Allergies in a Pediatric Population

Reviewed by:

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Introduction[1]

Allergic diseases affect approximately 30-35% of children, and their prevalence has been rising in recent years. There is a strong correlation between allergen exposure in infants and young children and the expression of atopic diseases in later life. During pregnancy, the developing fetus is exposed to the TH2-dominant environment of the placenta and at birth, a newborn's immune system remains biased toward TH2-type immunity.

While genetic factors partly influence the persistence of a TH2-dominant pattern, environmental factors play a significant role in driving the shift toward a TH1-dominant response. Delayed maturation of the TH1 immune response, which typically occurs during the first 12-18 months, increases susceptibility to developing allergies and asthma later on. It has been hypothesized that one of the reasons for the significant increase in allergic diseases in developed countries is hygiene and a relative lack of 'TH1-inducing' infections during infancy. Also, antibiotic therapy during infancy might be correlated with an elevated risk of allergy development. Management comprises the identification of 'at risk' children, the avoidance of potential dietary and inhalant allergens in early life, and the identification of evolving allergic diseases.

Food Allergies and Intolerance

Food allergies are a significant clinical concern due to their high prevalence in early childhood and the potential for life-threatening reactions. Adverse reactions to foods can be broadly classified into two categories:

- Non-immunological reactions (Food intolerances)
- Immunological reactions (Food allergies)

The prevalence of IgE-mediated food allergies is uncertain, ranging from 3% to 7.5%, with higher rates typically observed in younger children. Approximately 1.5% of infants experience milk allergy during their first year of life. Among these, 15% will retain their sensitivity into adolescence, while 35% may develop allergies to other foods. The development of food allergies in atopic children is influenced by genetic predisposition, the allergenicity of specific foods, and the timing of exposure. These allergies are often self-limiting and usually resolve within a few years when managed with appropriate elimination diets.

Anaphylaxis

It is an acute, severe allergic reaction resulting from the rapid release of pharmacologically active mediators from tissue mast cells. Management involves making the parent and patient aware of the potential risks of exposure. The foods to which the patient is highly allergic should be strictly avoided. Patients and parents should be educated about how to read food labels and if there is doubt as to what the food contains, it should be avoided.

Delayed Immunological Reactions (Non-IGE Dependent)

In enterocolitic disorders of infancy, symptoms such as irritability, persistent vomiting, and diarrhea typically develop 1-3 hours after feeding. Continued exposure to the triggering food can lead to more severe manifestations, including bloody diarrhea, anemia, abdominal distention, and failure to thrive. Hypotension occurs in approximately 15% of cases and may be accompanied by metabolic acidosis. In young children, cow's milk or soy-based formulas are the primary triggers of enterocolitic disorders. In older children, common culprits include eggs, wheat, rice, oats, peanuts, tree nuts, chicken, turkey, and fish.

Atopic Dermatitis

Atopic dermatitis (AD) typically begins in early infancy and affects approximately 10% of the pediatric population. It is a complex, chronic inflammatory skin condition identified by intense pruritus, a relapsing course, distinctive skin distribution, and specific diagnostic criteria. AD manifests in 60% of cases before one year of age and in 85% of cases by the age of five in those predisposed to the condition.

Asthma

Viral infections have been shown to increase airway hyperresponsiveness and are frequently associated with acute asthma exacerbations in children. Passive smoking significantly impacts the frequency of asthma episodes, as evidenced by increased hospital admissions during the first year of life. The primary risk factor for transient infant wheezing appears to be maternal smoking during pregnancy. Also, early exposure to high levels of house dust mites in the first year of life is strongly associated with an increased risk of asthma development. Understanding a child's home, daycare, and school environments and implementing targeted environmental control measures form the cornerstone of effective asthma management.

Allergic Rhinitis

Allergic rhinitis (AR) is a significant cause of morbidity in children. Many children initially present with chronic nasal congestion or recurrent upper respiratory infections, often leading to repeated treatments with cold medications and/or antibiotics. Over time, symptoms may shift to a more seasonal pattern, revealing their allergic origin. Antihistamines effectively reduce sneezing, itchiness, nasal secretions, and itchy eyes associated with rhinitis. For children with significant nasal congestion, combining an oral decongestant and an antihistamine may offer better relief. In children, first-generation antihistamines tend to cause less sedation compared to adults.

