Volume 2, Issue 8, August - 2024 **ISSN (E):** 2938-3811

Web of Scientists and Scholars: Journal of Multidisciplinary Research

FEATURES OF THE PREVALENCE OF ALLERGY OF DUST AND EPIDERMAL ETIOLOGY AMONG THE CHILDREN OF THE RURAL POPULATION OF THE LIVESTOCK-BREEDING AREA

K. Kh. Abdurakhmanov
F. R. Mukhamedova
U. Zh. Makhmudova
Zh. G. Mamatkulov
Gulistan State University, Uzbekistan, Gulistan

Corresponded Author:
Abdurakhmanov Karshi Kholkhodjaevich
Candidate of Medical Sciences, Associate Professor, Head of the Department of "General Medical Sciences" of the Medical Faculty of Gulistan State University. 120100, Republic of Uzbekistan, Syrdarya Region, Gulistan City, Microdistrict 4. Tel.: +998994942961.
qarshixonxolxodjayevich@mail.ru

Abstract
In the Farish district of the Jizzakh area of the Republic of Uzbekistan, children who live among cattle are studied for the incidence of dust and epidermal allergies.
Materials and methods of the study. The prevalence of symptoms of allergic diseases was studied by the method of questionnaire screening using the adapted international ISAAC questionnaire among 1432 school-age children in two age groups - 7-8 years (parents of children were questioned) and 13-14 years (children were questioned). The work used epidemiological, allergological, immunological and statistical research methods.
Results. The paper presents data from an epidemiological study of allergic diseases in children in the Farish district of the Jizzakh region of the Republic of Uzbekistan under the ISAAC program - "International Study of Asthma and Allergy in Childhood". The true prevalence of dust and epidermal allergies among children was revealed. The risk factors for their development at different age periods were determined.
Conclusions. It has been established that among schoolchildren living in the conditions of the livestock-breeding Farish district, dust and epidermal allergies are often encountered, as well as such risk factors as hereditary burden, allergic diathesis, focal infections and artificial feeding in the first year of life.

Keywords: allergen, allergy, children, livestock, sensitization, dust, prevalence.

Introduction

The relevance of the allergy problem is explained by the steady increase in the incidence of allergic diseases in the population in all countries of the world, including Uzbekistan, an

increase in the number of cases with a more severe clinical course, great medical and social significance of allergies, and the presence of regional characteristics [2, 7].

Currently, allergology is successfully developing in many areas.

Among them, the issues of epidemiology, clinical picture, etiology and pathogenesis of allergic pathology in children are of great scientific and practical importance.

One of the relevant areas of the allergy problem is the study of the etiology of allergic diseases.

The cause of sensitization of the body are allergens of non-infectious origin.

However, many issues related to the etiology of atopic allergy remain unresolved.

For example, if the importance of pollen allergens in the etiology of hay fever has been established to a sufficient degree, this cannot be said about pollen and, especially, epidermal allergens.

Some researchers are inclined to believe that for specific diagnostics of atopic allergy of dust etiology, standard commercial allergens from house dust produced in any one country (for example, in the USA) can be used.

This possibility is allegedly explained by the lack of qualitative differences in house dust from different countries. However, there are convincing facts that refute this statement.

Moreover, it has been established that not only house dust from different countries differs in its composition and specific qualities, but also house dust from different regions of the same country [8].

One of the most important reasons for the increase in the incidence of allergic diseases among the population is urbanization.

The share of large cities increases every year. Urbanization is rapidly growing in the CIS countries as well. In this regard, Uzbekistan is no exception. The need for epidemiological studies is explained by the fact that data obtained on the basis of patients' visits to medical institutions do not correspond to the true prevalence of allergic diseases, since many patients either do not visit medical institutions at all for various reasons, or doctors themselves, also for various reasons, do not establish an accurate diagnosis of allergic diseases [10]. All this leads to an underestimation of the prevalence of allergies among the child population. In this regard, epidemiological studies conducted on the basis of expeditionary studies make it possible to obtain reliable and comparable data on the prevalence of allergy symptoms.

