

## Features of physical development of preschool children with allergic diseases

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**Abstract.** Physical development is one of the main indicators of the health of the child population. Based on the results of studies of indicators of physical development, it is possible to obtain objective and reliable information about the state of health of children. If these studies are carried out in dynamics, then it is possible to make a scientifically grounded forecast regarding the state of health of children in the future. This information is of great scientific and practical importance for theoretical and practical medicine. The scientific significance of research devoted to the problem of physical development has especially increased in recent years. The fact is that the acceleration process, according to the literature of recent years, has significantly slowed down or even stopped. In this regard, it is necessary in new studies to clarify other aspects of this problem: Comprehensive study of the epidemiology of allergy in children. Clarification of the degree of influence of environmental factors on the physical development and health of children. Social and hygienic living conditions have a significant impact on the indicators of physical development and health status of children. Determination of the relationship between the interdependence of physical development and functional reserves of the body. Elucidation of the nature of the influence of various diseases on the physical development and health of children.

### 1 Introduction

The state of physical development of children suffering from allergic rhinoconjunctivitis. To identify persons suffering from allergic rhinoconjunctivitis (ARC), children living in the Yunusabad district of Tashkent city were examined and examined. After a thorough clinical and allergic examination. 58 children with ARK were selected for further observation and research. The age of patients varied from 3 to 6 years, including at the age of 3 years - 16 (27.6%), 5 years - 13 (22.4%). 6 years - 14 (24.1%). Among the selected children, there were 33 boys (56.9%), and 25 girls (43.1%). The number of children in age groups and the ratio of boys and girls were approximately the same (Table 1.1).

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Our studies have shown that the predominant symptoms in sick children were diffuse itching, burning in the nose and nasopharynx, rhinorrhea and paroxysmal sneezing, poor sleep, irritability, difficulty breathing through the nose, and general weakness.

**Table 1.1.** Distribution of children with ARC by sex and age (n = 58).

Age, years	number of observed children					
	Boys		Girls		Both sexes	
	abs	%	abs	%	abs	%
3	9	15.5	7	12.1	16	27.6
4	8	13.8	7	12.1	15	25.9
5	8	13.8	5	8.6	13	22.9
6	8	13.8	6	10.3	14	24.1
Total:	33	56.9+6.5	25	43.1+6.5	58	100.0

Examination of the nose showed swelling of the mucous membrane. Tire color of the mucous membrane was white, blue or gray. Nasal discharge was mucous, serous. Tire disease was clearly seasonal. Exacerbation of symptoms was often noted during the springsummer or summer-fall season. Tire duration or duration of the disease ranged from several months to 5 years or more (Table 1.2).

**Table 1.2.** Duration (duration) of illness in children with ARK (n = 58).

Duration of illness	number of observed children					
	Boys		Girls		Both sexes	
	abs	%	abs	%	abs	%
Up to 2 years	15	25.9	13	22.4	28	48.3+6.6
3-5 years old	10	17.2	8	13.8	18	31.0+6.1
Over 5 years	8	13.8	4	6.9	12	20.7+5.3
Total:	33	56.9	25	43.1	58	100.0

Tire analysis showed that the duration of the disease up to 2 years was in 28 (48.3%) patients, from 3 to 5 years - in 18 (31.0%), over 5 years - in 12 (20.7%). Consequently, the vast majority of 46 (79.3%) patients suffered for a long period. This, naturally, negatively affected the growth and development and other indicators of children's health.

It is of interest to analyze the results regarding the age of children at which the first symptoms of the underlying disease appeared. In most patients, the first symptoms of the underlying disease appeared at the age of 2-3 years - 33 (56.9%), which indicates that many patients suffered from ARC for a long period of time (Table 1.3).

**Table 1.3.** Age of children at which the first symptoms of ARC appeared (n = 58).

Age, years	number of observed children					
	Boys		Girls		Both sexes	
	abs	%	abs	%	abs	%
2-3	12	20.7	21	36.2	33	56.9+6.5
4-5	10	17.2	15	25.9	25	43.1+6.5
Total:	22	37.9	36	62.1	58	100.0

Literary data indicate that in recent years, cases of combined forms of allergy have become more frequent. Our data also showed that ARA was often combined with other allergic

reactions. The most frequent combination was with drug allergy - in 24 (41.4%), atopic dermatitis - in 20 (34.5%) and food allergy - in 14 (24.1%) (Table 1.4). Combined forms of allergy are distinguished by their chronic course, frequent exacerbations.

