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## PREVENTIVE INSPECTION OF LYMPH NODES IN SCHOOL-AGE CHILDREN

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### ABSTRACT

*This article presents the results of a study of primary school students. The object of the study was: children aged 7 to 11 years. Examination methods included examination, ultrasound, laboratory methods, cytology, and a Mantoux test to exclude tuberculosis. The survey was carried out in two stages. At the first stage, students of grades 1- 4 (945) of secondary school No. 37 in the city of Andijan were examined. A study of the child's dental status was carried out ( hygiene index). Today, with the emergence of new non-ionizing methods of radiation diagnostics, optimization of research protocols, there is a gradual revision of approaches to examination in pediatrics. In the scheme of ultrasonographic examination of peripheral lymph nodes, we used the determination of Doppler and Doppler parameters. Doppler study was carried out in the mode of color and power Doppler mapping.*

**KEYWORDS:** *Children, Lymph Nodes, Nonspecific Diseases.*

### INTRODUCTION

Currently, in Uzbekistan, there are very acute problems of preserving and strengthening the health of adolescent children. Adolescents are the intellectual and reproductive potential of our country. Preserving and enhancing the health of schoolchildren is one of the most important criteria for the welfare of the state as a whole [2, 9, 11, 12]. In recent years, there has been a

persistent trend towards a deterioration in the health status of the child population. The proportion of chronic pathology is increasing [9].

Chronic lymphoproliferative diseases (CLPD) are common oncohematological diseases accompanied by a highly variable clinical course, unequal prognosis and insufficiently studied survival as one of the main criteria for the long-term effectiveness of anticancer therapy in patients, especially outside the framework of clinical trials.

Nonspecific disease develops more often than intrathoracic lymph nodes. with primary infection with mycobacteria in children and adolescents and much less often in adults with reactivation of nonspecific inflammation in previously infected lymph nodes [2, 8]. All over the world, a nonspecific disease is one of the ten leading causes of death, and occupies a leading position in the structure of mortality from infectious diseases [1, 5, 7]. Like malignant neoplasms, a nonspecific disease is classified as a socially significant disease [7] and should always be included in the differential series when mediastinal lymphadenopathy is detected. According to E.A. Kuznetsova, 2008 [13], nonspecific disease in adolescents refers to multifactorial diseases, which determines the characteristics of its course.

Nonspecific disease in adolescents is characterized by negative clinical and epidemiological features associated with insufficient effectiveness of preventive measures, the main focus of which should be not only early detection of the disease using a complex of modern technologies, but also unfavorable provoking factors associated with the violation of anti-infectious protection in the population as a whole. [7, 11]

In world practice, in patients with signs of nonspecific infection, the possibilities of ultrasound diagnostics are mainly aimed at finding fluid accumulations in the pleural, abdominal, and pericardial cavities; diagnostics of pathology of specific changes in the kidneys, as well as in peripheral and mesenteric lymph nodes [1, 2, 3, 15, 17]. Lymph node changes are often an accidental finding [1, 4, 10, 6, 14]. The use of traditional clinical and radiological diagnostic methods for nonspecific diseases is difficult, which requires the use of modern techniques and algorithms of radiation examination, such as X-ray computed tomography, X-ray digital tomosynthesis, magnetic resonance imaging, ultrasound examination and their combinations [6, 9, 11, 12].

Today, with the emergence of new non-ionizing methods of radiation diagnostics, optimization of research protocols, there is a gradual revision of approaches to examination in pediatrics. According to the WHO recommendations, magnetic resonance imaging (MRI) and ultrasonography (ultrasound) are the methods of choice for diagnostics in pediatrics [8, 7]. Ultrasound is informative in detecting inflammatory and neoplastic lymphadenopathies in the neck, in the mediastinum (endoscopic ultrasound), abdominal cavity, extremities (sensitivity for superficial lymph nodes - 71-92%, specificity - 65-94%, accuracy - up to 90%) [7, 11, 12]. It is inferior to CT and MRI in displaying the lymph nodes of the retroperitoneal space and pelvis [14, 12, 15, 9]. Fibrous lymph nodes are not visualized by ultrasound methods.

On ultrasound, enlarged lymph nodes appear as round or oblong masses with clear contours, homogeneous structure and reflections of medium intensity [7, 8, 9, 16].

## **MATERIALS AND METHODS**

The survey was carried out in two stages. At the first stage, students of grades 1- 4 (945) of secondary school No. 37 in the city of Andijan were examined. A study of the child's dental status was carried out ( hygiene index). Examination of the facial skin was carried out, regional lymph nodes were palpated, their localization, consistency, size, adhesion with the surrounding tissues were determined. Concomitant somatic diseases were taken into account on the basis of the student's medical record.

**TABLE 1**

Pupils	Diagnosis				Total
	Caries	Lymphadenopathy	Chronic tonsillitis	Healthy	
1Grade	290 (96,6%)	65 (21,6%)	20 (6,6%)	215 (71,6%)	300 (100%)
2 Grade	180 (90%)	33 (16,5%)	14 (7%)	153 (76,5%)	200 (100%)
3 Grade	200 (90,9%)	20 (9,09%)	10 (4,5%)	190 (86,3%)	220 (100%)
4 Grade	200 (88,8%)	20 (8,88%)	10 (4,4%)	195 (86,6%)	225 (100%)
Number (abs)	870 (92%)	138 (14,6%)	54 (5,7%)	753 (79,6%)	945 (100%)
Total (abs)	945 (100%)				

In the first grade, 300 pupils were examined, of which 215 (71.6%) were healthy children, 290 (96.6%) pupils were diagnosed with caries, chronic tonsillitis in 20 (6.6%) and 65 (21, 6%) lymphadenopathy.

