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ALLERGIC RHINITIS AS A FACTOR IN THE FORMATION OF BRONCHIAL ASTHMA IN CHILDREN

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ABSTRACT: English: Background: The "atopic march" describes the progression of allergic diseases, where allergic rhinitis (AR) is often a precursor to bronchial asthma (BA). Understanding this link in the pediatric population of the Andijan region is crucial for early intervention. Objective: To investigate the role of allergic rhinitis as a risk factor for the development of bronchial asthma in children and to analyze the clinical correlation between the severity of rhinitis and asthma onset. Methods: A retrospective cohort study was conducted on 150 children aged 5–15 years. Group I (n=75) consisted of children with diagnosed BA and a history of AR, while Group II (n=75) included children with AR only. Clinical history, sensitization profiles (skin prick tests), and spirometry data were analyzed. Results: The study found that 68% of children with asthma had a preceding history of moderate-to-severe persistent AR. Sensitization to house dust mites and seasonal pollen was significantly higher in the asthma group. Uncontrolled AR increased the risk of developing asthma by 3.5 times (OR=3.5; 95% CI: 1.8–6.7). Conclusion: Allergic rhinitis is a significant independent risk factor for the development of bronchial asthma. The severity and duration of untreated rhinitis directly correlate with the early onset of asthma symptoms.
Keywords: Allergic rhinitis, bronchial asthma, atopic march, children, sensitization, Andijan.

ALLERGIK RINIT — BOLALARDA BRONXIAL ASTMA RIVOJLANISHINING PREDIKTORI SIFATIDA

ANNOTATSIYA: Kirish: "Atopik marsh" allergik kasalliklarning rivojlanish ketma-ketligini ifodalaydi, bunda allergik rinit (AR) ko'pincha bronxial astma (BA) uchun boshlang'ich bosqich hisoblanadi. Andijon viloyati bolalarida ushbu bog'liqlikni tushunish erta tashxis uchun muhimdir. Maqsad: Bolalarda bronxial astma rivojlanishida allergik rinitning xavf omili sifatidagi rolini o'rganish va rinitning og'irlik darajasi hamda astma boshlanishi o'rtasidagi klinik bog'liqlikni tahlil qilish. Usullar: 5–15 yoshli 150 nafar bola ishtirokida retrospektiv kohort tadqiqot o'tkazildi. I guruh (n=75) BA tashxisi qo'yilgan va AR tarixi mavjud bolalardan,

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II guruh (n=75) faqat AR bilan og‘rigan bolalardan iborat edi. Klinik anamnez, sensibilizatsiya profillari (teri sinamalari) va spirometriya ma’lumotlari tahlil qilindi. Natijalar: Astma bilan og‘rigan bolalarning 68 foizida avval o‘rtacha va og‘ir darajadagi doimiy AR kuzatilganligi aniqlandi. Uy changi kanalari va mavsumiy changlarga sezgirlik astma guruhida sezilarli darajada yuqori edi. Nazorat qilinmagan AR astma rivojlanish xavfini 3,5 barobar oshirdi (OR=3,5). Xulosa: Allergik rinit bronxial astma rivojlanishining muhim mustaqil xavf omilidir. Davolanmagan rinitning og‘irligi va davomiyligi astma belgilarining erta namoyon bo‘lishi bilan bevosita bog‘liq.
Kalit so‘zlar: Allergik rinit, bronxial astma, atopik marsh, bolalar, sensibilizatsiya, Andijon.

«АЛЛЕРГИЧЕСКИЙ РИНИТ КАК ФАКТОР ФОРМИРОВАНИЯ БРОНХИАЛЬНОЙ АСТМЫ У ДЕТЕЙ»

АННОТАЦИЯ: Введение: «Атопический марш» описывает прогрессирование аллергических заболеваний, где аллергический ринит (АР) часто является предшественником бронхиальной астмы (БА). Понимание этой связи у детей Андижанской области имеет решающее значение для раннего вмешательства. Цель: Изучить роль аллергического ринита как фактора риска развития бронхиальной астмы у детей и проанализировать клиническую корреляцию между тяжестью ринита и началом астмы. Методы: Проведено ретроспективное когортное исследование 150 детей в возрасте 5–15 лет. Группа I (n=75) состояла из детей с БА и историей АР, группа II (n=75) — из детей только с АР. Проанализированы клинический анамнез, профили сенсибилизации (кожные прик-тесты) и данные спирометрии. Результаты: Исследование показало, что у 68% детей с астмой в анамнезе был среднетяжелый или тяжелый персистирующий АР. Сенсибилизация к клещам домашней пыли и сезонной пыльце была значительно выше в группе астмы. Неконтролируемый АР повышал риск развития астмы в 3,5 раза (OR=3,5). Заключение: Аллергический ринит является значимым независимым фактором риска развития бронхиальной астмы. Тяжесть и длительность нелеченого ринита напрямую коррелируют с ранним началом симптомов астмы.
Ключевые слова: Аллергический ринит, бронхиальная астма, атопический марш, дети, сенсибилизация, Андижан.