**Table 1.4.** Distribution of children with ARC by sex and age (n = 58).

Allergies combined	Frequency combinations					
	Boys		Girls		Both sexes	
	abs	%	abs	%	abs	%
Medicinal	12	20.7	12	20.7	24	41.4+6.5
Atopic dermatitis	12	20.7	8	13.8	20	34.5+6.2
Food	9	15.5	5	8.6	14	24.1+5.6
Total:	33	56.9	25	43.1	58	100.0

In the mechanism of the formation and development of allergic diseases, including ARA, risk factors are essential. According to our data (Table 1.5), in general, genetic factors occurred in 36 (62.0%) patients, allergic diathesis - in 45 (77.6%), focal infections - in 43 (74.1%), artificial feeding in the first year of life - in 47 (81.0%).

**Table 1.5.** The incidence of risk factors in the development of ARC in children (n = 58).

Occurrence factors risk	Frequency combinations					
	Boys		Girls		Both sexes	
	abs	%	abs	%	abs	%
Genetic	20	34.5	16	27.6	36	62.1+6.4
Allergic diathesis	25	43.1	20	34.5	45	77.6+5.5
Focal infections	24	41.1	19	32.8	43	74.1+5.7
Artificial feeding	28	48.3	19	32.8	47	81.0+5.1

The study of physical parameters (length of height, body weight and chest circumference) showed the following results (Table 1.6, Figure 1.1, Figure 1.2 and Figure 1.3). To judge the shifts in anthropometric indicators under the influence of various risk factors and the allergic process, we carried out a comparative analysis of them with the ready-made standards for the physical development of children in the Tashkent region, developed by other scientific institutions of the country.

When comparing anthropometric indicators with the standards developed by the Research Institute of Pediatrics, children with ARC showed a significant (P<0.001) lag in physical growth and development. So, growth rates were lower than similar indicators of the standard (Table 1.7) for boys by 7.7-17.9%, and for girls - by 7.3-11.5% (Figure 1.1). Body mass indicators were lower than similar indicators of the standard for boys by 16.0-27.9%, and for girls - by 15.1-26.4% (Fig. 1.2). Chest circumference indicators were 2.4-4.1% lower than those of the standard for boys, and 2.0-3.3% for girls (Figure 1.3).

**Table 1.6.** Indicators of physical development of children with ARC (n = 58).

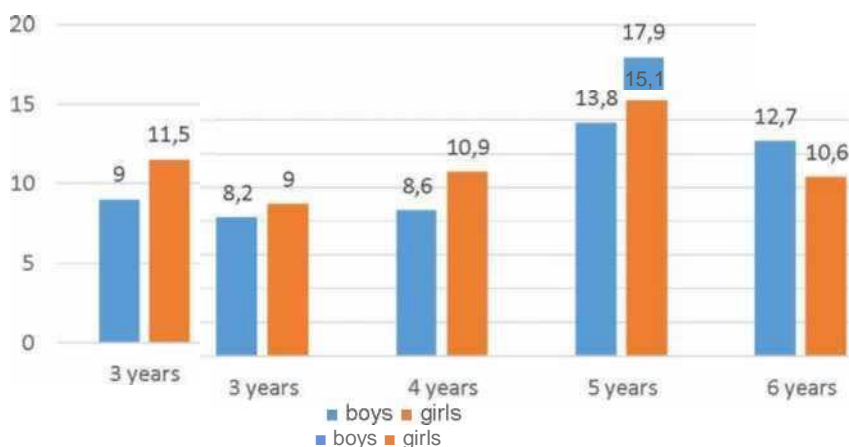
Age, years, gender	Body length (cm)	Body weight (kg)	Chest circumference (cm)	
3	Boys	85.1+4.9***	12.5+0.37***	50.8+0.40***
	Girls	82.3+3.39**	12.6+0.21***	50.7+0.18***
4	Boys	87.8+2.64***	12.9+0.53***	53.1+0.30**
	Girls	86.1+2.79***	12.9+0.57**	52.7+0.18***
5	Boys	103.1+1.62***	14.7+0.36***	53.8+0.30**
	Girls	98.8+1.46***	15.0+0.71**	54.8+0.20***

6	Boys	97.5-+3.39***	15.9-+0.47***	54.2-+0.25***
	Girls	102.3-+2.58***	16.3-+0.98**	56.4-+0.33**

Note: \* - reliable in comparison with the data of practically healthy children (\* -P <0.05; \*\* - P <0.01; \*\*\* -P <0.001)

