Allergy avoidance

This article discusses allergy and ways in which allergens can be avoided so that nurses can develop their understanding of the different types of allergy and advise patients appropriately.

AIM AND INTENDED LEARNING OUTCOMES
The aim of this article is to develop nurses' understanding of the different types of allergy, the symptoms caused and how these can best be treated, both by reducing allergen provocation and the use of current medication. After studying the article you should be able to:

- Define and understand allergy and atopy
- Appreciate the different types of allergen, both seasonal and perennial
- Explain the diagnostic skills used in identifying allergic disease
- Discuss when and how allergens can be avoided
- Illustrate the different types of treatment available.

INTRODUCTION
Allergy is very important to anyone suffering from allergic disorders and may involve several parts of the body, but this is not reflected in the health service where clinical specialists tend to be trained in system-based specialties, such as cardiology, ENT, gastroenterology and dermatology. Nurses are ideally suited, with the appropriate training and experience, to bridge this gap between specialties and take an holistic look at the patient's problems (Hide 1987).

THE IMMUNE SYSTEM
The immune system is the body's defence mechanism against disease (Morrow-Brown 1985). Generally, specific antibodies, or immunoglobulins, are produced to counteract specific invading antigens, such as bacteria or foreign protein. A memory bank is built up to recognise invaders and react quickly. This is the principle behind childhood immunisations.

There are many immunoglobulins (Ig), each with different functions:

- IgG contains ready-made antibodies and can cross the placental barrier, giving the foetus passive immunity at birth
- IgA is found in abundance in colostrum, tears, nasal and bronchial secretions, saliva and gut secretions, and is vital in new babies to seal the gut to prevent the entry of antigens
- IgE is basically to help reject parasite infestation.

BASIS OF ALLERGIC DISEASE
At times, the body overreacts to antigens causing various allergic or hyperresponsive reactions (types 1-4). The commonest forms of allergic diseases are:

- Asthma
- Rhinitis
- Eczema.

These are IgE mediated, whereby sensitive individuals recognise harmless proteins, usually enzymes or reproductive protein, as though they were parasite antigens and then respond to them with IgE synthesis. The antigens are then called allergens. Following a second exposure to these proteins, in which the body falsely perceives that a parasite is attempting entry, the sensitised individual's immune system responds in a totally inappropriate fashion (Buck et al 1997).

To reject the invading parasite, the tissue responds with increased blood flow to recruit inflammatory leucocytes, increased mucus production and the sacrifice of epithelial cells. The symptoms caused will depend on the organ that has been sensitised, with the reaction in the bronchi manifesting as asthma, triggering the release of mediators from mast cells and eosinophils, and cytokines from T-lymphocytes causing plasma leakage and bronchospasm (Buck et al 1997).

In the nose and eyes, the plasma leakage will cause swelling, irritation and rhinorrhoea, collectively known as rhinitis.

The tendency to overreact with an IgE mediated response, called atopy, is inherited, with the gene recently isolated. Children born to a couple with a strong family history of atopy have a 30-60 per cent chance of developing an allergic disorder (Buck et al 1997).

Work being carried out at Southampton has found that sensitisation can begin in utero as early as 22 weeks gestation, and that, once the foetus is sensitised, it produces much more IgE than normal and may go on to develop any of the allergic diseases (Warner et al 1997).
ALLERGIC DISEASES

Atopic eczema
This usually presents from 12 weeks of age with approximately 10 per cent of children affected by four years (Buck et al 1997). Severe cases may continue into adulthood and many go on to develop inhalant allergies. Atopic eczema is the most proliferative type and treatment can include:
- Skin preparations – emollients and steroid creams
- Allergen avoidance – diet and washing
- Support – National Eczema Society.

Non IgE mediated seborrhoeic eczema affects the scalp, face and chest, while contact eczema can be caused by irritants (washing up liquid, engine oils, jewellery). Eczema can often be infected and, therefore, require treatment using antibiotics as well as skin preparations, to avoid the onset of septicaemia – particularly if herpes simplex is involved (Launer 1989).

