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ORIGINAL ARTICLE

Trends in prevalence and risk factors of allergic rhinitis symptoms in primary schoolchildren six years apart in Budapest

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KEYWORDS

Allergic rhinitis;
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Abstract

Background: Few data are available concerning the time trends and risk factors associated with allergic rhinitis (AR) in schoolchildren in Hungary.

Methods: At an interval of six years, parents of 6–12-year-old children completed identical ISAAC-based and additional questionnaires related to possible risk factors.

Results: Response rate was 62.8% with 6335 questionnaires distributed in 2007, and 52.9% with 6441 questionnaires in 2013. The prevalence of current AR symptoms (subjects presenting clinical symptoms of AR in the past 12 months, but had yet to be diagnosed by physician) increased significantly from 14.9% to 23.5% ($p < 0.001$). There was no significant change in the prevalence of physician-diagnosed AR (11.6–11.2%). In multivariate analysis, gender (OR 0.733; CI 0.642–0.931), a family history of atopy (OR 2.017; CI 1.669–2.436), frequent upper respiratory tract infections (OR 2.033; CI 1.659–2.492), long-lasting disease before the appearance of the allergy (OR 2.119; CI 1.311–3.428), feather bedding (OR 0.773; CI 0.599–0.996) and living in a green area (OR 1.367; CI 1.133–1.650) were found to be significant risk factors of cumulative AR in 2013. In both of the groups with ($p < 0.000$) or without ($p < 0.003$) AR the families with a history of atopy used feather bedding less frequently than families without atopy.

Conclusion: Although the prevalence of physician-diagnosed AR has not shown significant changes during the studied interval, the significant increase of the current AR symptoms suggests growing prevalence of AR among children in Budapest. Our results revealed new aspects of bedding customs in atopic families.

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Introduction

The ARIA document defines allergic rhinitis (AR) as a symptomatic disorder of the nose, induced after allergen exposure, due to immunoglobulin E-mediated inflammation of the membranes lining the nose.¹

AR affects the quality of life of children and incurs medical costs for both the families and the public healthcare system. Comparative time-trend analyses are of paramount importance so that the rapidly changing prevalence of these diseases may be monitored. The International Study of Asthma and Allergies in Childhood (ISAAC), designed as a multicentre-study of the epidemiology of asthma, rhinitis and atopic dermatitis among children, uses standardised questionnaires, which allows doctors to make a possible diagnosis of AR on the basis of patients' symptoms and allows comparisons worldwide.^{2,3}

Phase I documented over 20-fold variations in the prevalence of self-reported rhinitis symptoms between centres throughout the world for the 13- to 14-years age group. Centres in Argentina (60%, 65%), Paraguay (67%), France (58%) and Brazil (55%) reported the highest 12-month period symptom prevalence of rhinitis in this age group, whereas centres in Ethiopia (3%), India (3–9%) and countries in the former Soviet Union (9%, 10%) recorded the lowest symptom prevalence of AR.⁴

Phase III found that there was a minimal global increase in the 12-month prevalence of AR symptoms. Prevalence increases in the older children exceeding 1% per year were recorded in 13 centres (3 of 9 centres in Africa, 2 of 15 in Asia-Pacific, 1 of 8 in India, 3 of 15 in Latin America, 3 of 9 in Eastern Europe and 1 of 34 in Western and Northern Europe). Only four centres registered a decrease of a similar scale in rhinoconjunctivitis prevalence.⁴

The data shows that the prevalence has reached a peak in low and mid-income countries.⁴ However, few studies in Hungary have addressed this topic. ISAAC Phase III in 2003 registered prevalence of current rhinitis symptoms of 17.8% and 12.9%, respectively, among 13- to 14-year-old and 6- to 7-year-old children in Hungary.⁵

In 2007, we assessed the prevalence and the risk factors associated with AR symptoms among schoolchildren aged 6–12 years in Budapest.⁶ The aim of the present study was to re-examine an equivalent age group, with the same questionnaire by the same research team, and to compare the results with those collected six years previously. Prior to our examination only point prevalence studies had been carried out in Hungary. As far as we are aware, this is the first Hungarian study of the time trends in the prevalence of AR among primary schoolchildren. Apart from AR we examined the trends in the prevalence of other allergic diseases such as asthma, eczema and food allergy. By analysing trends, we established whether certain atopic diseases had reached a peak in Hungary. Among other risk factors we analysed the association of feather bedding and atopic family history as this is not considered congruently in the literature.^{6–10}

Material and methods

Study design

Two cross-sectional studies were performed six years apart (2007 and 2013), in the same 21 randomly selected primary schools in eight districts of Budapest located either in the densely built-up city centre or a leafy suburb. The districts were chosen by simple random sampling by the Central Data Processing and Registration Office of the Hungarian Ministry of Home Affairs. At the initial teacher-parent meetings in September the parents of pupils aged 6–12 years were asked to complete identical ISAAC-based questionnaires, although the studies did not form part of ISAAC.

The numbers of distributed questionnaires in the two years were 6335 and 6441, respectively. Detailed instructions were given by the teachers before completion. The questionnaires were collected immediately after the teacher-parent meetings, or at most a week later. They were completed by the parents of 3933 children in 2007 (response rate: 62.8%); (boys: $n=1976$; 50.2% and girls: $n=1957$; 49.8%), and by the parents of 3412 pupils in 2013 (response rate: 52.9%); (boys: $n=1637$; 48.8% and girls: $n=1720$; 51.2%).

The study protocol was approved by the Ethics Committee at Heim Pál Children's Hospital Budapest. Informed consent was obtained from all parents. All parents of the patients included in the study received sufficient information.

The questionnaire

Details of the questionnaire, including the definitions, have been published previously.⁶

The core questions from ISAAC Phase I and its methodology were used.² The questionnaire was translated into Hungarian. It consisted of two main components: a core questionnaire, which included questions about the symptoms of rhinoconjunctivitis, and an environmental one,¹¹ with questions concerning a variety of potential risk factors. Both cross-sectional studies were carried out in the corresponding season, with identical methodologies, thereby allowing a direct comparison.

The prevalence of "diagnosed AR" was determined on the basis of the answers to the question "Has your child had allergic rhinitis diagnosed by a physician?" The parents of those pupils, who answered yes to this (mentioned) question, did not get questions about current AR symptoms. "Current AR" group consists of pupils who had not been diagnosed with AR by physician, but whose parents gave a positive response to the following question: "In the past 12 months, has your child had a problem with sneezing, or a runny, or a blocked nose when he/she did not have a cold or the flu?" In this way there was no overlap between the two groups. The third question related to allergic rhinoconjunctivitis "In the past 12 months, has this nose problem been accompanied by itchy-watery eyes?" A positive response

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