

Recognising and managing allergic disease in the community

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Allergic disease is the cause of much morbidity, and symptoms can have a significant impact on the individual's quality of life. In some cases, the symptoms are seasonal, but in others allergic disease is a perennial problem. Whichever type of allergy is present, careful management will be required to minimise its impact on the person's quality of life. This article will look at some of the allergic conditions that present in primary care, particularly asthma, and summarise the underlying pathophysiology and how this influences the ways in which allergic disease can be treated and managed by community nurses.

Allergy is the expression of an atopic tendency. Atopic individuals have a predisposition to develop abnormal responses within the immune system to substances which would not normally provoke a reaction in most people (Allergy UK, 2012). Moreover, allergy can occur in many different sites of the body, including the skin, lungs, nose, eyes and gastrointestinal tract. Examples of commonly presenting allergic diseases include asthma, eczema, allergic rhinitis, food allergy and urticaria.

The pathophysiology of allergy

The term 'allergy' is generally used to refer to a response which is linked to immunoglobulin E (IgE). An IgE-mediated allergic response will occur when the atopic individual produces IgE antibodies in response to allergen (Smurthwaite and Durham, 2002). As the allergic reaction gathers pace, other substances such as histamines and leukotrienes are also released. *Figure 1* shows the 'allergic cascade', i.e. the chain reaction of events at the cellular level that result in the symptoms of an allergic reaction, such as constricted airways.

ABSTRACT

Allergic disease and its symptoms, whether seasonal or perennial, can have a significant impact on individuals' quality of life. Asthma, allergic rhinitis, eczema, urticaria and food allergy are among the common allergies that nurses may encounter in the community. This article discusses the causes of allergic disease, the importance of considering allergen avoidance, and the alternative treatment options available.

KEY WORDS

Allergy ♦ Asthma ♦ Urticaria ♦ Eczema ♦ Allergic rhinitis
♦ Anaphylaxis ♦ Food allergy

In IgE-mediated allergy, the reaction to the allergen usually occurs quickly, within 15 minutes of exposure. This may be followed by a late reaction 4–6 hours later, which may potentially persist for days or even weeks (World Allergy Organisation, 2003; Pawankar, 2004). In contrast to IgE-mediated responses, non-IgE mediated allergic reactions are linked to other antibodies such as immunoglobulin G, or cellular immune responses. Non-IgE mediated allergies and food allergies may also occur and may take hours or even days to appear following exposure to an allergen (Motala, 2004). Allergens include substances such as pollens, house dust mites, drugs, stings and foodstuffs including nuts, milk and eggs (*Figure 2*).

The prevalence of allergic diseases has been rising in the UK (Gupta et al, 2007); possible causes for this rise include an increase in pollution and a delay in exposing children to allergens earlier on in life as a result of 'cleaner' lifestyles – the so-called 'hygiene hypothesis' (University of Michigan Health System, 2007). This theory is currently being put to the test by the Enquiring About Tolerance study (www.eatstudy.co.uk) and the Learning About Peanut Allergy study (www.leapstudy.co.uk), which are investigating whether early exposure to hyperallergenic foods can reduce the risk of allergy in the future.

Diagnosing allergic disease

In the 1940s, the importance of history-taking in those with an allergy was already being recognised and discussed (Swineford, 1944). However, more recently, the Royal College of Paediatrics and Child Health (2009) developed a tool that can be used by the clinician to ascertain whether allergy is a likely diagnosis. Although the questionnaire is quite long, it does allow the user to ensure that they have covered the main areas required for a thorough allergy history. Key elements of history-taking are listed in *Table 1*.

It is important to identify any family history of allergy, as according to the UCB Institute of Allergy (2012), a child whose parents do not suffer from allergy has a 15% chance of becoming allergic, whereas if the mother suffers from allergic disease the risk increases to 60%, and if both parents suffer from allergy, the risk increases to 80%.