**Table 1.7.** Indicators of physical development in practically healthy children (according to the standard).

Age, years, gender		Body length (cm)	Body weight (kg)	Chest circumference (cm)
3	Boys	92.8+0.06	14.5-+0.2	52.9-+0.4
	Girls	91.8-+0.08	14.5-+0.08	52.0-+0.08
4	Boys	98.0-+0.08	16.5-+0.2	54.4-+0.4
	Girls	96.0-+0.08	16.3-+0.9	54.0-+0.08
5	Boys	111.0-+0.08	18.2-+0.18	55.5-+0.4
	Girls	106.0-+0.08	18.0-+0.8	56.0-+0.08
6	Boys	115.0-+0.08	19.8-+0.19	56.0-+0.4
	Girls	114.0-+0.08	20.0-+0.8	57.5-+0.08



**Fig. 1.1.** Average indicators of growth retardation in children with ARC (n = 58).



**Fig. 2.1.** Average indices of lag in the development of body weight in children with ARC (n = 58).

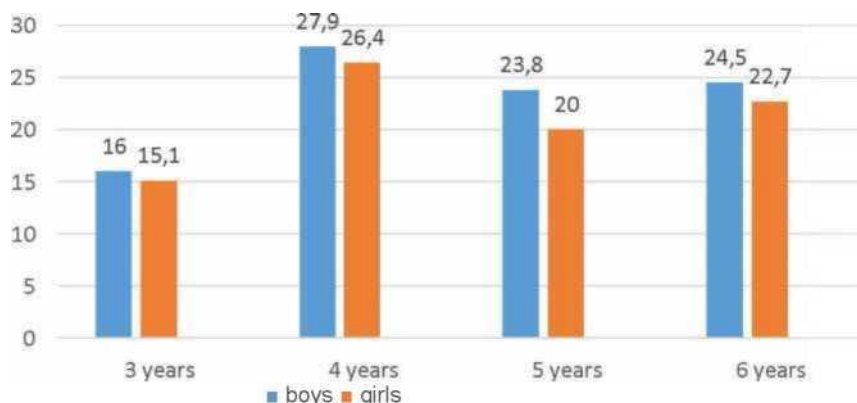


Fig. 3.1. Average indices of developmental lag in the chest circumference in children with ARC (n = 58).

## 2 Materials and methods

The object of the study was children attending kindergartens and schoolchildren living in the conditions of Tashkent. There were 205 sick children of preschool age (3 -6 years old) under observation: boys-117, girls-88; 271 children of school age (7-14): boys - 141 (52.0%), girls - 130 (48.0%) and 50 practically healthy children of the corresponding age and gender. Preschool children attended one of the kindergartens in the Yunusabad district and school-age children studied in schools in the same district of Tashkent. Children have permanently lived in the city of Tashkent for at least 5 years.

Determination of the main anthropometric parameters of the body

The main anthropometric parameters of the body (body length and weight, chest circumference) were determined by measuring them in a generally accepted way. The assessment of the physical development of the examined sick children was carried out in comparison with similar indicators of physical development obtained in practically healthy (control 1) and with the standards of indicators of the physical development of children permanently residing in the regional conditions of the Tashkent region (control 2).

Specific diagnosis of allergies in children

Specific diagnostics of allergic diseases was established on the basis of a comprehensive clinical-allergic, functional, laboratory examination of patients and the setting of specific allergic diagnostic tests (in vivo), taking into account the International Consensus.

When collecting an allergic anamnesis, attention was paid to the history of the development of the main and concomitant diseases, the presence of a connection between the symptoms of the disease and the intake of certain medications. We found out the presence of allergic diseases in the closest relatives (mother, father, grandmother, grandfather), that is, hereditary burden. The state of health of the mother of a sick child during pregnancy (toxemia, pathological childbirth, etc.) and the nature of the child's nutrition in the first year of life after birth (natural, artificial, previously mixed) were clarified. We found out and took into account the peculiarities of the child's reaction to preventive vaccinations, as well as the living conditions of sick children.

The diagnosis of allergic rhinitis (AR) was made on the basis of modern criteria set forth in the European International Competition (2000) on AR with the advice of an otorhinolaryngologist.

The diagnosis of bronchial asthma (BA) was made according to the recommendations of the National Institute "Heart, Lungs, Blood" WHO and the national program "Treatment and prevention of bronchial asthma in children and adults of the Ministry of Health of the Republic of Uzbekistan"

The diagnosis of atopic dermatitis (AD) was made with the advice of a specialist dermatologist in accordance with the criteria generally accepted in modern dermatology (12): itching of the skin, typical morphology and localization of skin rashes, chronic recurrent course, atopy in history or hereditary predisposition to atopy eosinophilia of the blood.