Asthma
Ninety per cent of children with asthma are atopic, in comparison to 50 per cent of adults (Pepys 1973). Allergy testing and avoidance is therefore suggested, to help remove trigger factors (BTS et al 1997) and allergies that cause occupational asthma and require specialist referral.

Seasonal rhinitis
With symptoms of nasal obstruction, rhinorrhoea, sneezing and conjunctivitis, this is more generally referred to as ‘hay fever’. Seasonal rhinitis may be caused by grass pollen in the summer, but may also trouble people in the spring when tree pollens are the cause, or in the autumn from moulds.

Perennial rhinitis
This is similar to seasonal rhinitis but persists all the year round, with the house dust mite droppings, house dust or animal dander causing winter symptoms. A one-sided or perpetual nasal blockage may suggest a non-allergic cause.

Food allergy
True food allergy, which is IgE mediated, is normally obvious by the strong reaction it causes of tingling in the mouth, angio-oedema, urticaria and possibly anaphylactic shock. Once sensitised, even tiny amounts of shell-fish, fish and nuts, eggs and milk, can trigger an acute attack. Milder reactions, which are not IgE mediated may be triggered by foods such as:
- Wheat
- Citrus fruit
- Wine (especially red)
- Yeasts
- Potato skins
- Tomatoes
- Sodium metabisulphite (a preservative).

Detection is by excluding the food from the diet but this should be undertaken with the guidance of a nutritionalist. On occasions, the food can be tolerated when cooked, such as eggs in a cake, but not alone such as a boiled egg; childhood vaccines grown on egg should be avoided.

Of those who are allergic to nuts, 82 per cent are allergic to peanuts. Nut allergy is also becoming more common in children under two, especially if atopic (Ewan 1996). The reaction is unlikely on the first ingestion or injection of the allergen, but on second and subsequent ones.

Latex allergy
This is increasing in and may have a cross-association with:
- Avocado pear
- Banana
- Kiwi
- Chestnut.

It can also affect those using gloves (as in nursing), dummies or condoms.

Anaphylaxis
Anaphylaxis is the term used when more than one system is involved; this may be caused by any allergen if the patient is highly sensitive or if there is sufficient provocation. Anaphylactic shock is caused by a massive leakage of plasma and cells into the tissues, resulting in a catastrophic drop in blood pressure and circulation. Drugs, particularly penicillin, may cause this, as may multiple or repeated wasp and bee stings (Buck et al 1997).

DETECTING ALLERGIES

Detection of allergies includes:
- History taking
- Allergen testing.

History taking
This needs to be thorough and detailed (Table 1) and may take 10-30 minutes, depending on the complexity of the symptoms. Anyone needing routine medication to relieve symptoms deserves to be thoroughly investigated, as one type of allergy may exacerbate another. For example, by treating their rhinitis, patients with asthma may improve (Scadding 1997).

Allergen testing
Skin prick tests should be carried out in your locality? If you are not sure, it is advisable to make enquiries.
Table 1. History sheet for detecting allergies

- Patient's name, age, sex, address
- Place and nature of work
- Present symptoms
- Past symptoms – possibly eczema, asthma, hay fever, food intolerance/reaction, migraine, urticaria, bronchitis
- History of atopy
- Known trigger factors
- Duration of symptoms – onset, type, sensitivity
- Seasonal variations – pollens, moulds, trees, grass
- Occurrence of symptoms – inside/outside, day/night/morning/evening
- House environment – building materials, damp
- Bedroom conditions – bunk bed, carpet-frills, toys
- Animals – in/out, contact with others' animals
- Food allergies or intolerances
- Drug allergies or intolerances
- Fungal infections
- Present drugs taken

possible, house dust and other pollens should be added; along with other furry animals. The patient should not have had any anti-histamine medication for 56 hours (three weeks for astemizole) as this will prevent an accurate reaction. Avoiding oil or body lotion on the arms prevents the liquid allergen from dispersing immediately during the test.

