

MAIA MATOSHVILI¹, NINO ADAMIA¹, IA PANTSULAIA², DIMITRI ABELASHVILI¹,
DAVID TOPURIA¹, DAREDJAN KHACHAPURIDZE³

**EPIDEMIOLOGIC PECULIARITIES OF ALLERGIC DERMATITIS IN CHILDREN AND
ADOLESCENTS IN THE POPULATION OF GEORGIA**

¹ Tbilisi State Medical University; ² TSMU VI. Bakhtashvili Institute of Medical Biotechnology,

³ Kutaisi Akaki Tsereteli State University

Doi: <https://doi.org/10.52340/jecm.2022.06.011>

მაია მათოშვილი¹, ნინო ადამია¹, ია ფანცულაია², დიმიტრი აბელაშვილი¹,
დავით თოფურია¹, დარეჯან ხაჭაპურიძე³

**ბავშვებსა და მოზარდებში ალერგიული დერმატიტების ეპიდემიოლოგიური
თავისებურებები საქართველოს პოპულაციაში**

¹თბილისის სახელმწიფო სამედიცინო უნივერსიტეტი, ²თსსუ ვლ. ბახუტაშვილის სამედიცინო
ბიოტექნოლოგიის ინსტიტუტი, ³ქუთაისის აკაკი წერეთლის სახელობის უნივერსიტეტი

რეზიუმე

ჩვენი კვლევის მიზანს წარმოადგენს ბავშვებსა და მოზარდებში ალერგიული დერმატიტების (ატოპიური დერმატიტის, კონტაქტური დერმატიტის, სეზონური დერმატიტის, ურტიკარია და ანგიოშემუშების, ფსორიაზის გავრცელება) ეპიდემიოლოგიური თავისებურებების შესწავლა საქართველოში.

კვლევის მასალა და მეთოდები: ალერგიული დერმატიტების სიმპტომების აქტიური გამოვლენა, ანუ გავრცელების შესწავლა წარმოებდა 2016-2021 წლებში (კლინიკაში მომართვიანობის და ამბულატორიული პაციენტების შემოღინების კვლევის შედეგები) ერთმომენტიანი ეპიდემიოლოგიური კვლევის საფუძველზე. კვლევის ფარგლებში შემუშავდა ატოპიური დერმატიტის გაფართოებული კვლევის სპეციალიზირებული კითხვარი. შესწავლილი იქნა ქ. ქუთაისში და მის შემოგარენში, ასევე თბილისისა და ბათუმის მცხოვრები 3-თვიდან 15-წლამდე ასაკის 2699 ბავშვი (გოგონა - 1721 და ვაჟი - 978). კვლევის შედეგების სტატისტიკური ანალიზი განხორციელდა SPSS.v12 პროგრამული პაკეტის გამოყენებით. სარწმუნოების კრიტიკულ მნიშვნელობად მიჩნეულ იქნა $P < 0.05$.

კვლევის შედეგების მიხედვით გამოკვლეული კონტინგენტიდან ატოპიური დერმატიტი დიაგნოსტირებულ იქნა 24,8% შემთხვევაში, ურტიკარია 5,9%, ანგიონევროტული შემუშება 2,4%, კონტაქტური დერმატიტი 2,9%, სეზონური დერმატიტი 3,2%, ფსორიაზი გამოვლინდა ბავშვთა პოპულაციის მოზარდული ასაკის 1,8% შემთხვევაში, რომელიც იყო პირველად დიაგნოსტირებული ($P < 0,05$).

ალერგიული დერმატიტების დავიანებული და/ან ჰიპოდიაგნოსტიკა სადღეისოდ კვლავ პრობლემად რჩება. ბავშვთა პოპულაციაში ეპიდემიოლოგიური კვლევის შედეგად ალერგიული ატოპიური დერმატიტების დიაგნოზი ემყარებოდა დაავადების კლინიკურ სურათს – კლინიკურ კრიტერიუმებს. პრაქტიკულად არ არსებობს ლაბორატორიული ტესტი, რომელიც დამოუკიდებლად დაადგენს ატოპიური დერმატიტების არსებობას. პაციენტთა დაახლოებით 79%-ს, სისხლის შრატში, აღენიშნება საერთო IgE-ს მაღალი დონე და პერიფერიული სისხლის ეოზინოფილია ($P < 0,05$). თუ მოვახერხებთ სპეციფიკური ალერგენის იდენტიფიკაციას, ვნახავთ, რომ სისხლის შრატში მის მიმართ ყოველთვის არსებობს სპეციფიკური IgE ანტისხეულები, რომელიც გამოვლინდა ჩვენი კვლევის შედეგად.

