Respiratory Allergies (Allergic Rhinitis, Sinusitis, Pharyngitis, Tracheitis and Allergic Obstructive Bronchitis) in Children

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Abstract

Respiratory allergic disorders are among the most common chronic illnesses in children and significantly affect quality of life, school performance, and sleep. These disorders include allergic rhinitis, allergic sinusitis, allergic pharyngitis, allergic tracheitis, and allergic obstructive bronchitis. They result from hypersensitivity reactions of the respiratory tract to environmental allergens such as pollen, dust mites, molds, and animal dander. The inflammatory process may involve the upper and lower airways, often leading to recurrent symptoms and progression towards asthma if untreated. Early diagnosis and appropriate management are essential to prevent complications and improve long-term respiratory health in affected children.

Keywords: *respiratory allergy; allergic rhinitis; sinusitis; pharyngitis; tracheitis; allergic obstructive bronchitis; children; pediatric allergy.*

1. Introduction

Respiratory allergies in childhood are increasingly common worldwide. Children are particularly vulnerable because their immune and respiratory systems are still developing, and early allergic sensitisation can have lasting consequences for airway health. Allergic inflammation may involve the nose, paranasal sinuses, pharynx, trachea, and bronchi, either in isolation or simultaneously.

These disorders often coexist and may represent a continuum of airway inflammation described by the united airway concept, in which inflammation in one part of the respiratory tract is mechanistically linked to inflammation in another. Understanding this relationship is essential for designing effective, comprehensive management strategies.

2. Allergic Rhinitis (Hay Fever)

2.1 Definition

Allergic rhinitis is an IgE-mediated inflammatory disorder of the nasal mucosa triggered by exposure to specific allergens. It is classified as seasonal (intermittent) or perennial (persistent), depending on the nature of the causative allergen.

2.2 Common Allergens

Principal triggers include airborne pollens (trees, grasses, weeds), house dust mites, mold

spores, pet dander (cats, dogs), and cockroach allergens. Seasonal rhinitis is most commonly driven by outdoor pollens, while perennial rhinitis is typically caused by indoor allergens present throughout the year.

2.3 Clinical Features

Cardinal symptoms are sneezing, nasal itching, rhinorrhoea (watery discharge), and nasal congestion. Additional features include mouth breathing, postnasal drip, dark periorbital discolouration (allergic shiners), and the allergic salute — a characteristic upward nasal rubbing gesture in children.

2.4 Diagnosis

Diagnosis is established through clinical history, nasal examination, skin prick testing to a panel of relevant allergens, and measurement of serum specific IgE. The Allergic Rhinitis and its Impact on Asthma (ARIA) classification guides severity assessment and treatment selection.

2.5 Management

First-line treatment includes allergen avoidance, nasal saline irrigation, oral or intranasal antihistamines, and intranasal corticosteroids — which are the most effective class of medication for persistent rhinitis. Leukotriene receptor antagonists (e.g. montelukast) may be used as adjunctive therapy, particularly when allergic rhinitis coexists with asthma.

3. Allergic Sinusitis in Children

3.1 Definition

Allergic sinusitis is inflammation of the paranasal sinuses resulting from persistent allergic mucosal oedema and impaired mucociliary clearance. It frequently develops as a complication of undertreated allergic rhinitis.

3.2 Pathophysiology

Allergic swelling of the nasal mucosa obstructs the sinus ostia, impeding drainage. This leads to mucus retention, increased intrasinus pressure, and a secondary elevation in infection risk. The same Th2-mediated inflammatory cascade that drives rhinitis is operative in the sinus mucosa.

3.3 Clinical Features

Symptoms include facial pressure or pain, nasal blockage, thick or discoloured mucus discharge, headache, chronic cough (particularly nocturnal), and halitosis. In children, symptoms may be less localised than in adults and facial pain is often absent.

3.4 Diagnosis

Diagnosis is based on clinical evaluation and nasal endoscopy. Imaging (CT of the paranasal sinuses) is reserved for cases unresponsive to initial treatment or where complications are suspected. Allergy evaluation should be performed in all children with recurrent or chronic sinusitis.

3.5 Treatment

Management prioritises treatment of the underlying allergic rhinitis with intranasal corticosteroids and saline irrigation. Antihistamines may provide supplementary benefit. Antibiotics are reserved for confirmed bacterial superinfection and should not be used for uncomplicated allergic sinusitis.

4. Allergic Pharyngitis

4.1 Definition

Allergic pharyngitis is inflammation of the pharyngeal mucosa caused by direct allergen exposure or by postnasal drip from concomitant allergic rhinitis. It is frequently under-recognised as a distinct allergic entity in children.