The test involves a tiny drop of each allergen being placed on a marked area of the inside of the forearm then pricked lightly, not drawing blood; a positive and negative test are needed. Occasionally people feel a little 'spaced out' as the allergen circulates in the system and may also show enhanced symptoms of their disease or a vasovagal reaction. Giving a dose of anti-histamine after positive results prevents late-onset reactions and an uncomfortable arm for several hours or days. Adrenaline 1:1000 should be available, although it is rarely needed when aero-allergens are tested. Anything known to have caused anaphylaxis should not be tested with skin-prick tests: as an alternative a radioallergosorbent test (RAST) should be used. Atopic patients usually have positive results to common allergens.

Patch tests are used when attempting to try and isolate allergens or chemicals that cause eczema or contact dermatitis, such as nickel, and involve putting various cream solutions on tiny metal plates (Fig. 1). The plates are removed after 48 hours and skin reactions, which can be very irritating, are read after 72 hours. Advice is then given about avoiding the appropriate allergen.

RASTs count the amount of overall IgE present in the blood which may be high (normal is <81 Ku/L), following which testing for specific IgE can be requested. RAST is used when, in certain cases, the correct allergen may not be available to test, or be too risky to test with skin prick tests, as in a nut allergy or severe eczema. These tests are expensive – about £10 per specific allergen – and take several weeks for the results.

Fig. 1. Patch testing

NOW DO TIME OUT 3

If you already run an asthma/airways clinic, you might have thought about training to do allergy testing. If you would like to find out more, refer to the useful addresses listed.

MANAGEMENT

Primary prevention depends on preventing the susceptible baby from becoming sensitised (Warner et al 1997) by:

- Pre-natally: no maternal or passive smoking; low levels in the home
- Post-natally: breast feeding for four months if possible; covering the mattress; minimal pet contact.

Treatment Treatment will probably include a mixture of topical applications and oral or injected medication.

Antihistamines are excellent for symptoms of rhinitis, including itching and runny nose. If the patient also has a discharge and a blocked nose, the introduction of nasal steroids can be useful. Taking antihistamine for a week before hay fever starts may prevent symptoms developing. Long-acting antihistamines do not normally have the sedative effect found in chlorpheniramine and promethazine, which are useful for children with eczema to aid sleep and in acute allergic reactions. Preventive treatment with cromoglycates can reduce mast cell reactions. Inhaled steroids and
Table 2. Patient advice for pollen and spore avoidance

- Listen to the pollen count from local media
- Keep windows closed in the early morning and evening (pollen falls as air cools)
- Keep car windows closed on journeys
- Wear sunglasses to avoid conjunctivitis (sore eyes)
- Carry relievers and possibly take extra preventer
- Avoid long, fluffy, grass
- Plan cross-country runs carefully if asthma is severe
- Avoid walking in autumn leaves and kicking them around
- Use a DIY mask for dusty jobs
- Watch cut flowers in the house
- Check that there is no mould on house plant soil

bronchodiilators continue to be the drugs of choice for asthma (BTS 1997). Antileukotrienes may be effective in both rhinitis and asthma. Adrenaline is available to carry around as an inhaler, as Anapen adrenaline auto-jet (adult only use) or EpiPen 0.3mg IV or IM. Hydrocortisone succinate and chlorpheniramine will be needed soon afterwards. Hyposensitisation is commonly given in this country for wasp and bee hypersensitivity and severe hay fever, when they are otherwise not controllable on antihistamines and steroids. This is not suitable for people who have asthma.

ALLERGEN AVOIDANCE

Most people who are atopic find themselves allergic to several allergens which cannot all be avoided, so preventive medicine will probably need to be taken regularly. Depending on the severity of the asthma, rhinitis or eczema, some measures can be taken to reduce the symptoms and the amount of medicines needed. Colloff et al (1992) collated numerous studies showing that reduction in house-dust mite exposure in sensitive individuals reduces allergic symptoms.

It is sensible to check allergies are present with skin prick tests before embarking on the measures that follow.

House dust mite House dust mites are minute arachnoids, feeding off fallen skin scales, and like conditions that are dark, warm (25-30°C) and humid (75-80 per cent humidity). They can colonise a mattress in just three months and are present in every home, mostly in the mattress, and are not a sign of being dirty. The allergen (Der p1) is found in the droppings.