The purpose of the study is to study the prevalence of dust and epidermal allergies in children of the livestock population of the Farish district of the Jizzakh region of the Republic of Uzbekistan.

Materials and methods of the study. The choice of the livestock, that is, Farish district of the Jizzakh region of Uzbekistan as the object of the epidemiological study was made.

The work used epidemiological, allergological, immunological and statistical research methods.

The prevalence of AD symptoms was studied by the method of questionnaire screening using the adapted international ISAAC questionnaire among 1432 school-age children in two age groups - 7-8 years old (parents of children were questioned) and 13-14 years old (children were

questioned). In accordance with WHO recommendations, the study was based on the ISAAC epidemiological methodology for studying asthma and allergies, which is currently the world standard for studying the epidemiological and clinical manifestations of bronchial asthma, allergic rhinitis and atopic dermatitis in the pediatric population.

We surveyed 1,432 children aged 7-8 and 13-14 years. The first age group (7-8 years) included first-graders, the second (13-14 years) - eighth-graders.

At the second stage of the study, clinical and allergological examinations were conducted for those schoolchildren who showed allergy symptoms at the first stage.

To clarify the regional characteristics of the clinical course of allergic diseases in children, 110 selected sick children suffering from various clinical forms of allergy, including bronchial asthma, allergic rhinitis, allergic dermatitis, were studied in detail. For allergy diagnostics, a standard set of non-infectious allergens was used: pollen (tree pollen - alder, birch, oak, poplar, plane tree; pollen of cereals and meadow grasses - timothy, orchard grass, meadow fescue, brome, bluegrass, foxtail, rye, corn; pollen of Asteraceae, Chenopodiaceae, weeds - common wormwood, ragweed, dandelion, sunflower, quinoa); household (house dust, library dust, mites - Dermatophagoides farinae, Dermatophagoides pteronyssinus and epidermal (cat, goat, sheep, dog hair), food (whole chicken egg, cod, pollock, cow's milk, etc.).

The study used allergens from the I.I. Mechnikov Research Institute of Vaccines and Serums, the State Enterprise "Allergen" (Stavropol), Sevac (Czech Republic) and Hal (Holland).

Along with endoscopy of the ENT organs, studies of the functional state of the nasal mucosa and cytological examination were carried out.

The study of the respiratory function of the nose was carried out with a rhinopneumotachometer (a PT-2 pneumotachometer with an attached nasal attachment was used).

The function of external respiration was assessed using computer spirometry on the "SPIROSIFT-3000" device (Fucuda Denshi, Japan).

The vital capacity of the lungs (VC), forced vital capacity (FVC), and forced expiratory volume in the first second (FEV1) were assessed.

The state of bronchial patency at the level of large, medium, and small-caliber bronchi was assessed by the maximum expiratory flow rate (MEF75, MEF50, MEF25).

The peak expiratory flow rate (PEF) was measured using a portable peak flow meter "Mini-Wright Peak Flow Meter" from Clement Clark International Ltd. (United Kingdom). The study of immunological reactivity was carried out by determining the content of subpopulations of immunocompetent cells (CD3+, CD4+, CD8+, CD20+) using monoclonal antibodies (MAbs) of the LT series (OOO Sorbent, Research Institute of Immunology of the Federal Medical and Biological Agency). The content of immunoglobulins A, M and G in the blood serum was assessed by the radial immunodiffusion method according to Mancini using monospecific antisera from the Moscow Research Institute of Epidemiology and Microbiology named after G.I. Gabrichevsky. The content of immunoglobulin E in the blood serum was studied using ELISA with the use of test systems of NPO "Biotechnology".

Results of the study. When analyzing the questionnaires, a history of wheezing was noted in 18.58% of schoolchildren - in 17.73% of first-graders and in 19.36% of eighth-graders.