Asthma

Asthma is a chronic inflammatory condition of the airways. The airways become hyperresponsive to triggers such as

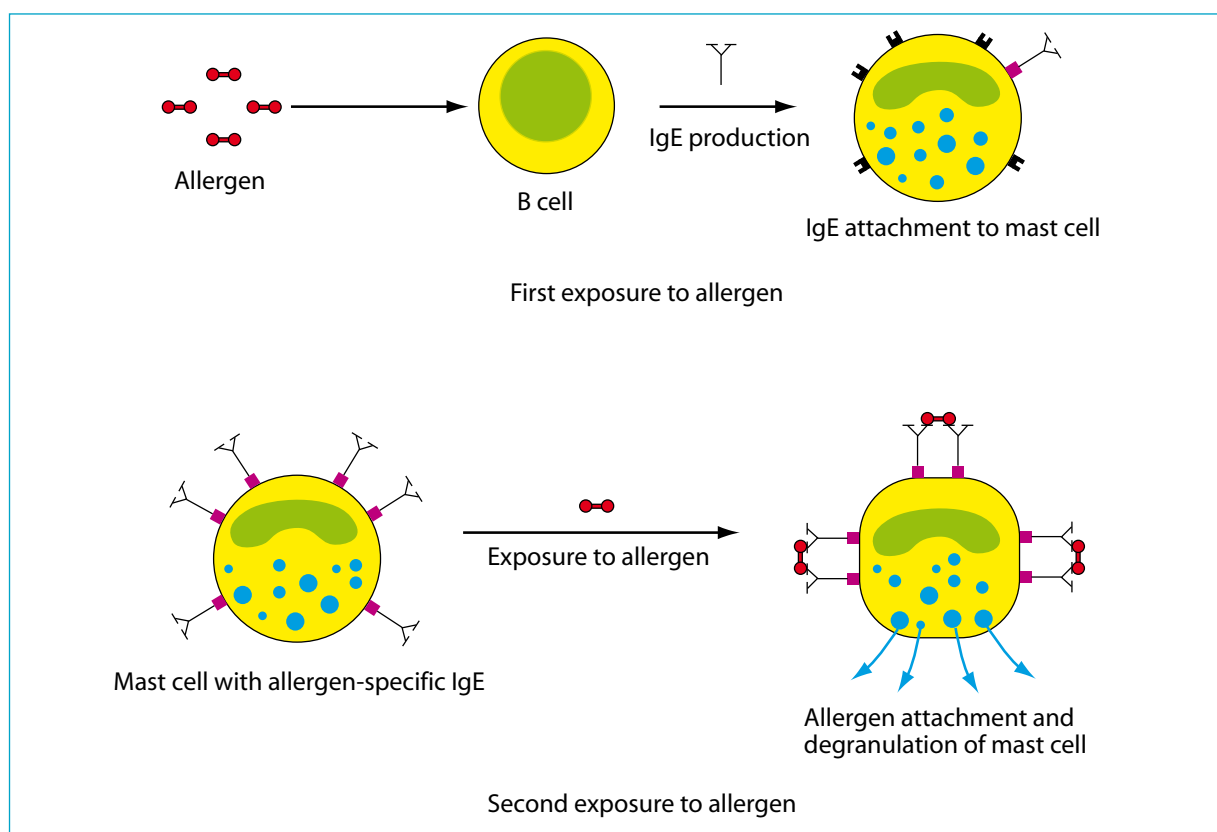


Figure 1. The allergic cascade is triggered on second (and subsequent) exposures to the allergen, resulting in mast cell degranulation and the release of histamines, leukotrienes, and other substances

allergens or viruses, resulting in bronchospasm. This leads to symptoms such as a cough, wheeze, a tight chest and shortness of breath; however, symptoms are usually reversible with medication. The diagnosis is made by taking a careful history, which will identify typical symptoms, often with a background of other allergic diseases in the individual or his/her family. Suspicion of asthma can be confirmed by carrying out lung function tests (spirometry or peak flow readings), which demonstrate variability and reversibility (British Thoracic Society (BTS)/SIGN, 2012).

Asthma has an unnecessarily high level of morbidity and mortality, with the majority of admissions and deaths being avoidable if earlier action had been taken (Asthma UK, 2012). Most cases of asthma could be managed effectively in the community, primarily by the patient but with relevant input from the health professionals working with them. Asthma affects all age groups and may coexist with other conditions, especially as people get older. The inflammation which is the cause of asthma symptoms can generally be controlled by the appropriate use of inhaled corticosteroids, with or without the addition of long-acting bronchodilators (BTS/SIGN, 2012). Treating the inflammation with inhaled corticosteroids should reverse the changes that have occurred within the lungs and resolve symptoms.