The bedroom Surfaces should be kept clear, and damp-dusted weekly. Frills should be avoided and piles of books and toys should be put in a cupboard or box. Carpets should be thin-piled; wooden flooring or lino should be wiped frequently. Bed covers should be easily washable; water heating to 60°C is necessary to kill the mite. Sheepskin underblankets should be avoided. Pillows should be washed regularly and water vapour permeable covers should be used if the pillows are filled with feathers. House dust mite levels in feather pillows are no higher than in polyester pillows, but they are less easily washed.

Mattress covers, if water vapour permeable, reduce symptoms by not allowing fine particles through, while also allowing the mattress to breathe. They should totally enclose the mattress and have a zip fastening. By June 1998, all covers claiming allergy protection should have a European CE mark (Which? 1994). Bottom bunk beds should always be avoided, unless the top mattress is covered, as should spray polishes. Cuddly toys should be kept to a minimum and washed regularly to remove the allergen. Putting them in the freezer regularly will act to kill the mite.

Vacuum cleaners These should be fitted with high filtration filters to remove particles >2 microns and may help to reduce mite levels escaping into the air, although no clinical effect is, as yet, proven. Care is needed when emptying bags or containers (Which? 1997).

Ionisers and acaricides The use of these has not yet been independently proven (BTS 1997).

Pets If possible, furry pets should be avoided when children are under one year (Warner et al 1997). Removal of pets will reduce the allergen levels but there will be some remains in carpets and furniture, even if the animal is no longer around. If furry pets are kept, additional medication may be necessary and animals should never be allowed in the bedroom, particularly on the beds. Hamsters, gerbils, mice, rats and budgies, often housed inside, can encourage persistent asthma, and should be definitely be kept out of the bedroom.

Cat allergen (Fel d1) is found in saliva and is licked over the fur. Wiping or washing the cat weekly may help. Animal bed linen needs to be washed frequently at 60°C. Taking the animals in the car should also be avoided, especially on school runs and long journeys. If horse riding, clothes should be changed as soon as possible.

Pollens and spores Pollens are male plant seed, blown by the wind, which have different seasons:
- Trees – January to May
- Grass – May to July
- Weeds and flowers – June to October
- Mould spores – July to November.

NOW DO TIME OUT 4
Reproduce the information in Table 2 as a handout for patients.
ANAPHYLAXIS AVOIDANCE

Food  Suspected foods should be isolated and avoided. Patients should be advised to read the label on packets. When eating out, people need to be aware that even cooking utensils and oils can be contaminated. Atopic babies should not be given nuts or peanut products to avoid becoming sensitised (Tariq et al 1996).

Wasps and bees  Bright coloured clothes, especially red and orange, should be avoided as they might attract insects. Patients should be advised not to kill wasps or to keep bees.

Carrying an Epipen or Anapen that contains adrenaline can be life-saving. Patients can learn to use it by practising with a dummy pen. It might be advisable for patients to wear a a Medic-alert bracelet and to join the Anaphylaxis Campaign (see Useful Addresses).

CONCLUSION

After specialist training, nurses can play a significant role in helping to provide allergy facilities in primary and secondary care, and help develop clinical allergy for the benefit of patients.

NOW DO TIME OUT 5

Write to the useful addresses listed and find out any resources that are available for patients.

USEFUL ADDRESSES

- The Anaphylactic Campaign, PO Box 149, Fleet, Hants GU13 9XU. Tel: 01252 542029.
- The British Allergy Foundation, Deepdene House, 30 Bellegrove Road, Welling, Kent DA16 3PY. Please send £10 for information pack and quarterly magazine.
- National Asthma Campaign, Providence House, Providence Place, London N1 0NT.
- National Eczema Society, 163 Eversholt Street, London NW1 1BU.

For allergy training contact:

The National Asthma and Respiratory Training Centre, The Athenaeum, 10 Church Street, Warwick CV34 4AB.
Tel: 01926 493313.
Assessment

This assessment relates to Article 441: Brewin A (1998)
Allergy avoidance. Nursing Standard. 12, 32, 49-56.