When comparing the frequency of symptoms depending on gender, it was established that they were more frequent (1.9 times) in boys than in girls in the younger age group; in the older age group, no differences by gender were found.

In the majority (80.37%) of schoolchildren in both groups, the symptoms of wheezing were mild and rare - they recurred no more than 1-3 times a year.

However, in the older age group, according to the questionnaires, frequent (more than 12 times a year) and more severe (accompanied by speech limitation) episodes of difficulty breathing were detected 2 times more often.

Isolated night cough, occurring during a period of relative health, in the absence of symptoms of acute respiratory disease, was observed almost 2 times more often in children aged 13-14 years.

Wheezing during or after physical education classes was also significantly more often (3.5 times) observed in older children.

A study of the prevalence of AR symptoms showed that 30.03% of children had ever experienced sneezing, runny nose or nasal congestion in the absence of a cold or acute respiratory disease, somewhat more often in eighth-graders (32.02%) than in first-graders (27.68%). The presence of such symptoms in the last 12 months was noted in the questionnaires of 26.10% of children - in 29.66% of eighth-graders and in 22.26% of first-graders.

In 8.17% of children, AR symptoms were combined with conjunctivitis in the form of itchy eyes and lacrimation, and 3.15 times more often in older children. At the same time, only 3.12% of children were registered for AR - 2.97% of first-graders and 3.26% of eighth-graders.

When analyzing the block of questions aimed at identifying symptoms of AD, a positive answer to the question about the occurrence of an itchy rash in them during 6 months was received by 12.67% of children - 18.04% of 7-8 years old and 7.68% of 13-14 years old. The presence of this symptom in the last 12 months was observed in 4.48% of schoolchildren - 6.48% of first-graders and 2.33% of eighth-graders.

Symptoms of AD during the year were found 2.9 times more often in children of the younger age group.

A previously established diagnosis of AD was noted in 7.48% of children.

Thus, according to the ISAAC questionnaire, symptoms of allergic diseases (BA and/or AR, and/or AD) were detected in 47.77% of children - 45.81% of first-graders and 49.18% of eighth-graders.

At the same time, 17.33% of schoolchildren were found to have symptoms of several (2-3) allergic diseases.

The combination of symptoms of AD and AR was registered in 4.46% of schoolchildren (in 5.48% of children aged 7-8 years and in 3.73% of children aged 13-14 years), and AD and BA - in 4.87% (in 7.74 and 2.80%, respectively).

The prevalence of symptoms of AD and AR was higher in eighth-graders than in first-graders, and AD - in first-graders.

When comparing the frequency of symptoms of AD and AR obtained in our study with the data of previously conducted studies, a tendency towards an increase in the frequency of AR and its combined forms was observed.

At the second stage of the study, clinical and allergological examinations were carried out for those schoolchildren who had allergy symptoms at the first stage.

We observed 110 children suffering from atopic allergic diseases, including 61 boys (55.5%) and 49 girls (45.5%). Children suffered from various clinical forms of allergy, including allergic rhinitis – 41 (%), bronchial asthma – 37 (%),
atopic dermatitis – 32 (%) (Table 1).

Table 1. Clinical manifestations of allergic diseases in children*

№ п/п	Name of diseases	Quantity
1.	Allergic rhinitis	41 (37,2)
2.	Bronchial asthma	37 (33,6)
4.	Atopic dermatitis	32 (29)
	Total	110 (100)

***Note: percentages (%) are given in brackets**

Children suffering from allergic rhinitis complained of tickling, burning and itching in the nose, nasopharynx and throat.

Diffuse itching in the nose and nasopharynx was the most typical for most sick children.

Figure 1.