According to the BTS/SIGN asthma guidelines (2012) and the Global Initiative for Asthma (GINA) guidelines (2011), the aim of good asthma management should be to enable the individual with asthma to live a normal

productive life with no symptoms, no exacerbations, little or no use of reliever medication, and with (near) normal lung function. Although this may not be achievable for all individuals with asthma, this should not stop us aiming for complete control in most of our patients. Certainly, a well-controlled individual should only need their blue reliever inhaler no more than 2–3 times a week at most. If this gold standard were achieved, one blue reliever inhaler would last almost a year. The importance of using inhaled corticosteroids and other drugs to achieve good control of inflammation and minimal use of reliever medication has been stressed in these guidelines. Assessment of asthma control can be made simply and effectively by using tools such as the Royal College of Physicians' three questions approach:

In the last month:

- ♦ Have you had difficulty sleeping because of your asthma symptoms (including cough)?
- ♦ Have you had your usual asthma symptoms during the day (cough, wheeze, chest tightness or breathlessness)?
- ♦ Has your asthma interfered with your usual activities – e.g. housework, work or school?

If the patient has answered 'yes' to any of these questions, it may be that their asthma is not well-controlled and they should see his/her nurse or GP (Thomas et al, 2009).

Another option is to use the Asthma Control test (ACT), which is available online via the Asthma UK website (www.asthma.org.uk).

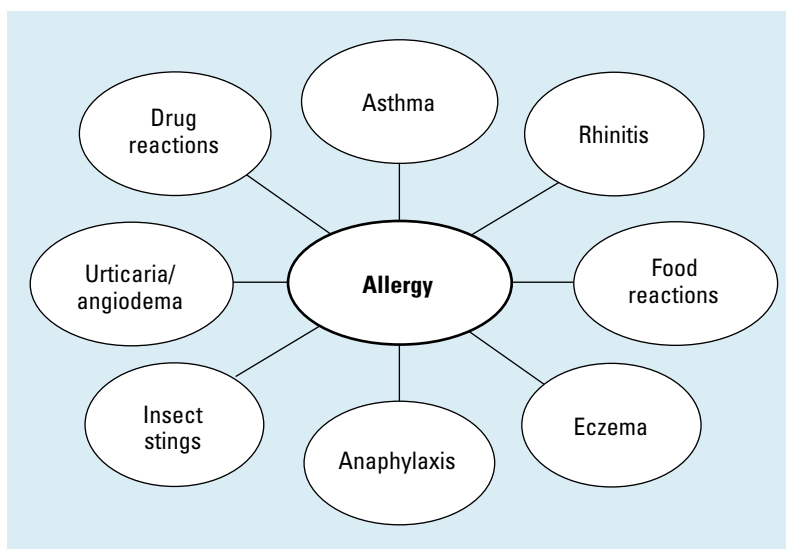


Figure 2. Common presentation of allergy

Table 1. History-taking in suspected allergy

- Are the symptoms typical of allergy: redness, itching and/or swelling?
- Is there an obvious allergic trigger?
- Is there a past history of allergic disease?
- Is there a family history of allergy?
- Time between allergen exposure and symptoms? (Typically <15 minutes)
- Is there more than one organ system involved?

Asthma management

Inhaled steroids are the bedrock of asthma management. Corticosteroids work by suppressing the immune system (Greenstein and Gould, 2009). Drugs in this category include beclometasone, budesonide, and mometasone. They are available in oral, inhaled and topical forms (creams and ointments for eczema and nasal sprays for allergic rhinitis), and the molecule and dose needs to be matched to the severity of the patient's condition. The dose of inhaled steroid used for asthma should be matched to the severity of the asthma symptoms, and doses may be increased or decreased depending on the response. An average starting dose for an adult might be between 400–800 mcg beclometasone (or equivalent).