დასკვნა: ეპიდემიოლოგიური კვლევის საფუძველზე დაფიქსირდა ჰიპოდიაგნოსტიკის მაღალი სიხშირე. ჩვენი კვლევა საჭიროებს შემდგომ გაღრმავებას განსაკუთრებული ჯგუფების ბავშვების პროსპექტულ დაკვირვების და ალერგიული ატოპიური დერმატიტების გამოვლინების თავისებურებების შესწავლის მიმართულებით.

Allergic diseases are considered as a global public health problem. Permanent increase in frequency of allergic diseases among the population of industrialized countries, with the increasing tendency of

growth, has been observed throughout the world. At this stage, according to the data provided by the World Allergy Organization (WAO), the prevalence of allergic diseases worldwide has entered a catastrophic phase not only in developed but developing countries. The rate of prevalence of allergic diseases in the world population is up to 35-40% [1,2,3,4,5]. The increased prevalence of allergy in the child population (15-25%) is an issue of great importance. According to the prognosis of WHO in the coming decades an increase in the incidence of allergic diseases to 1-2% might be expected [5,6,7,8,9,10]. According to the predictive data suggested by WHO and WAO, the main reasons for expansion of allergies on a worldwide scale in the future might be the following: environmental pollution, global warming and growing migratory processes [11,12,13]. The greatest achievements of the last century in the field of molecular and biological immunology contributed to the intensive study of the essence of allergic diseases and pathophysiological mechanisms for their development. One of the allergic diseases ("Bronchial asthma" and "Allergic rhinitis", "Polynosis"), the management of which had been developed more efficiently (GINA, ARIA and ISAAC), proved to be a very important document [14,15,16,17,18]. Some important steps have also been taken in combating atopic dermatitis, seborrheic dermatitis, contact dermatitis, urticaria, angioedema and psoriasis, however, there are many unresolved problems in this regard [18,19,20,21,22,23,24]. The growing tendency of the prevalence of allergic dermatitis, range of its variability in populations, medico-social significance and impact on the quality of life, determine the actuality and relevance of population study in Georgia.

The aim of our study was an investigation of epidemiological peculiarities of allergic dermatitis in children and adolescents (distribution of atopic dermatitis, contact dermatitis, seborrheic dermatitis, urticaria and angioedema, psoriasis) in the population of Georgia.

Materials and methods of the study: active detection of the symptoms of allergic dermatitis or the rate of incidence (data obtained in 2016-2021; results of the study on applying (inflow) ambulatory patients to the clinic) have been conducted on the basis of one-moment epidemiological study. Have been developed: a questionnaire-survey; a specialized questionnaire for advanced study and detection of atopic dermatitis; the diagnostic criteria of atopic dermatitis were approved according to international questionnaire ISAAC (International Study of Asthma and Allergies in Childhood) and taking into account the classification, suggested by LORIA. The representative target group was selected.

The study group included 2699 children, 3 months to 15 years of age (girls - 1721 and boys - 978) living in Kutaisi and its suburban areas, in Tbilisi and Batumi. On the first stage of epidemiological study, the questionnaire-survey was completed by direct conversation with the parents. This survey questionnaire was focused on identifying the symptoms of allergic dermatitis (atopic dermatitis, contact dermatitis, seborrheic dermatitis, urticaria, psoriasis and angioedema) – the primary diagnosis. The clinical verification of diagnosis was carried out according to ISAAC and diagnostic criteria provided by LORIA. At the second stage, the survey was conducted with all the respondents who positively answered the questions related to the "ever" signs of allergic dermatitis by using the extended specialized map for allergic dermatitis.

The clinico-allergological study was conducted in the group (1298 patients) of patients who had the symptoms of allergic dermatitis during the last 24 months. For providing specific diagnosis skin allergic tests have been performed in some patients by using the standard kit of ALK scherax. The standard kit of allergens was represented by food, herbal (drug allergies) epidermal and everyday life allergens. In some patients IgE level was detected by immunofluorescent test.

