Patients can find the symptoms of allergic rhinitis disruptive and distressing. This article outlines their causes and triggers, and the main treatment options.

Managing allergic rhinitis

**In this article...**
- An outline of the mechanisms of allergy
- How to diagnose allergic rhinitis
- Management options for hay fever

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An allergic reaction can occur at any age and present itself in many organs. Over the past five decades, the understanding of immunological mechanisms and pharmacological management of allergy has increased. This article outlines the mechanisms of allergy, its diagnosis and management in the context of the upper respiratory tract, and hay fever.

Allergic reactions can present at any age and in many forms. They can range from the mildly inconvenient to the potentially fatal anaphylactic reaction. An understanding of the mechanisms causing allergic reactions will enable nurses to help patients to manage allergic symptoms and to know when to refer them for specialist intervention.

**Mechanisms of allergic reactions**

An allergic reaction (Greek “allo” = altered; “erg” = reaction) occurs when the body overreacts (that is, is hypersensitive) when defending itself against a perceived threat such as pollen, which would otherwise be harmless. Types of hypersensitivities and allergies are distinguished by the timing of their symptoms and whether antibodies or T cells are the principal immune element involved (Box 1).

Atopy is a predisposition to become sensitised and produce immunoglobulin E (IgE) antibodies in response to exposure to allergens that commonly occur in the environment. Atopic people can develop IgE-mediated allergic diseases including asthma, rhinoconjunctivitis or eczema (Johansson et al, 2001). Box 2 describes key terms used.

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**BOX 1. TERMINOLOGY**

- **Hypersensitivity** causes objectively reproducible symptoms or signs, initiated by exposure to a defined stimulus at a dose tolerated by healthy people

- **Atopy** is a personal or familial tendency to produce IgE antibodies in response to low doses of allergens, usually proteins, and to develop typical symptoms such as asthma, rhinoconjunctivitis or eczema/dermatitis

- **Allergy** is a hypersensitivity reaction initiated by immunological mechanisms

**BOX 2. TYPES OF HYPERSENSITIVITY**

- **Hypersensitivity IgE-mediated reaction**
  - (allergic reaction)
  - Binding of antigen to IgE on the surface of mast cells causes release of inflammatory mediators
  - Allergy can cause an immediate response such as urticaria, asthma, hay fever or angioedema
  - Anaphylaxis – rapid severe systemic reaction, as in sensitised nut allergy

- **IgM or IgG cytotoxic reaction**
  - Antibody dependent
  - Binding of antibody to cell surface leads to a specific immune response and damage to host cell
  - For example, erythroblastosis foetalis, Goodpasture’s syndrome

- **IgG immune complex reaction**
  - The formation of complexes between antigen and antibody leads to tissue damage as a result of deposition in blood vessels (vasculitis) and activation of inflammatory pathways, for example, in Arthus reactions (to vaccination), rheumatoid arthritis and subacute bacterial endocarditis

- **Cell-mediated reaction**
  - Delayed-type hypersensitivity (DTH)
  - Activation of T cells around the site of the antigen leads to T-cell cytotoxicity and activation of macrophages, causing tissue damage, for example in Mantoux testing, contact dermatitis and coeliac disease

**Symptoms are debilitating and limit activity**

1. Environmental changes influence pollen seasons
2. Rhinitis can be classified as allergic or non-allergic
3. Symptomatic allergic rhinitis should be started promptly
4. Rhinitis and asthma often coexist

**Nursing Practice**

Review

Allergy

**Abstract**

**5 key points**

1. Environmental changes influence pollen seasons
2. Rhinitis can be classified as allergic or non-allergic
3. Symptoms are debilitating and limit activity
4. Treatment should be started promptly
5. Rhinitis and asthma often coexist
The UK prevalence of hay fever and asthma is among the highest in the world (Björkstén et al, 2008; Gupta et al, 2004). It is estimated that 20% of the UK population is at risk of developing hay fever, which rises to 50% if there is a family history of atopy (Punekar et al, 2009; Asker et al, 2006). People may be allergic to more than one form of pollen, and to more than one allergen; such allergy may cause hay fever–type symptoms all year, which is known as perennial rhinitis. This type of rhinitis may be caused by allergy to, for example, animal dander or house dust mite. Those with multiple allergies may suffer from perennial rhinitis with seasonal exacerbations.