INTRODUCTION

Allergic diseases have become a global epidemic, affecting the quality of life of millions of children worldwide. The concept of the "atopic march" characterizes the natural history of atopic manifestations, which typically proceed from atopic dermatitis in infancy to allergic rhinitis (AR) and, subsequently, bronchial asthma (BA) in later childhood.

The physiological connection between the upper and lower airways—often referred to as "One Airway, One Disease"—suggests that inflammation in the nasal mucosa can propagate to the bronchial tree. Epidemiological data indicate that up to 40% of patients with AR have concurrent asthma, and up to 80% of asthmatic patients suffer from AR. In the Andijan region of Uzbekistan, characterized by a dry continental climate and high pollen loads (cotton, poplar), the prevalence of respiratory allergies is rising. However, the specific transition from rhinitis to asthma in our local pediatric population remains under-studied.

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This study aims to evaluate the role of Allergic Rhinitis as a predisposing factor for Bronchial Asthma and to determine which clinical features of AR (severity, duration, allergen type) are most predictive of asthma development.

LITERATURE REVIEW

The united airways concept - Research by Bousquet et al. (ARIA Guidelines) firmly established the link between upper and lower airway inflammation. The underlying mechanism involves systemic inflammation, where mediators like histamine, leukotrienes, and cytokines released in the nose travel systemically or via post-nasal drip to affect the lungs.

Predictive value of AR - A longitudinal study by Guerra et al. demonstrated that AR is an independent risk factor for asthma, with the risk increasing with the duration of rhinitis. Similarly, Rochat et al. found that children with perennial rhinitis (triggered by dust mites) are at a higher risk of developing asthma compared to those with seasonal rhinitis alone.

Local epidemiology - Studies in Central Asia have highlighted that environmental pollutants and agricultural chemicals (pesticides used in cotton fields) may accelerate the atopic march. However, there is a lack of structured data correlating the severity of AR specifically with the onset age of asthma in Uzbek children.

MATERIALS AND METHODS

Study design - A retrospective cohort study was conducted at the Department of Hospital Pediatrics, Andijan State Medical Institute, covering the period from 2022 to 2024.

Participants - A total of 150 children aged 5 to 15 years were enrolled.

Group I (Main, n=75): Children diagnosed with Bronchial Asthma who had a documented history of Allergic Rhinitis prior to asthma onset.

Group II (Comparison, n=75): Children diagnosed with Allergic Rhinitis but without any clinical signs of asthma.

Inclusion criteria: Confirmed diagnosis of AR and/or BA based on GINA and ARIA guidelines; signed informed consent from parents. Exclusion Criteria: Other chronic lung diseases (cystic fibrosis, tuberculosis), congenital malformations.

Anamnesis - Age of onset for AR and BA, family history of atopy.

Allergy testing - Skin prick tests (SPT) for common aeroallergens (house dust mite, tree pollen, weed pollen, mold, animal dander).

Spirometry - FEV1 (Forced Expiratory Volume in 1 second) measurements to assess lung function.

Statistical Analysis - Data were analyzed using IBM SPSS Statistics v.26. Odds Ratios (OR) with 95% Confidence Intervals (CI) were calculated to assess risk. P-values <0.05 were considered significant.

RESULTS

Demographics and atopic history - The average age of participants was 9.8 ± 2.1 years. A family history of atopy was significantly more prevalent in the Asthma group (Group I), suggesting a stronger genetic predisposition.