Consequently, epidemiological study of allergic dermatitis in the child population of Kutaisi, Tbilisi and Batumi was carried out in compliance with the principles of clinical epidemiology and was based on the following material: scanning results (408) of representative/target group of children population (2699 children); results of clinico-allergological study; mathematical analysis of the study results was conducted by Microsoft Excel 2010 and SPSS/v12 software packages. The index $p < 0.05$ was considered as a critical value of reliability.

Results of the study and analysis: The studied contingent was divided into three groups according to the age: I - children from 3 months - 3 years; II – 3 - 9 years and III - 9 - 15 years old respectively.

Table #1. Symptoms/signs of allergic dermatitis

#	Description of symptoms	%
1	Itching	12.9%
2	Rashes (papular or maculopapular)	23.6%, (15.7%- II-gr)
3	Redness	12.8%
4	Vascular edema/swelling	5.7%
5	Purulent rash	3.9%
6	Insomnia, sleeplessness	5.8%
7	Excitability, sensitiveness	2.5%
8	And other types of skin rushes	5.8%

Study results shown, that during 24 months the episodes of recurrent itching was revealed in 12.9% of total group, 39.7% of which consisted of the children of the second age-group, 11.6% - belonged to the first age-group and 48.7% - to the third age-group, respectively.

Insomnia was observed in 5.8% of surveyed population, excitability - in 2.5% of children of the first age-group, and purulent rash of popular vesicular type in 23.6% of the surveyed population, respectively, mainly in 15.7% of the population who belonged to the second age-group. Vascular edema was observed in 5.7% of cases in all I-II-III age-groups. The redness was fixed in 12.8% of cases, mainly in children of the first age-group (56.7%). The infectious purulent rash was revealed in 3.9% of the studied population. In 5.8% of cases, these symptoms were accompanied with various skin inflammatory diseases which were identified in 9.8% of the children population. The rate of distribution of the symptoms of allergic dermatitis was relatively higher among the boys in comparison with the girls ($p < 0.05$) Table 1. The respondents with allergic dermatitis (341 children) were indicating to the exacerbation of atopic dermatitis in 7.9% of children population from 3 months to 1 year of age-group. 35.7% of surveyed children population indicated that the symptoms have a negative impact on their everyday life and activities. Less intense discomfort was recorded by 48.3% of respondents.

Atopic dermatitis was diagnosed in 24.8% of cases; urticaria in 5.9%; angioedema was revealed in 2.4%; contact dermatitis in 2.9%; seborrheic dermatitis – 3.2%; psoriasis - in 1.8% of primarily diagnosed children population ($p < 0.05$), respectively. Nowadays, late diagnosis and hypo-diagnosis of allergic dermatitis still remains a problem.

At the next stage of the epidemiological study, the etiological structure of allergic dermatitis has been investigated. Among the identified patients (341 children), the study was conducted in 168 randomly selected patients. (341 children) the study was carried out in 168 randomly-selected patients. According to the anamnesis, the episodes of itching, edema and other related symptoms were predominately revealed in 73% of children population ($p < 0.05$).

On the basis of skin prick-tests, the prevalence (61.2% $P < 0,05$) of food allergy and sensitization (21.0% in $P < 0.05$) of allergic eosinophilic esophagitis in adult population have been confirmed.

Table # 2. The Spectrum /range and number of conducted studies

Study parameters	Number of studied children
Total IgE	84
Skin test	84

The pathogenesis of the disease was rather difficult, and a significant role was attributed to blood serum IgE, which proved to be high in 79% of patients with this pathology. When detecting a specific allergen, the allergen-specific IgE antibodies should be always found in blood serum.

Conclusion: According to the epidemiological study, the diagnosis of allergic atopic dermatitis in children population was based on the clinical picture of the disease - clinical criteria. Actually, there is no laboratory test that will independently determine the presence of atopic dermatitis. Approximately 79% of patients have high blood serum IgE levels and peripheral blood eosinophilia ($P < 0.05$). If we manage to identify specific allergen, the allergen-specific bloodserum IgE-antibodies will be always detected, as it

was proved by our study. According to the epidemiological study the high frequency of hypo diagnosis has been observed. The current study requires paying more attention to the prospective monitoring of the mentioned specific groups of the child population and studying the peculiarities of the further manifestations of allergic atopic dermatitis.