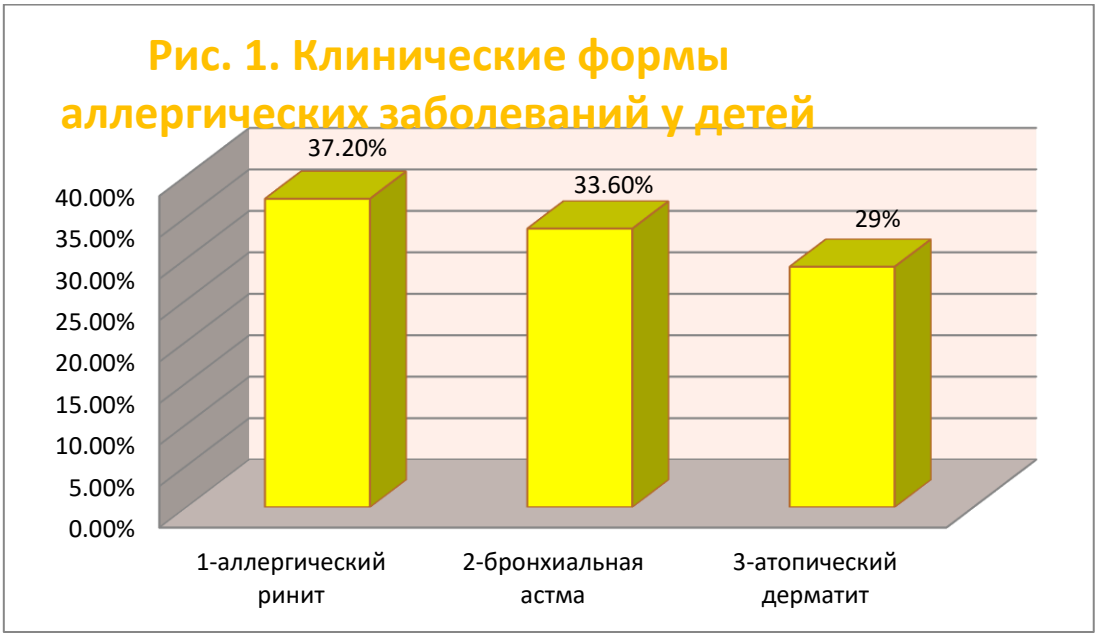

Table 2. The main symptoms characteristic of allergic rhinitis and rhinoconjunctivitis (n=28) (according to complaints and anamnesis)

№	Symptoms	Frequency of complaints (M±m%)
1.	Diffuse itching, burning in the eyes, nose, nasopharynx and throat	24 (85,7±6,6)
2	Sniffing fits	22 (78,5±7,7)
3.	Nasal congestion and difficulty breathing through the nose	17 (60,7±9Д)
4.	Rhinorrhea	14 (50,0±9,4)
5.		7 (25,0±8,1)
6.	General weakness, irritability and poor sleep	4 (14,2+6,5)
7.	Photophobia, lacrimation	2 (7,1±4,8)

Another characteristic symptom of the disease was paroxysmal sneezing. Patients complained of frequent sneezing, which sometimes had an exhausting character.

Breathing through the nose was difficult due to the development of edema and abundant discharge of mucus from the nose.

Patients were bothered by headaches, sleep disturbances. They were irritated. When examining the nasal cavity, a pale bluish color of the nasal mucosa with Voyachek spots (spasm of the vessels of individual sections of the nasal mucosa) was observed.

X-ray of the maxillary sinuses revealed thickening of the mucous membrane, especially the maxillary and ethmoid labyrinth.

However, with this form of the disease, complaints of itching, burning in the eyes and lacrimation were added.

Complaints of patients suffering from bronchial asthma depended on the period of development of the disease.

In the pre-attack period, patients were bothered by diffuse itching in the nose, nasopharynx, cough, and shortness of breath.

In the attack period, expiratory dyspnea and suffocation attacks of varying severity were more clearly observed.

The attacks of suffocation lasted from several seconds to 1 hour or more. The attacks of suffocation occurred suddenly, sometimes for no apparent reason, more often at home at night. In some children, suffocation attacks occurred when in contact with domestic animals: a cat, a dog, sheep, a goat, etc.