Wind-pollinated plants produce higher levels of pollen than insect-pollinated ones. In the UK, the main cause of hay fever is grass pollen, affecting 95% of people with the condition, followed by that from trees, particularly birch (20%), and weeds, particularly nettle. Ragweed, common in the US, Canada and some parts of Europe, produces millions of pollen grains and poses a significant hay fever problem (National Pollen and Aerobiology Research Unit, University of Worcester, undated).

Emberlin (2008) observed a decrease in the severity of the grass pollen seasons in London and Derby over the past 20 years, which appear to relate to changes in land use and the decline in grassland areas.

Alongside this, the effects of climate change mean warmer weather has encouraged grass growth, earlier pollen release, a change in the seasonal distribution of aeroallergens and an extended pollen season. The lengthening of the European pollen season has resulted in moderate pollen counts being recorded into August, where previously the season would have ended by late July. In addition, biological or air pollution stresses such as rising carbon dioxide levels are thought to result in trees producing pollen that is more allergenic (D’Amato, 2002).

History and diagnosis

When a patient presents with allergic symptoms, a history of symptoms and their relationship to exposure should be taken. Past or present personal and family history of allergy-related disorders such as eczema or asthma, which often coexist with rhinitis, should also be documented.

Outside the pollen season, when patients are asymptomatic, the diagnosis is primarily made on history; during the season, both history and examination support diagnosis.

There is usually a relationship between high pollen counts and IgE-mediated rhinitis; symptoms usually appear very shortly after allergen exposure and last for longer than four hours. They consist of itching, eye irritation and excessive discharge of watery fluid from the nose and eyes. On examination, nasal mucosa may appear normal or pale bluish, or swollen with watery secretions in symptomatic patients. The symptoms may be severe enough to cause difficulty in sleeping, working or studying (Walker et al, 2007; Malone et al, 1997).

To help plan treatment, it may be helpful to identify, where possible, the pollen (or pollens) or other aeroallergens to which the patient is sensitive. Skin prick testing (SPT) is easy to perform and rarely causes generalised reactions. SPT for a range of allergens should only be carried out following detailed history-taking. It is useful for:

- Diagnosing allergy;
- Confirmatory evidence (positive, negative) of IgE sensitisation in support of the clinical history (Fig 1);
- Identifying the allergen against which IgE is directed, which is essential for allergen-avoidance measures;
- Educational value – visual reinforcement strengthens concordance with verbal advice.

Patients may have positive SPT but no disease – a positive SPT indicates the presence of IgE antibodies against that allergen but does not indicate clinical sensitivity, so correlating the history with the SPT is essential. The results can be unreliable if patients take certain drugs, such as antihistamines.

Total IgE blood levels do not provide a sensitive enough measure for atopy; a test for allergen-specific IgE antibodies can be requested if SPT is not available or appropriate, for example in patients who:

- Are taking antihistamines or other confounding medications for skin tests;
- Have eczema;
- Have experienced an anaphylactic event within the previous six weeks;
- Are morbibly afraid of skin testing.

Screening is only beneficial if it will influence management by allergy avoidance, or in cases where immunotherapy is to be considered (Walker, 2011).

Differential diagnosis

Infected rhinitis may be caused by viruses or bacteria and is often seen in young children. Non-allergic rhinitis may be of unknown causes and, in rare cases, can be a symptom of underlying systemic disease such as Churg-Strauss disease or Wegener’s granulomatosis. Rhinitis may be a symptom of rhinosinusitis.
Management
It may be extremely difficult or impossible to completely avoid exposure to pollen. However, if a specific allergen or allergens can be identified, patients may be able to avoid or minimise exposure when pollen counts are high, for example by:
- Avoiding passing a field or area where a specific allergen is prevalent;
- Staying indoors with windows and doors closed when particular pollen counts are significantly raised;
- Fitting pollen filters to air vents of cars;
- Washing hair after journeys outside.