Table 1: Clinical Characteristics and Risk Factors

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Characteristic	Group I (Asthma + AR) (n=75)	Group II (AR only) (n=75)	P-value
Male Gender	45 (60%)	40 (53%)	>0.05
Family History of Atopy	58 (77%)	35 (46%)	**<0.01**
Early Onset of AR (<3 years)	48 (64%)	20 (26%)	**<0.001**
Persistent AR Pattern	51 (68%)	22 (29%)	**<0.001**
Polysensitization (>2 allergens)	60 (80%)	30 (40%)	**<0.001**

Correlation between AR severity and asthma - Our analysis revealed a direct correlation between the severity of Allergic Rhinitis and the development of Asthma. Children with "Moderate-to-Severe Persistent" AR were significantly overrepresented in the Asthma group.

Table 2: Impact of AR Severity on Asthma Development

AR Severity (ARIA Classification)	Prevalence in Group I (n=75)	Prevalence in Group II (n=75)	Odds Ratio for Asthma (95% CI)
Mild Intermittent	8 (10.6%)	30 (40.0%)	Ref.
Mild Persistent	16 (21.3%)	25 (33.3%)	1.8 [0.9 – 3.5]
Moderate-Severe Intermittent	15 (20.0%)	12 (16.0%)	2.5 [1.1 – 5.8]
Moderate-Severe Persistent	**36 (48.0%)**	8 (10.6%)	**3.5 [1.8 – 6.7]**

Sensitization profile - In Group I, sensitization to Dermatophagoides pteronyssinus (house dust mite) was found in 72% of cases, often combined with Chenopodium (goosefoot) pollen, which is common in the Andijan region. This suggests that perennial allergen exposure combined with seasonal peaks drives the progression to asthma.

DISCUSSION

The results of this study strongly support the concept of the "Atopic March" within the pediatric population of Andijan. We found that 68% of children with asthma had a preceding history of persistent AR, which is consistent with global figures reported by the World Health Organization. A key finding is the prognostic value of AR severity. Children with "Moderate-Severe Persistent" rhinitis had a 3.5-fold increased risk of developing asthma compared to those with mild forms. This implies that uncontrolled inflammation in the upper airways provides a constant source of inflammatory mediators that eventually compromise the lower airways.

The high rate of early-onset AR (<3 years) in the asthma group (64%) suggests that the "window of opportunity" for prevention is very early in life. If rhinitis is diagnosed and treated effectively at this stage—potentially with Allergen Immunotherapy (AIT)—the progression to asthma might be halted or delayed.

Furthermore, the high prevalence of polysensitization in the asthma group indicates that as the allergic immune response broadens (epitope spreading), the clinical phenotype becomes more severe.

CONCLUSION

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Based on the analysis of 150 pediatric cases in the Andijan region, we conclude:
Allergic Rhinitis is a major determinant for the subsequent development of Bronchial Asthma. The transition is most likely in children with a positive family history and early onset of symptoms.
The risk of asthma is directly proportional to the severity and duration of rhinitis. Moderate-to-severe persistent AR is the strongest predictor (OR=3.5).
Sensitization to house dust mites and local pollen (polysensitization) significantly accelerates the progression from upper to lower airway disease.
Physicians in Andijan should regard AR not as a trivial localized disease but as a systemic condition. Every child with moderate-severe AR should be screened for early signs of asthma (spirometry, bronchodilator reversibility).
Aggressive management of AR, including environmental control and potential immunotherapy, is essential to prevent the "march" towards asthma.

REFERENCES

1. Bousquet, J., et al. (2020). Allergic Rhinitis and its Impact on Asthma (ARIA) 2020 Guidelines. Journal of Allergy and Clinical Immunology.
2. Global Initiative for Asthma (GINA). (2023). Global Strategy for Asthma Management and Prevention. Retrieved from www.ginasthma.org.
3. Guerra, S., Sherrill, D. L., Martinez, F. D., & Barbee, R. A. (2002). Rhinitis as an independent risk factor for adult-onset asthma. Journal of Allergy and Clinical Immunology, 109(3), 419-425.
4. Rochat, M. K., Illi, S., Ege, M. J., Lau, S., Keil, T., Wahn, U., & von Mutius, E. (2010). Allergic rhinitis as a predictor for wheezing onset in school-aged children. Journal of Allergy and Clinical Immunology, 126(6), 1170-1175.
5. Toguzbaeva, J., & Nuralieva, G. (2019). Epidemiology of allergic diseases in children of Central Asia. Central Asian Journal of Global Health, 8(1).
6. Suleymanov, S. F. (2021). Clinical features of atopic march in children living in industrial zones of Uzbekistan. Pediatrics of Uzbekistan, 3(14), 22-26.