The diagnosis of allergy of the gastrointestinal tract (GIT) was made with the advice of a specialist gastroenterologist, using the Sydney classification. The presence of gastrointestinal allergy was determined on the basis of the presence of hyperacidity of the stomach, hyperergic reactivity of parietal cells of the stomach, hyperduodinitis.

#### Allergy skin tests

When setting allergic skin tests, all the necessary precautions were observed: taking into account indications and contraindications, the need to set two controls (saline or extracting liquid and histamine), the presence of a set of anti-allergic and anti-shock drugs, etc. Skin allergic tests were given to school-age children.

The results of allergic reactions were assessed in a generally accepted way (tables 2.1 and 2.2).

**Table 2.1.** Scheme for recording scarification allergic reactions.

No	Skin appearance and blister size	Assessment of reactions
1	Hyperemia, no blister	Negative (-)
2	Hyperemia, no edema at the site of scarification	Doubtful (_ +)
3	Hyperemia, blister 2-3 mm	Weakly positive (+)
4	Hyperemia, blister 4-5 mm	Positive (++)
5	Hyperemia, blister 6-10 mm	Strong positive (+++)
6	Hyperemia, blister more than 10 mm with pseudopodia	Very sharp degree of positive reaction (++++)

**Table 2.2.** Scheme for recording intradermal allergic reactions.

No	Skin appearance and blister size	Assessment of reactions
1	Skin reaction is the same as in control	Negative (-)
2	The blister dissolves more slowly than control	Doubtful (_ +)
3	Blister 4-8 mm surrounded by erythema	Weakly positive (+)
4	Blister 8-12 mm surrounded by erythema	Positive (++)
5	Blister 12-18 mm surrounded by erythema	Strong positive (+++)
6	Blister more than 18 mm with pseudopodia, additional blisters around the periphery and bright	Very sharp degree of positive reaction

erythema	(++++)
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### 3 Functional research methods

A peakfluometer was used to determine bronchial patency. Peakfluometer readings are determined in 1 / s.

### 4 Laboratory research methods

General analysis of blood, urine, feces and sputum of the patient was carried out by generally accepted methods. Statistical processing of the obtained data.

The obtained data were subjected to statistical processing on a personal Pentium-4 using programs developed in the EXCEL package, using a library of statistical functions, with the calculation of the arithmetic mean (M), standard deviation, standard error (m), relative values (frequency.%). Student's test (t) with the calculation of the error probability (P). Differences in mean values were considered significant at a significance level of  $P > 0.05$ . At the same time, the existing guidelines for the statistical processing of data from clinical and laboratory studies were adhered to. Amount of work performed

**Table 2.3.** Amount of work performed.

No	The nature of the work	number
1	Clinical and allergological examination of preschool children suffering from:	
	- allergic rhinoconjunctivitis	58
	- allergic recurrent obstructive bronchitis	50
	- bronchial asthma	32
2	- gastrointestinal allergy	65
	Clinical and allergological examination of school-age children suffering from:	
	- allergic rhinoconjunctivitis	114
	- allergic recurrent obstructive bronchitis	84
3	- bronchial asthma	73
	Determination of the parameters of the physical development of preschool children suffering from:	
	- respiratory allergies	140
4	- gastrointestinal allergy	65
	Determination of the parameters of the physical development of school-age children suffering from:	
	- allergic rhinoconjunctivitis	114
	- allergic recurrent obstructive bronchitis	84
5	- bronchial asthma	73
	Determination of specific allergic reactivity in schoolchildren with respiratory allergies:	
	- determination of the frequency of positive reactions to regional non-infectious allergens (pollen, dust, epidermal, insect)	271
	- determination of the severity (intensity) of the inflammatory reaction of the skin to non-infectious allergens	271
	- determination of indicators of allergometric titration for regional allergens	271

### 5 Results

The reason for the lag in the physical development of preschool children is obviously associated with the negative impact of ARC on their health. According to the anamnesis, the first symptoms of the disease in sick children appeared at the age of 3-4 years, the disease often acquired a chronic course. Risk factors were also of significant importance: hereditary burden, artificial or previously mixed feeding in the first year of a child's life, the presence of chronic focal infections, as well as the pathology of pregnancy of mothers of sick children. It is impossible to exclude the development of polysensitization and the frequent combination of the underlying disease with other allergic reactions and diseases.

## 6 Discussions

Thus, conducting a comprehensive clinical, allergic examination of 58 sick preschool children suffering from allergic rhinoconjunctivitis, determining some parameters of the physical development of children, the following facts were established:

In children suffering from allergic rhinoconjunctivitis, there is a lag in physical development, which manifests itself in the presence of a deficit in body length and weight, as well as chest circumference.