It is imperative to ensure that the patient can actually use their inhaler device, however, as the dose will be irrelevant if the patient cannot inhale the drug into the lungs. There are many studies showing that inhaler technique in both patients and health professionals is poor. Once control has been achieved and reliever use is minimal, the asthma guidelines suggest stepping down treatment if the individual has been symptom-free for at least 3 months. However, careful consideration should be given to the timing of stepping down medication in patients who are known to suffer from seasonal allergic rhinitis, as the coexistence of these conditions increases the risk of being admitted with an acute exacerbation of asthma by 50% (Price et al, 2005).

Asthma action plans

All patients should have an asthma action plan to allow them to optimise self-management, but also to ensure that they or their carers know when and how to get help. There are many examples of plans available from organisations such as Asthma UK and also from commercial sources. The BTS/SIGN (2012) guidelines have a section on the provision of asthma action plans. Effective ongoing control of asthma with the appropriate medication and the provision of an asthma action plan will significantly reduce the risk of exacerbations and 'asthma attacks'. However, in the event of an acute asthma attack, the use of high-dose bronchodilators and oral steroids is recommended. If patients are showing signs of severe, acute or even life-threatening asthma, they should be admitted as an emergency. These signs include oxygen saturations below 92% and an inability to talk in complete sentences.

Leukotriene receptor antagonists

Leukotriene receptor antagonists (LTRAs) are used predominantly as an add-on in the treatment of asthma. They block the action of leukotriene in the allergic cascade. Leukotrienes are powerful mediators in the allergic response, so blocking them can lead to an improvement in systemic allergic reactions (Busse and Kraft, 2005). Individuals' levels of leukotriene activity vary from person to person, so the benefits of the drugs may not be seen in all patients. Therefore, the effect of a trial of treatment needs to be assessed on an individual basis. Often a short trial of therapy (2 weeks) will be sufficient to allow the benefits to be evaluated. Drugs in this class include montelukast and zafirlukast. LTRAs can be used to treat asthma from age 6 months and can also be used to treat allergic rhinitis within the licensing guidance (Electronic Medicines Compendium, 2012a).

Allergic rhinitis

Allergic rhinitis, which is often accompanied by allergic conjunctivitis, leads to a blocked and/or runny nose and/or eyes resulting from exposure to an allergen. Whereas 10–20% of the general population is affected by allergic rhinitis (Brozek et al, 2010), up to 80% of patients with asthma are known to have nasal symptoms too (Corren, 1997). This is because if one site in the body is affected by allergic disease, then others may be too as the same atopic tendency is expressed in different areas. Moreover, treating disease in one area can impact on overall symptom control. For example, treating the allergic rhinitis can improve not only the allergic rhinitis symptoms, but can also lead to better asthma control (Crystal-Peters et al, 2002).

Allergic rhinitis may respond to an intranasal steroid as sole therapy or in combination with other drugs such as an antihistamine or a leukotriene receptor antagonist (Brozek et al, 2010). This is because drug treatments for allergy can be targeted at specific parts of the allergic cascade; for example, they may be useful in suppressing the immune response (i.e. corticosteroids), or by interfering

with some part of the allergic cascade (e.g. antihistamines or leukotriene receptor blockers).

Eczema

Eczema is a non-infective, inflammatory skin condition that is caused by an inappropriate reaction by the immune system. SIGN (2011) produced a guideline on the management of eczema in primary care that provides a thorough overview of diagnosis and management. Treatment involves the avoidance of triggers where possible, along with the liberal use of emollients at all times, even when the skin appears clear. When the skin flares and becomes inflamed, the use of topical steroids is indicated. In asthma, low-dose inhaled steroid therapy is the basis for long-term management, whereas in eczema, topical steroids should be used to manage an acute flare-up, but have no part to play in ongoing, long-term management. They can, however, be used twice weekly in people with severe atopic eczema with frequent relapses.

Non-steroidal therapeutic options for eczema include tacrolimus and pimecrolimus, which are calcineurin inhibitors. They are non-steroidal topical treatments which are licensed for use in the treatment of moderate-to-severe atopic eczema in patients who do not respond to corticosteroid therapy (Electronic Medicines Compendium, 2012b). The treatment should begin as soon as possible after the skin starts to flare. Each affected region of the skin should be treated until improvement is seen. This usually occurs within 1 week of starting treatment. If no improvement is seen within 2 weeks (tacrolimus) or 6 weeks (pimecrolimus), then other options should be considered.

