REVIEW ARTICLE

Prevalence and associated factors of allergic rhinitis and atopic dermatitis in children

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ABSTRACT

Allergic disorders are the chronic diseases of greatest pediatric morbidity, affecting over 25 % of the pediatric population. Indeed, this situation has been referred to as an "allergic epidemic". In comparison with asthma, atopic dermatitis and allergic rhinitis have been less extensively investigated, although this does not mean that they should be regarded as minor disorders but rather as alterations that affect the quality of life of the patients and their families, which generate considerable direct and indirect costs.

Despite an important research effort, the reason for this allergic epidemic is not well known. These are multifactor disorders without a single causal agent, in which the most important component is the genetic predisposition of the patient (atopy), modulated by environmental factors, exposure to allergens, infections and irritants, among others. A confounding element is the fact that the concept of allergic diseases encompasses phenotypes of rhinitis, atopic dermatitis or asthma in which no IgE-mediated atopic mechanism is demonstrated, and which can manifest in a way similar to true allergic phenotypes. Differentiation between the two is difficult to establish on the basis of self-administered questionnaires alone, in the absence of a precise etiological diagnosis.

The present article reviews the numerous factors suggested to be responsible for the increase in allergic diseases recorded in the last few decades, and for the differences in prevalence observed among centres. For most of these factors the results published in the literature are contradictory, in some cases due to a lack of control of the associated interacting or confounding factors. Consensus exists for only some of these causal factors, such as the established parallelism between the increase in allergic diseases and the reduction in infectious processes on one hand, and the increase in particles generated by diesel fuel combustion on the other.

In addition, the implicated factors could act differently (and in some cases even antagonically) upon atopy and on the different disease phenotypes, thereby complicating the study of these interactions even further.

Key words: Rhinitis. Rhinoconjunctivitis. Atopic eczema. Atopy. Allergic diseases. Prevalence. Children. ISAAC.

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INTRODUCTION

The prevalence of allergic diseases has increased considerably in the last 30-40 years, and in the industrialized world it is estimated that over 25 % of all children have some form of allergic problem.

Specifically, atopic dermatitis and allergic rhinitis are diseases that typically develop in childhood and should not be regarded as minor disorders but rather as chronic diseases that cause very unpleasant symptoms and affect the quality of life of the patients and their families. In addition, these illnesses generate important costs both directly (consumption of health care resources and drugs) and indirectly (reduction in parent work yield).

Epidemiological studies have revealed important differences in the prevalence of allergic disorders among different countries, and even within single countries, as well as contradictory results in relation to the possible associated risk or protective factors. However, variability in the methodology used may influence the observed differences, thereby complicating comparisons among studies and the drawing of conclusions.

The ISAAC (*International Study of Asthma and Allergies in Childhood*) was created in 1991 with the aim of establishing and comparing the prevalence of allergic disorders in childhood and adolescence in different countries, and to explore their trend over time, thanks to the adoption of standardized methodology. For this purpose, the study used a questionnaire comprising simple questions in an attempt to homogenize the diagnostic criteria in the different parts of the world, thereby preventing the reported differences in prevalence from being attributable to methodological differences. Up until that time there were few multinational epidemiological studies on pediatric allergic diseases, and most were referred to asthma. The studies focusing on atopic dermatitis and rhinitis were practically anecdotal, though the idea that asthma and rhinitis are closely related is now gaining strength.

PREVALENCE OF ALLERGIC DISEASES

Although the prevalence of allergic diseases is growing throughout the world, there are marked inter-regional differences, thus pointing to the influence of environmental factors upon the development of allergic disease. Phase 1 of the ISAAC study[1] reported worldwide rates of rhinoconjunctivitis in the range of 1.4-39.7 % in adolescents of 13-14 years or age, and between 0.8-14.9 % in children aged 6-7 years. With regard to atopic dermatitis, these figures range from 2-16 % in children between 6-7 years of age, and from 1-17 % in those between 13-14 years of age. In Spain, the prevalence of allergic rhinitis and atopic dermatitis in schoolchildren aged 13-14 years in Cartagena was found to be 17.5 % and 6.3 %, respectively.[2]

INCREASE IN PREVALENCE OF ALLERGIC DISEASES

In the last few decades the increase in such diseases, particularly in the developed parts of the world, has been so notorious that the phenomenon has been referred to as an "allergic epidemic". Studies have shown this increase to be genuine, and not attributable to the fact of diagnosing a larger number of cases as a result of improved knowledge of allergic disorders among both physicians and the general population.[3,4] The high prevalence of reported allergic diseases in children of parents without a family history of atopy suggests that much of the prevalence increase in allergic disorders is occurring in children without a significant genetic predisposition.

The starting point and causes of this increase are not fully clear, and different hypotheses have been proposed to explain the situation. Most of these hypotheses are related to changes in lifestyle and to environmental and domestic factors that interact with the immune system in the early stages of life. The increase in the cases diagnosed in industrialized countries appears to occur at the expense of allergic phenotypes, since a parallel increase has been recorded in positive skin tests.[5] This is not extrapolatable to the developing world, where a high prevalence of respiratory symptoms is observed, although these situations correspond to non-allergic phenotypes characterized by earlier and more severe alterations, associated with crowded living conditions and early exposure to environmental pollutants.[6]

In the last few years a number of studies have reported a certain slowing in the increase in prevalence of allergic diseases.[7,8] However, rather than a case of true deceleration, this situation may reflect a lesser reporting of symptoms due to the availability of more effective treatments.[9]

THE HYGIENE THEORY

In 1989, Strachan[10] observed that atopy predominates among first offspring and single children, and for the first time suggested that this may be due to a lack of immune system maturation stimulus on the part of certain infections.

Physiologically, intrauterine life is characterized by important Th2 cell polarization, with intense expression of cytokines (IL-4, IL-10, leukaemia inhibiting factor), the function of which is to counter Th1 responses that are toxic for the placenta.[11] It has been seen that atopic mothers suffer fewer miscarriages and have a larger number of pregnancies,[12] with a greater frequency of deliveries to term, and without compli-