Pneumotachometry revealed the presence of bronchospasm. Typical attacks of suffocation were absent. Among the general symptoms, vegetative dystonia prevailed. It was noted that in 98 out of 110 patients (89%) the underlying disease was combined with other allergic diseases: allergic dermatitis, urticaria, Quincke's edema, atopic dermatitis - 48 (48.9%), allergic diathesis - 23 (23.5%), food allergy - 12 (18.4%), drug allergy - 9 (9.2%), which is characteristic of

atopic allergy. In addition, in 49 (44.5%) cases, the underlying disease was combined with other somatic diseases: pathology of the gastrointestinal tract, nervous, and cardiovascular systems.

Clarification of the role of allergens in the etiology of allergic diseases is not only of theoretical but also of great practical importance. Clarification of the cause of sensitization is important for making a specific diagnosis, as well as determining the type of allergic reactions, that is, the pathogenesis of the underlying disease.

In this regard, one of our tasks was aimed at clarifying the role of dust and epidermal allergens in the etiology and pathogenesis of atopic allergic diseases in children.

To accomplish this task, several allergy tests in vivo and in vitro were used.

The use of several allergy tests to solve one problem improves the quality of the information obtained.

First of all, patients were given skin (scarification) tests with an allergen from house dust.

The frequency of sensitization of the body of sick children to the allergen from house dust was not the same and, relatively, depended on the clinical forms of manifestation of atopic allergy. Thus, the highest frequency of sensitization of the body was in children suffering from bronchial asthma (31.4 ± 7.8%).

In second place were children suffering from allergic rhinitis (29.0 ± 8.1%).

Even lower was the frequency of sensitization of the body of children suffering from atopic dermatitis - (12.5 ± 8.2%).

In general, 29 (26.4 ± 8.1%) patients with atopy were sensitized to the allergen from house dust.

Therefore, it can be assumed that in the etiology of respiratory allergies in children, the allergen from house dust is of great importance, while in the etiology of allergic dermatitis this allergen is of lesser importance. The intensity of inflammatory skin reactions to the action of an allergen from house dust varied.

In respiratory allergies, the intensity of inflammatory skin reactions in most patients was expressed by ++ and +++, while in allergic rhinoconjunctivitis, urticaria and Quincke's edema only by + and ++. In general, in most patients - 18 (62.0%), the intensity of inflammatory skin reactions was expressed by ++ and +++. In 3 (10.3%) patients, the degree of expression of allergic skin reactions was expressed by ++++.

The most important indicator of atopic allergic diseases is hereditary predisposition.

According to our data, allergic hereditary predisposition was noted in 77 (70.0%) patients.

According to family history, hereditary predisposition was on the paternal side - in 11 (14.3%), on the maternal side - 24 (31.2%), simultaneously on the side of both parents - in 42 (54.5%).

Conclusion. The conducted epidemiological studies have shown that atopic allergic diseases of dust and epidermal etiology are not only common among the rural children of the livestock region of the Jizzakh region of Uzbekistan, but also have some regional characteristics.

The frequency of allergic morbidity in children was relatively independent of the age and gender of children and depended on the clinical forms of manifestations of diseases. Children suffered most from respiratory allergies. Exogenous factors played a significant role in the

development of atopic allergy in children: various other diseases in the anamnesis (35.9±3.0 74.7±2.7%), allergenic food products consumed by mothers during pregnancy (26.8±2.7%), toxicosis of pregnancy (68.7±2.9%), artificial or previously mixed feeding of newborns (53.3±4.3%), as well as endogenous factors - allergic burden (64.8±3.0%).

The cause of sensitization of the body were various non-infectious allergens.

The frequency of sensitization of the body depended on the clinical forms of diseases and the type of allergen. Thus, in general, the frequency of sensitization to the allergen from house dust was 40.3%, to the allergen from sheep wool - 42.2%, to the allergen from goat wool - 36.7%, to the allergen from cat wool - 12.6%, to the allergen from dog wool - 8.6%.