Bilastine in Pediatric Allergies: Efficacy, Safety, and Clinical Applications in Children

Due to histamine's key role in allergic responses, many allergic conditions, such as allergic rhinoconjunctivitis and urticaria, are managed with H1-antihistamines. First-generation H1-antihistamines are associated with significant anticholinergic and sedative effects, as well as interactions with various medications. Modern second-generation H1-antihistamines are preferred as first-line treatments for AR and urticaria since they cause little to no sedation, lack anticholinergic effects, and improved safety profiles.[2]

Oral second-generation H1-antihistamines, such as bilastine, are recommended as first-line treatments for AR and chronic urticaria (CU) in both adults and children. The EAACI/ARIA guidelines outline the key attributes of an ideal oral H1-antihistamine, and bilastine meets the EAACI/ARIA standards for the effective and safe treatment of AR.[2]

Bilastine is a potent and highly selective oral H1-antihistamine. It is effective in the treatment of allergic rhinoconjunctivitis and CU in adults (at a dose of 20 mg once daily) and children aged 2–11 years (at a dose of 10 mg once daily), is generally well-tolerated and improves QoL. Bilastine demonstrated excellent efficacy with a rapid onset and prolonged duration of action. It is well-tolerated, with minimal sedative effects and a minimum risk of drug-drug interactions.[2] Clinical trials were conducted in patients with perennial and seasonal allergic rhinoconjunctivitis or urticaria including 198 patients aged 12 to 18 years wherein 81 received bilastine 20 mg, with 68 patients continuing treatment for 12 months. The findings confirmed that bilastine 20 mg once daily was effective and safe for this age group.[2]

According to the extensive research of pharmacological and clinical profiles, bilastine is an effective, well-tolerated and safe non-sedating H1-antihistamine for the management of allergic disorders, including rhinoconjunctivitis and urticaria, in adults, adolescents and children.[3]

Combination of Antihistamines and Leukotriene Receptor Antagonist in Allergic Rhinitis[4]

Montelukast, a leukotriene receptor antagonist, plays a crucial role in the pharmacological management of allergic rhinitis by addressing inflammation-related symptoms. Its effectiveness is often enhanced when used in combination with antihistamines, offering broader symptomatic relief through the modulation of multiple inflammatory pathways. A combination of Montelukast with Bilastine may lead to a faster onset of action and prolonged symptom control, particulary in pediatric patients, making it a promising therapeutic approach for allergic rhinitis management.

The long duration of action, efficacy, low sedation, and low-performance impairment of second-generation antihistamines particularly bilastine make it an attractive therapeutic drug for allergy management. Bilastine has demonstrated strong efficacy in both seasonal and perennial allergic rhinitis, representing the progress in antihistamine research regarding both effectiveness and safety. Clinical trials have consistently shown its effectiveness in allergic rhinitis management. When compared to other antihistamines, it does not enhance the CNS depressant effects of lorazepam or increase the effect on the CNS, as seen with cetirizine treatment. This favorable efficacy-safety balance is particularly beneficial in cases requiring higher doses, such as chronic urticaria, where up to four times the standard dose may be needed. Bilastine

represents the advancement of antihistamine research, highlighting both efficacy and safety.[5]

The combination of bilastine and montelukast therapy exhibits a synergistic effect, targeting both early- and late-phase allergic reactions in patients with allergic rhinitis. This dual-action treatment is beneficial for managing AR and mild-to-moderate asthma. Studies indicate that combining leukotriene receptor antagonists with oral H1-antihistamines enhances therapeutic efficacy against daytime and composite nasal symptoms, such as rhinorrhea, sneezing, and itching. Patients with perennial AR may derive greater benefits from LTRA and H1-antihistamine combination therapy compared to H1-antihistamines alone. Experts highlight that bilastine-montelukast therapy is a valuable option for particularly those with hyperreactive airway diseases like asthma, where both drug classes are necessary for optimal outcomes.[6]

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