Treatment
Treatment consists of non-sedating antihistamines, nasal corticosteroids and anti-inflammatory eye drops (Angier et al, 2010). Other treatments are oral corticos- teroids, leukotriene receptor antagonists, decongestant sprays and immunotherapy. Corticosteroids: these are potent anti-inflammatory agents; for hay fever they are used once or twice daily as a nasal spray, depending on the formulation.

When applied nasally, corticosteroids may reduce the ocular effects of the allergy. The anti-inflammatory action may take some days to have a noticeable effect so, if possible, it should be started 5-7 days before symptoms are due to appear (with hay fever, the start of symptoms is often predictable from experience or from knowledge of when pollens are produced). To avoid nosebleeds, patients should be taught how to use their device (Box 3).

In severe cases, oral corticosteroids may be prescribed. This is most commonly done for short periods for patients whose activities are restricted at a critical time, for example when sitting exams.

Antihistamines: since histamine is the main cause of the allergic rhinitis response, it is not surprising that anti-histamines are an effective therapy for hay fever. However, while they may relieve many symptoms, nasal congestion may persist.

Antihistamines are often used where symptoms of allergic conjunctivitis are present. They normally begin acting within 20-30 minutes, and their action should last for several hours. Non-sedating antihistamines are preferred and may be used in conjunction with a nasal spray.

Mast-cell stabilisers: these may be added to the treatment regimen in the form of eye drops for uncontrollable eye symptoms; they should not be used with contact lenses.

Leukotriene receptor antagonists: these block one part of the inflammatory cascade that is initiated when a sensitised person is exposed to an allergen.

According to the British National Formu- lary (British Medical Association and Royal Pharmaceutical Society, 2012), they may be of benefit in exercise-induced asthma and in those with concomitant rhinitis. Pre-scribers should check the BNF for details on individual drugs.

Decongestant nasal sprays: these can be bought over the counter at pharmacies. They may provide short-term relief but should not be used for more than seven days as they will have a diminishing effect and may cause a rebound exacerbation of symptoms.

Grass pollen immunotherapy: these therapies are effective for those with monosensitive IgE-mediated allergen (proven allergy to grass pollen). Desensitisation is sometimes used in patients who are severely affected and where other treatments have been unsuccessful.

Two types are available: subcutaneous injections; and sublingual immunotherapy tablets. Over a period of weeks, patients are given a series of subcutaneous injections containing an increasing concentration of the allergen, or sublingual immunotherapy tablets over three years to build up immunity. British Society for Allergy and Clinical Immunology guidance (Walker et al, 2011) states that both subcutaneous and sublingual immunotherapy efficacy have been shown to be effective.

BOX 3. HOW TO USE A NASAL SPRAY

- Blow nose before spraying, if blocked
- Prime the spray device according to the manufacturer’s instructions, including removing the cap
- Tilt head slightly forward. Using the opposite hand to the nostril, gently insert the nozzle. This ensures the device is inserted at the correct angle, with the nozzle parallel to the roof of the mouth and tilted away from the septum
- Apply one actuation at a time. Avoid sniffing hard during or after spraying. Sniffing could force the spray into the back of the throat instead of inside the nose where it needs to work
- Repeat the process, remembering to use the opposite hand to the nostril
- Wipe the tip of the spray device with a dry tissue, and replace the cap

Conclusion
The effects of hay fever may range from mildly inconvenient to severely disabling. The condition may impair patients, especially children and young adults, at critical times, for example, during and before school, college or university exams.

The potential effect of hay fever should not be underestimated. A careful history will elucidate the extent of the allergy’s effects, and will allow practitioners to advise and treat patients effectively. NT

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