Allergic rhinoconjunctivitis, which lasts for a long time and negatively affects the health of children, plays a significant role in the complex of reasons that are important in the lag in the physical development of preschool children. To ensure the normal development of the physical parameters of preschool children in the complex of measures, it is necessary to include the timely recognition and treatment of allergic diseases in general and allergic rhinoconjunctivitis in particular.

## 7 Conclusion

Analysis of modern literature has shown that the problems of the influence of various exogenous and endogenous factors on the physical development of children are being intensively studied by researchers from various positions. However, the issues related to the influence of various diseases, especially allergic ones, on the physical development of children are not sufficiently covered in the literature. There is no scientifically substantiated information regarding the peculiarities of allergies in children with different levels of physical development and living in different environmental conditions. We have studied the issues of the negative impact of some allergic diseases on the physical development of preschool and school children.

140 children aged 3-6 years were under observation, including 77 boys (55.0%), and 63 girls (45.0%). Children permanently lived in Tashkent, for at least 5 years, and attended one of the kindergartens of the Yunusabad district of Tashkent. The clinical forms of manifestation of respiratory allergies were different: allergic rhinoconjunctivitis - 58 (41.4%), allergic recurrent obstructive bronchitis - 50 (35.7%), bronchial asthma - 32 (22.9%). The first symptoms of the disease appeared in 2-3 years in the majority of patients - 80 (57.1%). The duration of illness in the majority of patients - 82 (58.6% - + 4.1%) was within 5 years and more. One of the most important features of allergic diseases is the combination of the underlying disease with other allergic reactions and diseases. When analyzing the data, it turned out that the underlying disease was combined with other allergic reactions and diseases with different frequencies: food allergy - 60 (42.8%), atopic dermatitis - 47 (33.6%), drug allergy - 33 (23.6%).

Exogenous and endogenous risk factors were of great importance in the development of allergic respiratory diseases. Among them, a special place was occupied by hereditary burden. According to our data, genetic factors were important in 67.4% of cases. The



predisposition to allergies was most often transmitted through the female line (76.4%). Allergies were inherited less frequently in the male line (23.6%). Clinical forms of allergic diseases in close relatives did not always coincide with allergies in children. Uris fact indicates that it is not an allergic disease as such that is inherited, but the body's predisposition to allergies in general. In addition, such risk factors as allergic diathesis (72.7%), focal infections (78.0%), artificial and (or) previously mixed feeding (83.3%) were also important.

With regard to the influence of respiratory allergic diseases on the physical development of preschool children, it was possible to find out the following.

In children with respiratory allergies, there was a significant ( $P < 0.001$ ) lag in height (body length), body weight (weight) and chest circumference. So, in children of all studied age groups (3-6 years old), both boys and children, there was a deficit in body length compared to similar indicators of the standard, on average in boys by 8.2-13.8%, and in girls - by 9.0-15.1%. underweight in boys - by 7.4-27.7%. and in girls - by 8.2-24.1%. chest deficit in boys - by 2.64.1 %, and for girls - by 2.7-4.9%.

Among the factors that negatively affect the physical development of children, great importance is attached to the pathology of the digestive system. In this regard, it was of certain scientific and practical interest to determine the influence of gastrointestinal allergy (GIT) on the physical development of preschool children.

65 sick children aged 3-6 years with AP of the gastrointestinal tract were under observation: 40 boys (61.5%), 25 girls (38.5%). It turned out that AP of the gastrointestinal tract is clinically manifested in the form of chronic gastroduodenitis-29 (44.6%), dysfunction of the biliary tract - 21 (32.3%), chronic gastritis -9 (13.8%), chronic enterocolitis-6 (9, 2%). Both in boys - 30 (46.2%), and in girls - 20 (30.7%), chronic gastroduodenitis and biliary dysfunction prevailed. Tire duration of the illness ranged from several months to 6 years. In the majority of patients, 47 (66.1%), the duration of the disease ranged from 3 to 6 years, including in 25 (38.5%) boys and 18 (27.7%) girls.

It turned out that the first symptoms of the disease appeared during the first 12 months of life afterbirth in 44 (67.7%) patients.

Tire symptomatology of AP of the gastrointestinal tract was varied. Tire predominant symptoms of AP of the gastrointestinal tract were: pain in the epigastric region - in 47 (72.3%) patients, flatulence - in 33 (50.7%), etc.

