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PREVALENCE AND RISK FACTORS OF ALLERGIC DISEASES IN CHILDREN

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Abstract. Allergic diseases are among the most common chronic health problems of childhood and include asthma, allergic rhinitis, atopic dermatitis and food allergy. Their prevalence varies considerably among countries and age groups, reflecting interactions between genetic susceptibility, environmental exposure, lifestyle and health-system factors. This thesis reviews contemporary evidence on the prevalence of major pediatric allergic diseases and summarizes modifiable and non-modifiable risk factors. Family history of atopy, urbanization, air pollution, tobacco smoke, obesity, early-life respiratory infections, indoor dampness and mould, and altered patterns of microbial exposure are important determinants. Recognition of these factors can support prevention, earlier diagnosis and individualized counseling for families.

Keywords: children, allergy, asthma, allergic rhinitis, atopic dermatitis, prevalence, risk factors, environment.

Introduction

Allergic diseases in childhood are clinically diverse but biologically related conditions characterized by inappropriate immune responses to otherwise harmless environmental substances. Asthma, allergic rhinitis and atopic dermatitis often coexist and may develop sequentially during childhood, a pattern traditionally described as the "atopic march." Their importance extends beyond symptoms: persistent allergy can disturb sleep, impair school performance, restrict physical activity and increase health-care use. International surveys have shown wide geographic variation in the prevalence of asthma, allergic rhinoconjunctivitis and eczema, suggesting a major influence of environmental and lifestyle factors in addition to genetic predisposition (1,2).

Asthma is the most common chronic disease in children according to the World Health Organization and remains underdiagnosed and undertreated in many low- and middle-income settings (3). Allergic rhinitis is also highly prevalent and frequently coexists with asthma, while atopic dermatitis affects a substantial proportion of children, especially in early life (4,5). Understanding the distribution and risk factors of these conditions is therefore important for both clinical pediatrics and preventive public health.

Main Body

The prevalence of pediatric allergic disease varies by region, methodology and age. The International Study of Asthma and Allergies in Childhood (ISAAC) demonstrated substantial between-country variation and changing trends over time in symptoms of asthma, allergic rhinoconjunctivitis and eczema (1). More recent meta-analytic evidence estimates the overall prevalence of childhood asthma at approximately 10%, although regional estimates differ markedly and can be considerably higher in some populations (6). Allergic rhinitis is one of the most frequent pediatric allergic disorders

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and its prevalence tends to increase with age, while atopic dermatitis is particularly common in infancy and preschool years (4,5). These patterns indicate that allergy is not a single uniform epidemic but a group of diseases shaped by local environment, urbanization and patterns of exposure.

Genetic predisposition is one of the strongest non-modifiable determinants. A parental history of asthma, allergic rhinitis, eczema or other atopic disease increases the probability that a child will develop allergic manifestations. Meta-analytic data on preschool allergic rhinitis show substantially higher risk in children whose parents have allergic rhinitis, asthma or eczema (7). Genetic susceptibility alone, however, cannot explain the rapid changes in prevalence observed over recent decades. The interaction between genes and the environment is therefore central to contemporary models of pediatric allergy.

Environmental tobacco smoke is a major preventable risk factor. Prenatal and postnatal exposure can affect lung development, promote airway inflammation and worsen asthma control. The World Health Organization identifies tobacco smoke, indoor and outdoor air pollution, mould and other inhaled irritants as important contributors to asthma development or exacerbation (3,8). Children living near dense road traffic or in areas with elevated particulate matter and other pollutants may experience increased respiratory symptoms and a higher probability of asthma, especially when genetically susceptible.

Indoor environmental conditions also matter. Dampness and visible mould have been associated with allergic rhinitis and asthma, while house-dust mites, cockroach allergens, animal dander and pollens can trigger symptoms in sensitized children. A systematic review of allergic rhinitis and asthma risk factors identified associations with traffic-related pollution, dampness and mould, parental atopy and several early-life exposures (9). These findings support a practical approach that combines accurate diagnosis with assessment of the child's home, school and neighborhood environment rather than focusing only on medication.

Early-life factors influence immune maturation and may alter later allergy risk. Prematurity, low birth weight, cesarean delivery, lack of breastfeeding, early antibiotic exposure and recurrent viral respiratory infections have been linked in observational studies to increased asthma or allergic disease risk, although the strength and causality of these associations vary. A recent meta-analysis of childhood asthma identified prematurity, cesarean section, absence of breastfeeding, obesity and parental smoking among factors associated with increased prevalence (6). Such findings should be interpreted carefully because many exposures cluster with socioeconomic and environmental conditions.