In 2004, the National Institute for Health and Clinical Excellence (NICE) issued guidance on the need for caution when using calcineurin inhibitors; overall, however, it is recognised that their benefits outweigh the risks when used appropriately by a clinician with expertise in this area. In 2009, tacrolimus was licensed for use as a maintenance therapy, although the mainstay of treatments for eczema and dermatitis remains emollient therapy – people with eczema will often need reminding about this.

Urticaria

Urticaria, also known as 'hives' or 'nettle rash', is caused by the activation of mast cells in response to an allergen, leading to histamine release and a raised, itchy, transient rash. It can be an especially challenging allergic condition to manage, as it has often disappeared by the time the patient is seen. It is also often difficult to identify a causative factor.

Antihistamines may help to relieve symptoms of urticaria. They work by preventing histamine from stimulating H1 receptors. Newer generation antihistamines optimise symptom relief while minimising undesirable side effects such as drowsiness. Recently, a new antihistamine (rupatadine) was introduced to the market. This drug is slightly different in its action in that it not only



Urticaria, also known as 'nettle rash' or 'hives', presents as a raised, itchy, transient rash

acts upon H1 receptors, but also has a unique effect on platelet-activating factor (PAF) receptors. This may offer additional symptom relief for both allergic rhinitis and urticaria (Izquierdo et al, 2003).

Food allergy

In 2011, NICE published its guidance on food allergy in children and young people (NICE, 2011a). According to NICE, approximately 6–8% of children aged 3 years and under are thought to suffer from a food allergy. It is important to recognise that food allergies, although relatively rare, can impact on areas outside the gastrointestinal tract, such as the skin or airways. The NICE (2011a) guidance offers advice on the diagnosis and management of food allergy in people up to 19 years of age. There is a slide set available on NICE's website which gives a useful overview of its recommendations (<http://guidance.nice.org.uk/CG116/SlideSet/ppt/English>).

Anaphylaxis

Anaphylaxis is a severe and potentially life-threatening allergic reaction. NICE (2011b) also produced guidelines on the identification and management of anaphylaxis. The most important treatment intervention in an anaphylactic reaction is the use of an adrenaline/epinephrine pen. There are three types of pen available in the UK – the Anapen, the Epipen, and Jext pen. Provision of pens should always be accompanied by education regarding the recognition of anaphylaxis, use of the pen and advice on seeking further medical help – i.e. always in the case of a suspected anaphylactic reaction, even if the individual has recovered. A late allergic response can lead to a biphasic anaphylactic reaction where one reaction is followed by another several hours later (NICE, 2011b), and this is why it is imperative that anyone who has experienced an anaphylactic reaction should be referred to hospital.

LEARNING POINTS

- ◆ The prevalence of allergic disease is increasing
- ◆ Allergy may be expressed via several of the body's systems, e.g. the skin, the respiratory system, or the gastrointestinal tract
- ◆ A careful history of the patient can help nurses identify allergic disease
- ◆ Steroids are often the cornerstone of allergy management
- ◆ Other drugs may be used to impact on different parts of the allergic cascade, e.g. histamine and leukotriene release, or platelet aggregating factor receptors
- ◆ Allergen avoidance should be implemented wherever possible

Non-pharmacological treatments for allergy

As well as drug therapies to treat allergy, non-pharmacological interventions should include allergen avoidance. Avoidance of a known allergen is an important part of managing allergic disease, but may not always be possible; this is because the allergen may not have been identified or because it is simply unrealistic to avoid it in day-to-day life. An interesting overview of the benefits and disadvantages of allergen avoidance strategies is available from the World Allergy Organisation (Platts-Mills, 2004).

Conclusion

In summary, allergic disease includes asthma, rhinitis, eczema and urticaria. Taking a thorough patient history is important, as signs and symptoms may not be present when the patient is seen. Once the diagnosis has been made, consider whether allergy avoidance is a pragmatic option and offer advice regarding how this can be achieved; then focus treatment on the site – the lungs, nose, skin or other organ. Corticosteroid therapy will form the basis for treating many allergic conditions, but other drugs may be used to complement topical treatment and impact on histamine and/or leukotriene pathways. Along with medication, ongoing education and support should be offered.

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