References:

1. Pelucchi, C; Galeone, C; Bach, JF; La Vecchia, C; Chatenoud, L (September 2013). "Pet exposure and risk of atopic dermatitis at the pediatric age: a meta-analysis of birth cohort studies.". *The Journal of Allergy and Clinical Immunology*. 132 (3): 616–622.e7. doi:10.1016/j.jaci.2013.04.009. PMID 23711545.
2. Flohr, C; Mann, J (January 2014). "New insights into the epidemiology of childhood atopic dermatitis" (PDF). *Allergy*. 69 (1): 3–16. doi:10.1111/all.12270. PMID 24417229.
3. Mauro G, Bernardini R, Barberi S, Capuano A, Correr A, De' Angelis GL; et al. (2016). "Prevention of food and airway allergy: consensus of the Italian Society of Preventive and Social Paediatrics, the Italian Society of Paediatric Allergy and Immunology, and Italian Society of Pediatrics.". *World Allergy Organ J (Review)*. 9: 28.
4. Sergio Moreno-LópezLucía C. Pérez-HerreraDaniel PeñarandaDiana C. HernándezElizabeth GarcíaAugusto Peñaranda Prevalence and associated factors of allergic diseases in school children and adolescents aged 6–7 and 13–14 years from two rural areas in Colombia Apr 2021 in *Allergologia et immunopathologia* DOI: 10.15586/aei.v49i3.183
5. Luis Caraballo1*, Josefina Zakzuk1, Bee Wah Lee2,3, Nathalie Acevedo4, Jian Yi Soh2,3, Mario Sánchez-Borges5 , Elham Hossny6 , Elizabeth García7 , Nelson Rosario8 , Ignacio Ansotegui9 , Leonardo Puerta1 , Jorge Sánchez10 and Victoria Cardona11 Particularities of allergy in the Tropics . *World Allergy Organization Journal* (2016) 9:20 DOI 10.1186/s40413-016-0110-7
6. DeckersIA, Mclean S, et al, Investigating international time trends in the incidence of atopic eczema 1990-2010: a systematic review of epidemiological studies. *Plos one* 2012; 7:e39803
7. WHO-Press, 2012
8. Totté, JE; van der Feltz, WT; Hennekam, M; van Belkum, A; van Zuuren, EJ; Pasmans, SG (19 March 2016). "Prevalence and odds of Staphylococcus aureus carriage in atopic dermatitis: a systematic review and meta-analysis". *The British journal of dermatology*. 175: 687–695. doi:10.1111/bjd.14566. PMID 26994362.
9. Ruby Pawankar; Stephen T. Holgate; G. Walter Canonica; Richard F. Lockey; Michael S. Blaiss; WAO White Book on Allergy 2013 Update
10. Pawankar R, Wang JY, Wang IJ, Thien F, Chang YS, Latiff AHA, Fujisawa T, Zhang L, Thong BY, Chatchatee P, Leung TF, Kamchaisatian W, Rengganis I, Yoon HJ, Munkhbayarlakh S, Recto MT, Neo AGE, Le Pham D, Lan LTT, Davies JM, Oh JW. Asia Pacific Association of Allergy Asthma and Clinical Immunology White Paper 2020 on climate change, air pollution, and biodiversity in Asia-Pacific and impact on allergic diseases. *Asia Pac Allergy*. 2020 Feb 7;10(1): e11. doi: 10.5415/apallergy.2020.10.e11. eCollection 2020 Jan. PMID: 32099833
11. Oliver CH Herbert, Ross STC Barnetson, Wolfgang Weninger, Ursula Krämer, HeidrunBehrendt and Johannes RinWestern Lifestyle and Increased Prevalence of Atopic Diseases, *World Allergy Organization Journal* 2009, 2:130-137
12. Mario Sánchez-Borges, Riccardo Asero, Ignacio J Ansotegui, Ilaria Baiardini, Jonathan A Bernstein, G Walter Canonica, Richard Gower, David A Kahn, Allen P Kaplan, Connie Katelaris, Marcus Maurer, Hae Sim Park, Paul Potter, Sarbjit Saini, Paolo Tassinari, Alberto Tedesch, Young Min Ye, Torsten Zuberbier ; the WAO Scientific and Clinical Issues Council Diagnosis and Treatment of Urticaria and Angioedema: A Worldwide Perspective, *World Allergy Organization Journal*, 2012 (5):125-147.
13. D'Amato G, Vitale C, Rosario N, Neto HJC, Chong-Silva DC, Mendonça F, et al. Climate change, allergy and asthma, and the role of tropical forests. *World Allergy Organ J* 2017;10:11