4.2 Causes

Common triggers include inhaled allergens such as dust, pollens, and animal dander, as well as passive exposure to tobacco smoke and indoor chemical irritants. Postnasal drip carrying allergen-laden mucus into the pharynx is the predominant mechanism in children with allergic rhinitis.

4.3 Clinical Features

Symptoms include persistent throat itching or tingling, dryness, mild throat discomfort, frequent throat clearing, and chronic cough without evidence of infection. Fever and purulent exudate — features suggesting bacterial pharyngitis — are absent.

4.4 Treatment

Management focuses on adequate hydration, identification and avoidance of triggers, antihistamines for symptomatic relief, and optimal control of concurrent nasal allergy to reduce postnasal drip. Antibiotics are not indicated in the absence of bacterial infection.

5. Allergic Tracheitis

5.1 Definition

Allergic tracheitis is an inflammatory condition of the tracheal mucosa arising from allergic irritation. It may occur as an isolated entity or in the context of broader upper airway allergic disease.

5.2 Symptoms

Characteristic features include a dry, persistent or tickling cough, hoarseness, a sensation of tightness or irritation in the central chest, breathing discomfort, and nocturnal cough that may disturb sleep. The absence of fever and productive sputum distinguishes allergic tracheitis from infectious causes.

5.3 Management

Treatment includes humidification of inspired air, allergen control in the home environment,

antihistamines, and — when significant airway irritation or bronchospasm is present — short-acting bronchodilators. Control of coexisting upper airway allergy is essential.

6. Allergic Obstructive Bronchitis in Children

6.1 Definition

Allergic obstructive bronchitis is a reversible inflammatory disorder of the bronchi with recurrent episodes of airway narrowing triggered by allergic sensitisation. It occupies an intermediate position between isolated bronchitis and asthma and may evolve into established asthma if inadequately managed.

6.2 Common Causes

Principal triggers include house dust mites, viral respiratory infections (which can unmask or amplify allergic sensitisation), pollens, environmental smoke, and animal dander. Viral-triggered wheezing in early childhood is closely associated with subsequent development of persistent asthma.

6.3 Clinical Features

Episodes are characterised by wheezing, persistent cough, shortness of breath, chest tightness, and audible noisy breathing. Symptoms are typically reversible between episodes and respond to bronchodilator therapy, distinguishing this condition from fixed airway obstruction.

6.4 Diagnosis

Evaluation encompasses detailed clinical history, chest auscultation, spirometry with bronchodilator reversibility testing in children old enough to cooperate (generally from five years), and allergen-specific testing. A trial of bronchodilator therapy with documented objective response supports the diagnosis.

6.5 Treatment

Management includes short-acting beta-2 agonists (e.g. salbutamol) for acute bronchospasm, inhaled corticosteroids for persistent or recurrent disease, comprehensive allergen avoidance, and close monitoring for progression towards asthma. Parents should be counselled on early recognition of deteriorating symptoms and appropriate escalation of care.

7. Complications

Untreated or inadequately managed respiratory allergic disorders may result in a range of complications, including:

- Sleep disturbance and daytime fatigue secondary to nocturnal symptoms
- Impaired school performance and cognitive function
- Recurrent upper and lower respiratory tract infections
- Chronic mouth breathing leading to craniofacial developmental changes
- Progression of allergic obstructive bronchitis to established, persistent asthma
- Impaired growth in children with severe, chronic allergic airway disease

8. Prevention

Preventive strategies with evidence of clinical benefit include:

- Rigorous indoor dust control and use of allergen-impermeable mattress and pillow covers
- Strict avoidance of passive tobacco smoke exposure
- Reduction of indoor allergen burden through regular ventilation and humidity control
- Breastfeeding for at least four months to support immune system development
- Adequate nutrition including diverse dietary intake in early childhood
- Early initiation of pharmacological allergy treatment to prevent disease progression

9. Conclusion

Respiratory allergic disorders — including allergic rhinitis, sinusitis, pharyngitis, tracheitis, and allergic obstructive bronchitis — are common, frequently overlapping conditions in childhood that carry a significant burden of morbidity when poorly managed. The united airway concept underscores the importance of evaluating and treating the respiratory tract as a functional whole rather than addressing each anatomical site in isolation.

Early, accurate recognition and stepwise evidence-based management can substantially reduce symptoms, prevent complications, and improve quality of life. Coordinated care between pediatricians, allergists, and respiratory specialists is important for achieving optimal outcomes, particularly in children with multi-system or treatment-refractory disease.

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