Table 3.5. 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.

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, $p < 0.05$.

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 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 (Figure 4) 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 ±0.12 in Group II, 1.69 ±0.4 in Group III, 1.93 ±0.14 in Group IV, and showed no significant difference with the control group (1.74 ±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 5).

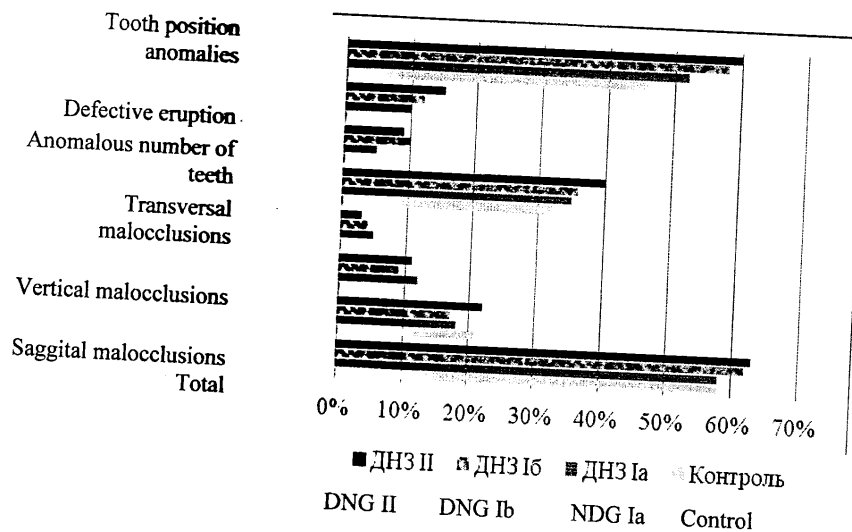


Figure 5. Prevalence of dentoalveolar anomalies and deformations in the study groups children

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.

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.

References

1. N. I. Myroniuk. The Problem of Iodine Deficiency and Ways to Overcome It in the Population of the Western Region of Ukraine: author's abstract from thesis for the degree of Candidate of Medical Science: specialty 14.01.14 "Pediatrics" / N. I. Myroniuk. – Kyiv, 2008 – 23 pages.
2. I. V. Pankiv. Practical Thyroidology / V. I. Pankiv. – Donetsk: O. Yu. Zaslavskyi, publisher, 2011, 224 pages.
3. Haddow J.E. Urine iodine measurements, creatinine adjustment, and thyroid deficiency in an adult United States population / J.E. Haddow, M.R.Clain, G.E. Palomaki [et al.] // J. Clin Endocrinol Metab. – 2012. – Vol.92. – P.1019.
4. Prevalence of iodine deficiency in Europe in 2010 / M.B. Zimmermann, M. Andersson // Ann Endocrinol (Paris). – 2011. – Vol.72. – 164p.
5. Rose N.R. Iodine: an environmental trigger of thyroiditis / N.R. Rose, R. Bonita, C.L. Burek // *Autoimmunity Reviews*. – 2002. – Vol.1(1-2). – P.97-1