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CLINICAL AND LABORATORY CHARACTERISTICS OF CHILDREN WITH ADENOID VEGETATION AND ALLERGIC RHINITIS

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Annotation

Allergic rhinitis (AR) is a pressing problem in practical healthcare, occupying one of the first places in terms of socio-economic damage [1]. The prevalence of allergic rhinitis among the population of Uzbekistan is 12-24% (across different regions of the country). Among children, this figure is 10-22%, with a tendency to increase annually. According to the WHO, allergic rhinitis affects 10-20% of the world's population, and in some countries, the figure reaches 30-40% [2].

The comorbid association between adenoid vegetation (AV) and upper respiratory tract allergy, which is called inflammation of the upper respiratory tract mucosa due to IgE-mediated hypersensitivity, has been shown in many studies [3].

Allergy is considered a risk factor for AR. However, since the clinical symptoms of AR and AR are similar, only one may be diagnosed in a patient, leading to inappropriate treatment.

The incidence of atopic diseases in children has increased in recent decades, and this increase may have contributed to the rise in the incidence of allergy-induced atopic dermatitis. The literature contains numerous studies examining the relationship between allergic rhinitis and adenoid vegetations, as well as studies demonstrating the effectiveness of antiallergic medications for adenoid vegetations [4].

Keywords

allergic rhinitis, adenoid vegetation, children.

Objective: To determine the clinical and laboratory characteristics of the course of adenoid vegetation (AV) in children with allergic rhinitis (AR).

Material and methods of research: We examined 60 children (aged 3-18 years) with adenoid vegetation. The study was conducted from 2024 to 2026 at a family clinic. Children were divided into two study groups: adenoid vegetation with allergic rhinitis (study group) (n=32) and children with adenoid vegetation only (comparison group)

(n=28). Complaints were clarified, anamnesis was collected, an ENT examination was performed, which included anterior rhinoscopy, pharyngoscopy and otoscopy, endoscopic examination using a flexible endoscope, nasal smear cytology, complete blood count, skin scarification tests, and anterior rhinomonometry. The study group included children with grades II and III hypertrophy. In our study, we used a classification of adenoid vegetations, which distinguishes three degrees of pharyngeal tonsil hypertrophy. Children with a deviated septum were not included in the study. When diagnosing allergic rhinitis, we used the 2016 ARIA classification. This classification classifies AR as intermittent and persistent based on its course, and mild, moderate, and severe based on its severity.

Results: We examined a total of 60 children with adenoid edema. All children were diagnosed with adenoid vegetation based on their complaints, medical history, and clinical and laboratory tests.

Allergy skin tests were performed on all children, which showed a positive allergic reaction in 32 of them, after which they were divided into the two groups mentioned above.

All children examined were divided by gender and age. Analysis of these data revealed that the main group of patients included children aged 3-6 and 7-10 years with almost equal frequency, while the comparison group was dominated by younger children (3-6 years).

The study of anamnestic data showed that the main group of children has a significant hereditary burden of allergies compared to the control group ($p < 0.001$). Thus, in 23 (71.8%) of the main group of patients, the parents suffered from one or another allergic disease, in particular: atopic dermatitis - 6, bronchial asthma - 3, food allergy - 5, allergic rhinitis / rhinoconjunctivitis - 5, chronic urticaria - 2, hay fever - 2. In the comparative group, this indicator was equal to 4 (14.2%), which indicates that when diagnosing AB, it is important to collect an allergological anamnesis. In addition, 48% of patients in the main group indicated a history of mixed or previously artificial feeding, which has a reliable difference from the comparison group ($p < 0.01$). Parental smoking did not show a significant difference between both groups ($p>0.05$).

Complaints from the surveyed children in both groups showed differences in some indicators.

The main symptoms of patients with AV combined with AR and the comparison group are presented in the table below (Table 1).