14. Bieber T, Cork M, Reitamo S, Atopic dermatitis: a candidate for disease-modifying strategy, *Allergy* 2012, 67, 969-975
15. Antonella Muraro, Graham Roberts et al, *Food Allergy and Anaphylaxis*, Published by the EAACI, 2014;
16. Gary W. Cole, MD, FAAD, Atopic Dermatitis, Medically Reviewed by a Doctor on 12/21/20
17. Kligman: *Nelsons Textbook of pediatrics*. 20th.ed. 2015
18. Thomsen, SF (2014). "Atopic dermatitis: natural history, diagnosis, and treatment.". *ISRN allergy*. 2014: 354250. doi:10.1155/2014/354250. PMC 4004110. PMID 25006501.
19. "Handout on Health: Atopic Dermatitis (A type of eczema)". National Institute of Arthritis and Musculoskeletal and Skin Diseases. May 2013. Retrieved 19 June 2015.
20. Tollefson, MM; Bruckner, AL; SECTION ON, DERMATOLOGY; SECTION ON, DERMATOLOGY (December 2014). "Atopic dermatitis: skin-directed management.". *Pediatrics*. 134 (6): e1735–44. doi:10.1542/peds.2014-2812. PMID 25422009.
21. Berke, R; Singh, A; Guralnick, M (July 2012). "Atopic dermatitis: an overview" (PDF). *American Family Physician*. 86 (1): 35–42. PMID 22962911.
22. Kim, BS (21 January 2014). Fritsch, P; Vinson, RP; Perry, V; Quirk, CM; James, WD, eds. "Atopic Dermatitis". *Medscape Reference*. WebMD. Retrieved 3 March 2014.
23. David Orton Non-atopic dermatitis *Medicine* Volume 49, Issue 6, June 2021, Pages 374-376
24. Jaros Joanna, Hendricks Aleks J., Shi Vivian Y., Lio Peter A. A Practical Approach to Recalcitrant Face and Neck Dermatitis in Atopic Dermatitis, *Dermatitis*: 2020 May-June; 31(3):169-177.

*МАЙЯ МАТОШВИЛИ¹, НИНО АДАМИЯ¹, ИЯ ПАНЦУЛАЯ², ДМИТРИЙ АБЕЛАШВИЛИ¹,
ДАВИД ТОПУРИЯ¹, ДАРЕДЖАН ХАЧАПУРИДЗЕ³*

ЭПИДЕМИОЛОГИЧЕСКИЕ ОСОБЕННОСТИ АЛЛЕРГИЧЕСКОГО ДЕРМАТИТА У ДЕТЕЙ И ПОДРОСТКОВ ГРУЗИИ

¹Тбилисский государственный медицинский университет;

² ТГМУ Институт медицинской биотехнологии имени Вл. Бахуташвили;

³ Кутаисский Государственный Университет им. Акаки Церетели

РЕЗЮМЕ

Целью нашего исследования является изучение эпидемиологических особенностей аллергического дерматита у детей и подростков (распространение атопического дерматита, контактный дерматит, себорейный дерматит, крапивница и ангиодистрофия, псориаз) у населения Грузии.

Материалы и методы исследования: активное выявление симптомов аллергического дерматита (данные, полученные в 2016-2021 гг., результаты обращения амбулаторных пациентов в клинику) на основе одномоментного эпидемиологического исследования. Были разработаны: анкета-вопросник и специализированный вопросник для изучения и выявления атопического дерматита; в группу вошли 2699 детей, от 3 месяцев до 15 лет (девочки - 1721 и мальчики - 978), проживающие в Кутаиси и его пригородных районах, Тбилиси и Батуми. Математический анализ результатов исследования проводился с использованием программных пакетов Microsoft Excel 2010 и SPSS/v12. Показатель $p < 0,05$ рассматривался как критическое значение надежности.