In the second grade, 200 pupils were examined, of which 153 (76.5%) were healthy, 180 (90%) pupils had caries, chronic tonsillitis in 14 (7%) and 33 (16.5%) lymphadenopathy.

In the third grade, 220 pupils were examined, of which 190 (86.3%) were healthy, 200 (90.9%) pupils were diagnosed with caries, chronic tonsillitis in 10 (4.5%) and 20 (9.09%) had lymphadenopathy.

In the fourth grade, 225 pupils were examined, of which 195 (86.6%) were healthy, 200 (88.8%) pupils revealed caries, chronic tonsillitis in 10 (4.4%) and 20 (8.88%) lymphadenopathy.

At the second stage, the study was conducted by examination, ultrasound, cytological examination, mantoux test and laboratory tests.

**TABLE 2**

Research method	Number of surveyed pupils	Total number of pupils
Examination	945(100%)	945(100%)
USD	138(14,6%)	945(100%)
Complete blood count	945(100%)	945(100%)
Cytological	138(14,6%)	945(100%)
Mantoux test	138(14,6%)	945(100%)

In the diagnostic algorithm for conducting the surveyed, the following research methods were used (tab 2):

1. 945 pupils of different ages were examined. On examination, the height and body weight, body temperature were measured; assessed the condition of the skin and visible mucous membranes (color, pathological rashes, and formations, traces of scratches and insect bites, inflammatory changes in the mucous membranes); palpation of peripheral lymph nodes (occipital, parotid, submandibular, chin, supraclavicular, subclavian, axillary, inguinal) palpation assessed the localization, severity of edema and infiltration of soft tissues, the number and size of lymph nodes, pain and mobility, the presence of fluctuations, density, cohesion with surrounding tissues, the color of the skin over the lymph node.
2. 138 children underwent a comprehensive ultrasound examination of the lymph nodes, chest organs, abdomen, which included sonography of the liver, gallbladder, pancreas, spleen, kidneys, and intra-abdominal lymph nodes.
3. Laboratory research was carried out by 138 students, which included: a general blood test with the calculation of the leukocyte formula; general urine analysis; detailed biochemical blood test (total protein, albumin, globulin electrophoresis, total bilirubin, and its fractions, aminotransferase activity, alkaline phosphatase,  $\gamma$ -glutamyltranspeptidase, urea, creatinine, cholesterol, triglycerides, glucose); blood test for HIV, syphilis, markers of viral hepatitis B and C.
4. A cytological study was also performed on 138 students.
5. The mantoux test was performed on 138 children in order to exclude tuberculosis.

## RESULTS AND DISCUSSIONS

The survey was carried out in the city of Andijan, secondary school No. 37 and included 945 primary school students at the age of 7-11 years. nodes. Poor oral hygiene and significant dental caries were found in 870 (92%), while chronic tonsillitis was detected only in 54 (5.7%).

In our study, we developed a map of ultrasonographic diagnosis of peripheral lymph nodes, in which the following parameters were taken into account: localization of lymph nodes, number, size, shape, severity of the capsule, lymph node gate, contours, echo structure of the lymph node, echogenicity, hyperechogenic inclusions, dopplerographic signs, condition of surrounding tissues.

50 primary children with benign lymphadenopathy and 45 patients with malignant lymphomas.

Based on the ultrasound examination of the lymph nodes, different characteristics of benign and malignant processes were obtained.

The ultrasound picture of nonspecific lymphadenitis is characterized by an increase in size, oval shape, and lack of expression of the capsule, thickening of the gates of the lymph nodes, clarity and the evenness of the contours, as well as the heterogeneity of the echo structure, the presence of hyperechoic inclusions and reduced echogenicity, the blood supply to the lymph node is not recorded.

The ultrasound picture of a malignant lesion of the lymph nodes is characterized by an increase

in the size of the lymph node, irregular shape, thickening of the capsule, the number is multiple, often merging into a conglomerate, compaction of surrounding tissues, the gate of the lymph node is not determined, tuberous contours, uniformity of echostructure, reduced echogenicity, absence of hyperechoic inclusions.

In the scheme of ultrasonographic examination of peripheral lymph nodes, we used the determination of Doppler and Doppler parameters. Doppler study was carried out in the mode of color and power Doppler mapping. Doppler signs made it possible to assess: the maximum and minimum blood flow velocity and the index of peripheral vascular resistance.

Based on the Doppler data, high resistance index values were found in benign lymphadenopathies ( $-0.76 \pm 0.08$ ), and in malignant processes, low numbers of the resistance index -  $0.54 \pm 0.06$  for HL,  $0.59 \pm 0.03$  for NHL) (Fig. 3a), the accuracy of the method is 91%, the sensitivity is 92%, the specificity is 90%.

In lymph nodes with benign pathology, blood flow is rarely recorded, in 11 (22%) patients, blood flow is often recorded in malignant lymphomas, in 21 (66%) patients with Hodgkin's lymphoma and in 9 (69%) patients with non-Hodgkin's lymphomas

## CONCLUSION

The use of the developed differential diagnostic complex as a working algorithm allows timely determination of indications for excisional biopsy of peripheral lymph nodes.

The expediency of using ultrasound with color energy mapping, cytochemical and biochemical methods for differential diagnosis of peripheral lymphadenopathies.

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