The hygiene hypothesis, first formulated from epidemiological observations linking smaller family size with hay fever, proposed that reduced microbial exposure in early childhood may alter immune development and increase susceptibility to allergy (10). Current understanding is more nuanced: the diversity and timing of microbial exposures, microbiome development, diet, antibiotic use and contact with natural environments may all contribute. This concept does not imply that poor hygiene is desirable; rather, it emphasizes that immune maturation depends on balanced exposure to a diverse microbial environment.

Obesity is another increasingly important factor. Excess adiposity is associated with systemic inflammation, altered lung mechanics and a higher risk of asthma in childhood. Diets rich in highly processed foods may also cluster with obesity and other lifestyle factors. Conversely, regular physical activity, avoidance of tobacco smoke and maintenance of healthy body weight are practical measures with broader health benefits. For children with established allergic disease, identification of specific

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triggers should be individualized, because unnecessary broad allergen avoidance may reduce quality of life without benefit.

Prevention and early detection require a family-centered approach. Clinicians should ask about family history of atopy, recurrent wheeze, nighttime cough, seasonal nasal symptoms, persistent itching or eczema, food-related reactions, tobacco exposure, damp housing and pets. Asthma diagnosis should be based on a compatible symptom pattern and, when age permits, objective assessment of variable airflow limitation. Allergic rhinitis is diagnosed clinically and may be supported by allergy testing when results are likely to change management. Atopic dermatitis is primarily a clinical diagnosis. Education regarding inhaler technique, adherence, skin care, allergen avoidance when clinically relevant and emergency planning for severe allergy is essential (3,4).

Conclusion

Allergic diseases are common throughout childhood, but their prevalence differs substantially across populations. Asthma, allergic rhinitis and atopic dermatitis arise from interactions between inherited susceptibility and environmental exposures. Family history, tobacco smoke, air pollution, indoor dampness and mould, obesity, urbanization and selected early-life factors are repeatedly associated with increased risk. Prevention should prioritize modifiable exposures, especially smoke and air pollution, while clinical care should focus on early recognition, evidence-based diagnosis and individualized trigger management. Continued epidemiological surveillance is necessary because the burden and pattern of pediatric allergy continue to change with urbanization, climate, lifestyle and environmental conditions.

References:

1. Asher MI, Montefort S, Björkstén B, Lai CKW, Strachan DP, Weiland SK, Williams H; ISAAC Phase Three Study Group. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood. Lancet. 2006;368(9537):733–743. doi:10.1016/S0140-6736(06)69283-0.
2. Global Asthma Network. The Global Asthma Report 2022. Auckland: Global Asthma Network; 2022.
3. World Health Organization. Asthma. Geneva: WHO; 2026.
4. Licari A, Magri P, De Silvestri A, Giannetti A, Indolfi C, Mori F, et al. Epidemiology of allergic rhinitis in children: a systematic review and meta-analysis. J Allergy Clin Immunol Pract. 2023;11(8):2547–2556. doi:10.1016/j.jaip.2023.05.016.
5. Nutten S. Atopic dermatitis: global epidemiology and risk factors. Ann Nutr Metab. 2015;66(Suppl 1):8–16. doi:10.1159/000370220.
6. Zhou W, Tang J. Prevalence and risk factors for childhood asthma: a systematic review and meta-analysis. BMC Pediatr. 2025;25(1):50. doi:10.1186/s12887-025-05409-x.
7. Si N, Chang W, Cheng F, Wang Y, Suo L, Zhao C. Risk factors for allergic rhinitis in preschool children: a meta-analysis and systematic review. BMC Pediatr. 2025;25(1):611. doi:10.1186/s12887-025-05906-z.
8. World Health Organization. Chronic respiratory diseases: key risk factors and prevention. Geneva: WHO; 2025.
9. Testa D, Di Bari M, Nunziata M, De Cristofaro G, Massaro G, Marcuccio G, Motta G. Allergic rhinitis and asthma assessment of risk factors in pediatric patients: a systematic review. Int J Pediatr Otorhinolaryngol. 2020;129:109759. doi:10.1016/j.ijporl.2019.109759

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