Согласно результатам исследования, атопический дерматит был у 24,8% пациентов; крапивница у 5,9%; ангиодистрофия у 2,4%; контактный дерматит - 2,9%; себорейный дерматит - 3,2%, псориаз выявлен у 1,8% пациентов детского населения ($p < 0,05$). В настоящее время все еще остается проблема поздней диагностики и гиподиагностики аллергического дерматита.

Заключение: согласно эпидемиологическому исследованию, диагноз аллергического атопического дерматита у детей был основан на клинической картине (клинические критерии заболевания). На самом деле, нет лабораторного теста, который бы самостоятельно определял наличие атопического дерматита. Примерно 79% пациентов имеют высокий уровень IgE в

сыворотке крови и эозинофилию в периферической крови ($P < 0,05$). Если нам удастся идентифицировать специфический аллерген, то аллерген-специфические IgE-антитела в сыворотке крови будут всегда выявлены, как это было в нашем исследовании. По данным эпидемиологического исследования наблюдается высокая частота гиподиагностики.

Настоящее исследование требует внимания к проспективному наблюдению за указанными конкретными группами детского населения и изучению особенностей дальнейших проявлений аллергического атопического дерматита.

MAIA MATOSHVILI¹, NINO ADAMIA¹, IA PANTSULAIA², DIMITRI ABELASHVILI¹, DAVID TOPURIA¹, DAREDJAN KHACHAPURIDZE³

EPIDEMIOLOGIC PECULIARITIES OF ALLERGIC DERMATITIS IN CHILDREN AND ADOLESCENTS IN THE POPULATION OF GEORGIA

¹ Tbilisi State Medical University; ² TSMU Vl.Bakhtashvili Institute of Medical Biotechnology, ³ Kutaisi Akaki Tsereteli State University

SUMMARY

The aim of our study was an investigation of epidemiological peculiarities of allergic dermatitis in children and adolescents (distribution of atopic dermatitis, contact dermatitis, seborrheic dermatitis, urticaria and angioedema, psoriasis) in the population of Georgia.

Materials and methods of the study: The study group included 2699 children, 3 months - 15 years of age (girls - 1721 and boys - 978) living in Kutaisi and its suburban areas, in Tbilisi and Batumi (data obtained in 2016-2021; results of the study on applying (inflow) ambulatory patients to the clinic). On the first stage of epidemiological study, the questionnaire-survey was completed by direct conversation with the parents. This survey questionnaire was focused on identifying the symptoms of allergic dermatitis (atopic dermatitis, contact dermatitis, seborrheic dermatitis, urticaria, psoriasis and angioedema) – the primary diagnosis. In some patients IgE level was detected by ELISA. Results of clinico-allergological study; mathematical analysis of the study results were conducted by SPSS 12.0 software packages. The index $p < 0.05$ was considered as a critical value of reliability.

Results of the study and analysis: According to the epidemiological study, the diagnosis of allergic atopic dermatitis in children population was based on the clinical picture of the disease - clinical criteria. In fact, there is no laboratory test that will independently determine the presence of atopic dermatitis. Approximately 79% of patients have high blood serum IgE levels and peripheral blood eosinophilia ($P < 0.05$). According to the study results, atopic dermatitis was diagnosed in 24.8% of cases; urticaria in 5.9%; angioedema was revealed in 2.4%; contact dermatitis in 2.9%; seborrheic dermatitis – 3.2%; psoriasis - in 1.8% of primarily diagnosed children population ($p < 0.05$), respectively. Nowadays, late diagnosis and hypo-diagnosis of allergic dermatitis still remains a problem. If we manage to identify specific allergen, the allergen-specific blood serum IgE-antibodies will be always detected, as it was proved by our study.

Conclusion: According to the epidemiological study the high frequency of hypo diagnosis has been observed. The current study requires paying more attention to the prospective monitoring of the mentioned specific groups of the child population and studying the peculiarities of the further manifestations of allergic atopic dermatitis.