Table 1

Symptoms of children with AB with and without AR

Symptoms	AB+AP, n=32		AB, n=28		P
	The number of sick children with this symptom				
	Abs.	%	Abs.	%	
Difficulty breathing through the nose	30	93.75	24	85.7	p>0.05
Itchy nose	23	71.9	2	7.1	p<0.01
Paroxysmal sneezing	19	59.1	3	10.7	p<0.01
Rhinorrhea	22	68.75	8	28.5	p<0.05
Sycosis of the nasal vestibule	18	56.25	1	3.6	p<0.01
Spasmodic cough	7	21.8	1	3.6	p<0.05
Lacrimation	10	31.25	2	7.1	p<0.01
Hyposmia	19	59.1	3	10.7	p<0.01
Itching in the throat, ears	5	15.6	0	0	p<0.01
Decreased appetite	12	37.5	5	17.8	p>0.05
Pale skin	9	28.1	3	10.7	p<0.05
Nervousness, irritability	17	53.1	7	25	p<0.01
Decreased attention span (school failure)	23	71.9	9	32.1	p<0.05
Decreased quality of life	26	81.25	5	17.8	p<0.01
General weakness	8	25	8	28.6	p>0.05
Sleep disturbance	27	84.3	22	78.5	p>0.05
Headaches	15	46.8	7	25	p<0.05
Allergodermatoses	13	40.6	3	10.7	p<0.01
Weight loss	7	21.8	6	21.4	p>0.05

As the table shows, nasal breathing difficulties were observed in the majority of children examined in both groups; no significant differences were found. It should be noted that the main group of patients had predominantly allergic complaints ($p<0.01$), decreased olfactory function ($p<0.01$), and asthenovegetative syndrome, indicating a more severe course of AB with AR.

Complaints of children in the main group about abundant mucous-watery discharge from the nose, sycosis of the nasal vestibule, decreased quality of life according to parents in the form of decreased concentration, rapid fatigue, and lagging behind in school performance revealed reliable differences compared to the control group ($p < 0.05$), judging by which it can be concluded that adenoid vegetation combined with allergic rhinitis has a more severe course compared to the control group of patients.

Anterior rhinoscopy significantly more frequently revealed hyperemia and swelling of the inferior and middle turbinates, muco-watery nasal discharge, and a bluish/hyperemic nasal mucosa ($p < 0.001$). Flexible endoscopy was used to diagnose grade II or III pharyngeal tonsil hypertrophy, which led to a diagnosis of adenoid vegetation.

Endoscopic examination revealed that in the main group of patients, grade III hypertrophy of the pharyngeal tonsil was more common than in the comparative group ($p <0.05$).

Using the nasal smear method, the counts of neutrophils, eosinophils, lymphocytes, and monocytes were determined. The percentage of each cell type was calculated. The cellular composition of nasal smears in the study group was characterized by a significant increase in eosinophils and a decrease in lymphocytes and monocytes, suggesting a reduced local immune response in children in the study group.

Analysis of the obtained scratch tests revealed positive results in 16 of the 34 children examined, allowing us to divide our patients into study groups. The majority of those examined in the main group (59.4%) tested positive for house dust mites (D. pteronyssinus or D. farinae), animal dander, pillow feathers, cockroaches, histamine, cotton, and fungi. Based on this, they were diagnosed with persistent AR. The remaining

children tested positive for pollen (40.6%), indicating intermittent AR. Table 2 presents data on AR severity.

Table 2

Distribution of patients in the main group according to the ARIA classification

Severity	Persistent		Intermittent	
	n=19	%	n=13	%
Easy	8	42	5	38
Average	9	48	4	31
heavy	2	10	4	31

A complete blood count showed significant differences between the main and comparative groups in the number of eosinophils, which exceeded normal levels by several times ($p<0.001$).

Among the pediatric patients examined, the incidence of eustachitis, rhinosinusitis, and simple chronic tonsillitis was higher in the study group than in the comparison group ($p < 0.05$). It should be noted that patients with toxic-allergic chronic tonsillitis were not included in the study.