Risk factors were of great importance in the formation of AP of the gastrointestinal tract. Hereditary burden was observed in 40 (61.5%) patients. In most cases, heredity was aggravated in the female line (mother, grandmothers) - 27 (67.5%), while in the male line (father, grandfather) - in 13 (32.5%). Conscqcntln in the female line, the hereditary predisposition to AP of the gastrointestinal tract was transmitted 2 times more often ( $P < 0.05$ ). Ure closest relatives suffered from various allergic diseases. For example, the mother or father suffered from bronchial asthma, hay fever, atopic dermatitis and other allergic diseases.

Among the risk factors, great importance is attached to the nature of the nutrition of children in the first year of life. According to our data, artificial and (or) previously mixed feeding was observed in 46 (70.8%) patients.

AP of the gastrointestinal tract was often combined with food allergy - in 18 (27.7%) and atopic dermatitis - in 10 (15.4%), and less often with respiratory allergy and drug allergy - in 5 (7.7%) patients. In general, the combination of AP of the gastrointestinal tract with other allergic reactions and diseases was 39 (60.0%) patients. A comparative analysis of our data with similar literature data convincingly indicates the presence of features of the gastrointestinal tract AP.

In practically healthy children 3-6 years of age, body length indicators were: for boys - 92.5 + 0.56-118.2- + 0.60 cm and for girls - 90.0 + 0.93-115, 0- + 0.89 cm body weight

for boys - 14.4- + 0.17-20.0- + 0.68 kg, and for girls - 14.3- + 0.33-19.6- + 0.56 kg, chest circumference for boys - 50.9- + 0.48-55.7- + 0.21 cm, for girls - 52.6- + 0.51-56.9- + 0.30 cm. These indicators did not differ significantly ( $P > 0.05$ ) from similar indicators of the standard established for children (preschool age) living in the regional conditions of the Tashkent region. In children (both boys and girls) suffering from AP of the gastrointestinal tract, a significant ( $P < 0.05$ ) deficit in growth (body length), body weight and chest circumference was observed.

In children with gastrointestinal tract AP, there is a growth deficit on average in boys of 8.2- 13.8%, and in girls - 9.0-15.1%. The body weight deficit averaged 7.4-27.7% in boys, and 8.2- 24.1% in girls. The chest circumference deficit averaged 2.6-4.1% in boys, and 2.7-4.9% in girls.

There was a certain pattern associated with the age of the patients. The deficit in height and body weight was minimal (8.2-9.0%) in children of 3 years of age and maximum (13.8-15.1%) in children of 5 years. The chest circumference deficit was minimal (2.6-2.7%) and did not depend on the age and gender of the children.

In the mechanism of occurrence of AP of the gastrointestinal tract, the development of allergic inflammation on the surface of the mucous membrane of the gastrointestinal tract (GIT) is of decisive importance, which leads to a significant violation of the secretory, absorption, endocrine and evacuation functions of the gastrointestinal tract. It is impossible to exclude the excessive action of hydrochloric acid, bile acids, pepsin, etc., which leads to the destruction of the intestinal cytoprotection system, increased penetration of allergic structures into the internal environment of the body.

After conducting a comprehensive clinical and allergic examination of 271 school-age children (7-14 years old), among them 141 boys (52.0- + 3.0), 130 girls (48.0- + 3.0) suffering from allergic rhinoconjunctivitis (31.0%), bronchial asthma (26.9%), established the features of the clinical course of these diseases and determined their negative impact on the physical development of the body.

According to our data, in the majority of patients - 148 (54.6%), the first symptoms of the disease appeared at an early (2-6 years) age.

The main diseases in general were combined with other allergic reactions in 199 (71.4%) cases. A frequent combination was observed with drug allergy - in 83 (30.6%), atopic dermatitis - in 68 (25.1%) and food allergy - in 48 (17.7%) patients. Of the risk factors in general, genetic factors were important in 197 (72.7%) patients, allergic diathesis - in 194 (71.6%), focal infections - in 190 (71.6%), artificial feeding in the first year of life - in 225 (83.0%).

As you know, there are predisposing, causal (sensitizing), contributing triggers that exacerbate the symptoms of the underlying and concomitant diseases.

According to our data, the genetic predisposing factor was of decisive importance, since the frequency of occurrence of this factor was in the range of 64.9-79.7%. Allergic diathesis (65.4-74.5%), focal infections (65.8-75.3%), artificial feeding in the first year of a child's life (80.8-84.5%) were also of significant importance.

In children with respiratory allergies, there was a noticeable lag in physical growth and development.

So, growth rates (body length) were lower than similar indicators of the standard, on average, for boys - by 8.2-13.8%, and for girls - by 9.0-15.1%. Body mass indicators were also lower than similar indicators of the standard in boys - by 7.4-27.7%, and in girls - by 8.2-24.1%, chest circumference indicators in boys - by 2.6-4.1%, and for girls - 2.7-4.9%.