Another clinical feature of atopic allergic diseases was revealed: the prevalence of cases of polysensitization, that is, simultaneous increase in sensitivity to several allergens.

Thus, the problem of atopic allergy is also relevant in the regional conditions of Uzbekistan. Dust and epidermal allergens play an important role in the etiology of atopic allergy in children living in rural, especially livestock-breeding areas.

References:

1.N.CH.abdullayev Особенности клинического течения аллергии у детей микроклещевой этиологии//Современные проблемы диагностики, лечения и профилактики аллергических заболеваний. Тезислар тўплами. VII-Республика илмий-амалий анжумани материаллари.Тошкент. 2015. – с. 15-16.

2. Аллергия у детей: от теории – к практике [Текст] / под ред. Л. С. Намазовой - Барановой ; Союз педиатров России, Науч. центр здоровья детей РАМН. – Москва : Союз педиатров России, 2011. – с.667.

3. K.G.Bokidjonov Распространенность поллинозов у взрослого населения в северном Таджикистане [Текст] / Г. К. Бокиджонов, М. Н. Джураев, Н. И. Каримова // Здравоохранение Таджикистана. – 2014. – № 4 (323).с. 5– 10 .

4. A.B. Shamgunova Календарь цветения аллергенных растений Астрахани [Текст] / Б. А. Шамгунова, Л. В. Заклякова // Астраханский медицинский журнал. – 2011. – Т. 6, № 2. С.201–204.

5. E.S.Shvescova Некоторые аспекты влияния экологических характеристик на частоту и характер аллергических заболеваний населения Липецкой области / Е.С.Швецова, Н.В.Нахичеванская // Санитарный врач. – 2015. – № 10–11. С.18–21.

6. Эколого–токсикологический мониторинг воздушной среды Тюменской области и г. Тюмени / Е.М.Жиляков [и др.] // Современные проблемы науки и образования. – 2018. – № 6.

7. Эпидемиологические исследования в практике экологической медицины / В.В.Трошина [и др.] // Известия Самарского научного центра Российской академии наук. – 2014. – Т. 16.– № 5 (2). С.745–749.

8. Kh.Kh.Ernazarova Распространенность аллергических заболеваний в мире / Х.Х.Эрназарова, З.У.Адылова // International scientific review. – 2017. – № 2 (33). С,111–113.

9. R.I.Yuldashev Особенности клинического течения аллергии у детей микроклещевой этиологии. Медицина: теория и практика. Научно-практический журнал. Санкт-Петербург, №4. 2019. С.632.
10. R.I.Yuldashev, Sh. Ruziyev Региональные особенности распространения аллергии микроклещевой этиологии у детей //Педиатрия илмий-амалий журнали. -2019.№ 3/, илова№1. С.154-156.
10. Meteorological conditions, climate change, new emerging factors, and asthma and related allergic disorders. A statement of the World Allergy Organization /G. D'Amato, [et al.] // World Allergy Organ. J. - 2015. - Vol. 8, N1. - P.25.
11. Mechanistic impact of outdoor air pollution on asthma and allergic diseases / S.K. Huang [et al.] // J. Thorac. Dis. - 2015. - Vol.7, N1. - P.23-33.
12. Spergel, J.M. Epidemiology of atopic dermatitis and atopic march in children // Immunol. Allergy Clin. North Am. - 2010. – N30. - P. 269–280.
13. Stage-dependent toxicity of a South American toad, Rhinella arenarum / C.M. Aronzon [et al.] // Environm. Toxicol. - 2011. - Vol. 26, N4. - P. 373-381.
14. Temporal changes in the prevalence of childhood asthma and allergies in urban and rural areas of Cyprus: results from two cross sectional studies / O. Kolokotroni[et al.] // BMC Public Health. - 2011. - Vol.11, N11. - P. 858.