X-ray examination of the paranasal sinuses in the main group showed proliferative changes in 12 children (in the ethmoid sinuses - in 6 patients, ethmoid and maxillary sinuses - in 4, only in the maxillary sinuses - in 2), no significant differences were found between the comparison group ($p> 0.05$).

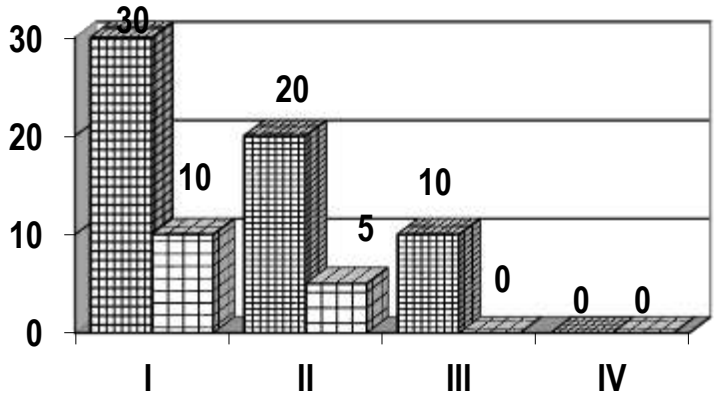


Diagram 1. Olfactory function in children with AB combined with and without AR

The results obtained from the olfactory function assessment are presented in the diagram. It is evident that the number of patients with grades I-III hyposmia differed

significantly between the two groups. Thus, AR has a significant impact on olfactory function in patients with AA.

Difficulties in diagnosing pathologies of the intranasal structures that lead to obstructed nasal breathing have led to the development of advanced diagnostic methods that objectively assess the condition of the nasal cavity based on multiple parameters. These diagnostic methods include anterior active rhinomanometry (AAR).

The use of this device has opened up new possibilities in the study of nasal cavity pathology, possessing such qualities as: speed of testing, electronic accuracy, simplicity, non-invasiveness, high objectivity and the ability to be used for diagnostics of all age groups of the population, including infants.

The PARM test is based on the physical law of air flow through a tube from an area of higher pressure to an area of lower pressure. Air resistance is determined by changes in airflow and pressure. During the respiratory cycle, the pressure in the nasopharynx changes relative to atmospheric pressure due to negative suction pressure in the chest. This causes airflow from the nasal cavity to the lungs. Airflow velocity is determined by the pressure gradient, the size and length of the nasal cavity, and the nature of the airflow—laminar or turbulent. The device takes measurements at a standard pressure of 150 Pa.

During anterior rhinomanometry, the total airflow volume and resistance were measured, as well as the parameters for each half of the nasal cavity at a pressure gradient of 150 Pa, since at this pressure, nasal flow becomes maximally laminar. Simultaneously, the RINOLAN device performed rhinoresistometry, calculating nasal resistance values at a volumetric flow rate of 250 ml/s. The RINOLAN software calculated and recorded the aerodynamic parameters for each half of the nasal cavity, as well as the total parameters.

During objective assessment of nasal breathing function in the main group of patients, the average total nasal resistance with PARM was 0.8±0.5 cPa/ml during inhalation and 0.7±0.4 cPa/ml during exhalation, while the total volumetric nasal flow rate was within the range of 288±178 ml/s during inhalation and 270±134 ml/s during exhalation. The above-mentioned rhinomanometry parameters corresponded to a

pronounced degree of nasal obstruction. It should be noted that the analysis of average PARM parameters was performed for both the right and left halves of the nasal cavity; in the inhalation and exhalation phases, we did not find statistically significant differences ($p > 0.05$) between the values of nasal resistance and volumetric nasal flow recorded in the right and left halves of the nose.

When examining the comparison group – with PARM, the results obtained did not differ significantly ($p>0.05$).

In conclusion, it can be concluded that adenoid vegetation with allergic rhinitis has a complicated anamnesis and a more severe clinical course than adenoid vegetation without allergic rhinitis, which dictates timely diagnosis and the choice of the correct tactics for further treatment.

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