The reason for the lag in the physical development of school-age children is obviously associated with the negative impact of respiratory allergies on their general health. According to the anamnesis, the first symptoms of the disease appeared at the age of 4-6 years. The disease often became chronic. Hereditary burden, artificial and (or) previously

as the pathology of pregnancy in mothers of sick children, polysensitization and frequent combination of the underlying disease with other allergic reactions and diseases were of significant importance in the development of the disease.

To study the effect of respiratory allergies on the physical development of school-age children, 271 patients aged 7-14 years were under observation, including 141 boys (52.0%), 130 girls (49.0%). The children suffered from the main three clinical forms of respiratory allergies: allergic rhinoconjunctivitis (42.1%), allergic recurrent obstructive bronchitis (31.0%), bronchial asthma (26.9%). In the majority of patients - 148 (54.6%), the first symptoms of the disease appeared at an early (2-6 years) age, the underlying disease as a whole was combined with other allergic reactions in 199 (73.4%) cases. A frequent combination was observed with drug allergy - in 83 (30.6%), atopic dermatitis - in 68 (25.1%) and food allergy - in 48 (17.7%) patients. In the mechanism of the formation and development of allergic diseases, genetic factors were of significant importance in 197 (72.7%) patients, allergic diathesis - in 194 (71.6%), focal infections - in 190 (71.6%), artificial feeding in the first year of life - in 225 (83.0%). A genetic factor was of decisive importance, since the frequency of occurrence of this factor was in the range of 64.9-79.7%. Allergic diathesis (65.4 - + 5.1-74.5 - + 4.0%) - focal infections (65.8-75.3%), artificial feeding in the first year of a child's life (80.8-84.5%), which is consistent with the literature data.

In our studies, growth rates were lower than similar indicators of the standard, on average, for boys by 8.3-10.9%, and for girls - by 9.8-11.2%. Body mass indicators were lower than similar indicators of the standard: for boys by 20.9-35.4%, and for girls - by 25.1-40.5%. Indicators of chest circumference were lower than similar indicators of the standard: for boys by 12.9-20.5%, and for girls - by 15.4-20.8%.

Respiratory allergies negatively affect the formation of the physical development of children. According to the anamnesis, the first symptoms of the disease in children appeared at the age of 4-6 years. The disease often became chronic.

In recent years, the theory of the reactivity of the organism has been widely developed. Determination of the allergic reactivity of the patient's body is of great practical importance. In this regard, there is a natural need for detailed studies related to clarification of the characteristics of the body's allergic reactivity in various diseases.

A comparative analysis of the study of the specific allergic reactivity of the organism of children suffering from different clinical forms of respiratory<sup>A</sup> allergies showed the following results.

It turned out that the degree of increase in the specific allergic reactivity of the patient's body depends on the clinical form of respiratory allergies and the type of specific allergens.

So, for example, the reactivity of the organism of children suffering from ARK and AROB was the highest to allergens from pollen of wormwood (64.3-87.7%) and quinoa (53.6-72.8%). Specific heightened reactivity in children with asthma to allergens from wormwood and quinoa pollen (24.7-28.8%) was relatively low compared with the reactivity of patients with ARC and AROB.

Consequently, in the etiology of respiratory allergies in children, allergens from grass pollen were of significant importance as sensitizing factors.

The specific allergic reactivity of the children's organism to the allergen from house dust largely depended on the clinical form of respiratory allergies. The highest specific hypersensitivity of the organism was observed in children with BA (72.6%) and AROB (71.4%). The specific allergic reactivity in children with ARK to house dust allergen was relatively low (35.1%).

Hence, it is clear that in the etiology of AD and AROB in children, as a sensitizing factor, the allergen from house dust is of primary importance.

The specific allergic reactivity of the organism in children suffering from respiratory allergies to epidermal allergens, in comparison with pollen allergens, was significant ( $P < 0.05$ )

2-3 times lower. The frequency of positive scarification tests did not depend on the clinical forms of respiratory allergies and was in the range of 13.2-35.1%. In general, the patients' allergic reactivity was relatively higher to the cat hair allergen than to the dog hair allergen.

To clarify the allergic reactivity of the organism to insect allergens, the most common house dust mites *D. Pteronyssinus* and *G. Cadaverum*, most common in the region of Uzbekistan, were used. The specific allergic reactivity of the organism of children with BA was significantly ( $P < 0.05$ ) higher (63.0-65.8%) than the analogous reactivity of the organism in children with ARC. AROB (31.6-39.3% ).

