Allergic rhinitis-an overview of a common disease

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Abstract

Allergic rhinitis (AR) is the most common chronic disease in childhood and yet is often ignored and/or misdiagnosed. It can present as part of the atopic spectrum of disorders and can affect not only the nose but also its connections, manifesting often with a multiplicity of symptoms, sometimes atypical. If uncontrolled or inappropriately treated, AR can severely impair quality of life for children and their families. Growing evidence of its association with bronchial asthma is emerging: both as a risk factor for asthma development and a major factor in exacerbations. This article aims to give advice about diagnosis and management of this important, common condition to generalists who will encounter it frequently in their clinical practice.

The use of evidence-based guidelines for AR therapy results in improved disease control. Current management is based on avoidance of triggering allergen(s), non-sedative anti-histamines for mild disease, and use of non-systemically bioavailable nasal steroids for moderate/severe disease. The use of an intranasal combined preparation of fluticasone propionate and azelastine for those unresponsive to these measures is under investigation. Allergen-specific immunotherapy, currently recommended for severe cases, is the only treatment modality potentially able to alter long term not only disease severity, but also progression. Immunotherapy is often unavailable to deserving patients and concern regarding risk/benefit and acceptability can hamper its use in children. Evidence on efficacy and safety of the more child-friendly sublingual route of administration is emerging, however further well-designed paediatric studies are needed. Education of patients, carers and of practitioners in the nature of AR, the possible need for long term concordance with therapy and the optimal use of this is a vital part of disease management.

Keywords allergic rhinitis; diagnosis; immunotherapy; intra-nasal corticosteroids; quality of life; skin prick test; specific IgE; therapy

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Introduction

Allergic rhinitis (AR) is the commonest chronic disease of childhood and a major health problem. Its prevalence varies worldwide with the highest levels in developed countries. It affects one in four school children (6–7 year olds) and one in two teenagers (13–14 year olds). Time trend analysis by phase III of the International Study of Asthma and Allergies in Childhood (ISAAC) has detected a slight continuing worldwide increase in the prevalence of AR. This was most evident in the older children and in countries undergoing rapid socio–economic transition, suggesting that environmental impact on allergy development is not limited to the first few years of life.

The aetiology of AR is multi-factorial with genetic and environmental factors (tobacco smoke, pollution, infections, diet) contributing. In accordance with the concept of the "atopic march" AR often follows atopic dermatitis which manifests in the first few months or years of life. Early childhood eczema may promote subsequent allergen sensitization: malfunctioning of the skin barrier may allow uptake of environmental allergens via skin antigen presenting cells, with subsequent sensitization and thereafter migration of sensitized T-cells to the nose and airway. This has been demonstrated in a murine model. Thus early management of eczema may reduce the prevalence of environmental allergen sensitization and prevent subsequent rhinitis and asthma. However AR also occurs *de novo* in children without previous allergic manifestations and sensitization via the nose is a possibility. Local IgE production without evidence of systemic sensitization has been reported.

AR impacts on quality of life and educational achievement

Although not traditionally considered a severe disease AR has a considerable impact on the overall physical and psychological wellbeing of affected children. Family dynamics are also disrupted. Uncontrolled AR has been shown to affect children's quality of sleep: impairing daytime concentration and school performance and attendance. In a case–control study conducted in the UK on 1834 15–17 year old students sitting GCSE examinations at the peak of the grass pollen season, pupils who dropped at least one grade in one of the three core subjects (English, Maths and Science) were more likely to have symptomatic AR with an odds ratio of 1.43 when compared to the controls. On-going allergic inflammation significantly reduces Rhinitis Health Related Quality of Life (HRQL) with a direct correlation with allergen exposure. Symptomatic treatment with older generation sedating anti-histamines further hampers examination outcomes and the overall ability of children to learn.