An analysis of the results of the severity of allergic inflammation of the skin in children suffering from respiratory allergies also testifies to a high degree of allergic reactivity. In all patients, reactions expressed by +++ and ++++ prevailed. So, for example, in children with ARC, such reactions were found in 79.0%, with AROB - in 63.9%. BA - in 60.9% of cases.

Allergy titration indices reached high values and depended on the clinical forms of allergic diseases and the type of allergens. Thus, the indicators of allergometric titration reached  $10^{-8}$  for pollen allergens with ARC.  $10^{-6}$  for house dust allergens.  $10^{-5}$  for epidermal allergens, and  $10^{-6}$  for insect allergens. The indicators of allergometric titration in patients with AROB for pollen allergens -  $10^{-8}$  and for allergen from house dust -  $10^{-7}$ . For epidermal and insect allergens, respectively  $10^{-5}$  and  $10^{-6}$ .

In BA patients, the indices of allergometric titration reached  $10^{-8}$  for pollen allergens and house dust allergens, and  $10^{-6}$  for epidermal and insect allergens.

Thus, in all children suffering from respiratory allergies, the specific allergic reactivity was increased, along with this, it was possible to identify some features of changes in the reactivity of the body, depending on the clinical forms of respiratory allergies and the type of regional allergens. With ARA, the patient's body was more susceptible to pollen allergens. However, allergens from grass pollen played a significant role in the development of sensitization of the organism. Children with AROB were more susceptible to house dust allergen. In children with asthma, the allergic reactivity of the body to the allergen from house dust and allergens from house dust mites was 2-5 times higher than to pollen and epidermal ones. The intensity of allergic skin inflammation in most patients is quite pronounced.

## References

1. I.I. Ryumina, M.M. Yakovleva, *Rus med journal*, **19(3)**, 146-149 (2011)
2. M.M. Gubin, G.V. Azmetova, *Pharmacy*, 7, 40-48 (2008)
3. O.S. Drobik, D.S. Fomina, L.A. Goryachkina, et al., *Allergology and immunology*, **1**, 3845 (2012)
4. S.V. Morozova, *Doctor*, 9, 27-32 (2012)
5. I.V. Nesterova, *Attending physician*, 6, 26-29 (2009)
6. E.V. Nosulya, A.K. Vinnikov, I. A. Kim, *Rus. honey, zhurn.* **19(8)**, 490-493 (2011)
7. D.Y. Ovsyannikov, L.V. Pusliko, *Allergic rhinitis in children: teaching method. manual for the study of the course "Children's diseases"* (Publishing house of RUDN, M., 2012)
8. I.V. Ozerskaya, N.A. Geppe, U.S. Malyavina, *Attending physician*, 9, 17-20 (2011)
9. T.A. Filippova, A. S. Verba, *New research*, 4, 37 - 45 (2013)
10. A.V. Suizhik. *Pediatric Pharmacol* 9(4), 106-110 (2012)
11. N.P. Shabalov. *Neonatology. M. : MEDpress - inform.* 1, 640 (2019)
12. G.I. Smirnova. R.E. Rummyantsev. *Russian Pediatric Journal*. **20(3)**, 1666-172 (2017)  
DOI: 10.18821 / 1560-9561-2017-3-166-172.
13. M.B. Devorova. *Eurasian Union of Scientists*. 7(3), (2015)

14. T.I. Garashchenko, Terra Medica Nova, **2(2)**, 1014 (2009)
15. N.A. Geppe, N.G. Kolosova, Consilium Medicum. Pediatrics (application), 3, 71-74 (2012)
16. L.K. Goryainova, Polyclinic, **4(1)**, 52-57 (2011)
17. M.B. Devorova. E.A. Shomansurova. Medicus. 2, 32-34 (2019)
18. L.M. Anchieta, C.C. Xavier, E.A. Colosimo, J de Pediat. **80**, 267-276 (2004)
19. D. Zisi, A. Challa, A. Makis, Hormones, **18**, 353-363 (2019) <https://doi.org/10.1007/s42000-019-00155-z>
20. G.R. Zosky, P.H. Hart, A.J.O. Whitehouse, et al., Ann Am Thorac Soc., **11(4)**, 571-577 (2014) doi: 10.1513 / AnnalsATS.201312-423OCpmid: 24601713.
21. J. Tyrrell, R.C. Ricolunond, T.M. Palmer, et al.. Related Traits and Birth Weight. JAMA **315**,1129-1140 (2016) doi: 10.1001 /jama.2016.197