Definition

AR is an inflammatory process affecting the lining of the nose. In sensitized subjects exposure to both outdoor and indoor environmental allergens triggers an immunoglobulin E (IgE) – mediated inflammation characterized by an early and late hypersensitivity response. Histamine is the primary mediator of the early response whilst inflammation involving eosinophils and T-lymphocyte recruitment underlies the late phase response (Figure 1). Local nasal IgE production has been advocated to explain the

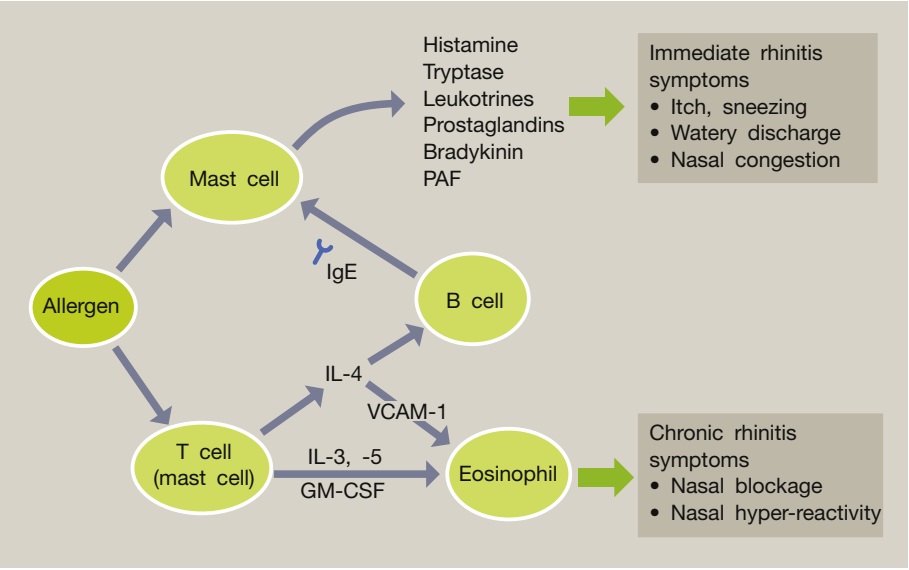

Figure 1 Illustration of the allergic early and late phase hypersensitivity response Scadding GK et al. Clinical and Experimental Allergy 2008.

observation of typical clinical features of AR in a subgroup of patients with no evidence of systemic IgE sensitization, but who respond positively to nasal allergen challenge Paediatric studies suggest that this also occurs in children.

Presentation

Classically AR is characterized by anterior or posterior watery rhinorrhoea (causing sniffing), sneezing, nasal blockage (mouth breathing) and/or itching, the latter often leads to nose rubbing (the allergic salute). Ocular symptoms are frequently associated, particularly in pollen allergy. They include eye itching, irritability, lacrimation, redness and conjunctival injection with occasional periorbital oedema and, in the most severe cases, corneal involvement (atopic keratoconjunctivitis and vernal keratoconjunctivitis). Allergic shiners (dark eye shadows beneath the lower eye lid), caused by blood and or fluid accumulation in the infraorbital groove, are also typical of childhood AR and in a recent study their degree of darkness has been associated with chronicity and severity of disease. Allergic children tend to have an extra skin fold or line under their lower eyelids (Dennie—Morgan lines). Frequent throat clearing or hoarseness can be another feature.

The timing of symptoms in relation to allergen exposure (i.e. specific season or animal) is of primary importance as it is typical of AR (Table 1).

Differential diagnosis

Classical AR is relatively easy to recognize but in children can have a multiplicity of presentations, including via associated co-morbidities. The age of the child can also be relevant to the disease manifestation. In pre-school children for example nasal blockage and mouth breathing can sometimes be the only presenting symptom and recurrent viral colds and/or adenoidal hypertrophy are frequent misdiagnoses. Upper respiratory tract infections are more frequent in the first few years of life, whilst AR is more common in school children and adolescents (Table 2).

It is important to consider rarer conditions that can mimic AR. Primary ciliary dyskinesia (PCD) should be suspected when chronic rhinitis with muco-purulent secretion manifests from

Classic signs and symptoms of AR

- Paroxysmal sneezes
- Watery rhinorrhoea
- Nasal itch
- Nasal blockage
- Eye symptoms (itch, irritability, lacrimation, redness and periorbital oedema)
- Itchy throat and palate
- Symptoms present on allergen exposure
- Response to anti-histamines

Table 1