TO COMPLETE THE ASSESSMENT:

- Follow the instructions on the answer sheet found in your copy of the journal.
- Mark the title of the article as Allergy avoidance. The number is 441.
- You should only answer a question when you are confident that you can do so correctly.
- If you should wish to change your selection, use a soft eraser to remove or lighten the mark that you do not want to appear and ensure that the answer(s) that you have finally selected show up boldly.
- Fold the answer sheet only where indicated.
- Send it with your free assessment voucher or £10 fee (£15 for non-RCN members) to: RCN CE Articles, Royal College of Nursing, Freepost, Cardiff CF5 1ZZ, by April 29, 1999 (cheques payable to RCN).
- If successful, you will be informed in writing. Five CEPs are awarded for successful completion of this CE article assessment. You are entitled to one retake if you are unsuccessful.

FURTHER ANSWER SHEETS CAN BE OBTAINED BY CALLING 0181 423 1066

PROFILE ONE

James, aged seven, has asthma and is referred with worsening symptoms. A history shows that he had eczema as a baby, was fed on soya milk because of a milk allergy, and has a brother with hay fever. His father and grandmother are both 'bronchial'.

From this history you would expect James to be:

a) Diabetic
b) Paraplegic
c) Atopic
d) Epileptic
e) Non-atopic

The symptoms in James' family are likely to be:

a) Caused by pollution
b) Due to the diet they eat
c) Due to where they live
d) IgE mediated
e) IgA mediated

James' asthma worsened last year. The most likely cause was due to:

a) Exam pressure
b) Riding his bike to school
c) His friend's house being decorated
d) Helping in the garden
e) The cat they adopted last year

James' history suggests he is likely to have:

a) An anaphylactic reaction to penicillin
b) Positive skin prick tests to house dust mite and cats
c) Allergies to wheat, fish and eggs
d) A parasite infection
e) Positive patch tests

James' and his brother always get 'colds' in the spring. This could be due to:

a) Cold weather and viral infections
b) Tree pollen allergy
c) First cut of the grass
d) Mould allergy
e) The cat

The best test to check atopy to house dust mite and cats is:

a) RAST
b) Patch tests
c) Blood count for eosinophils
d) Histamine challenge tests
e) Skin prick tests

James is found to be strongly allergic to house dust mite. He will need:

a) To vacuum his bedroom daily
b) To have an ioniser
c) A plastic mattress cover
d) A special mattress cover and pillow case cover
e) To go to a special school

James' asthma is likely to be treated routinely with:

a) Bronchodilators
b) Bronchodilators and inhaled steroids
c) Antihistamine tablets daily
d) Antihistamine nasal sprays
e) Nasal decongestants

Which of the following is most likely to reduce James' symptoms:

a) His rhinitis is improved with nasal steroids
b) His tonsils are removed
c) He takes oral steroids daily
d) He takes vitamins daily
e) He has a nebuliser

PROFILE TWO

Mr Ping Cheng, aged 35, was found on the ground in his garden, clutching his salbutamol inhaler and semi-conscious. He keeps bees. He takes no other medication.

The symptoms in James' family are likely to be:

a) Caused by pollution
b) Due to the diet they eat
c) Due to where they live
d) IgE mediated
e) IgA mediated

The best test to check atopy to house dust mite and cats is:

a) RAST
b) Patch tests
c) Blood count for eosinophils
d) Histamine challenge tests
e) Skin prick tests

The most important part of the diagnosis of allergy is:

a) Taking a detailed allergy history
b) Finding out about his wife's allergies
c) What drugs he is taking
d) Challenge tests
e) Skin prick tests
### SCHEDULE

Plan your Continuing Education programme with Nursing Standard

<table>
<thead>
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<td>May 20</td>
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<td>May 27</td>
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13 As he keeps bees, he has been stung several times, despite wearing protective clothing, but has never reacted before. If he is stung again, the reaction is likely to:

   a) Gradually become less violent
   b) Possibly become life-threatening
   c) Be worse if he is stung by wasps
   d) Be reduced by taking Piriton daily
   e) Cause eczema

14 The first drug of choice in an anaphylactic reaction is:

   a) Intravenous hydrocortisone
   b) An oral antihistamine
   c) Intravenous antihistamine
   d) Adrenaline via an Epipen or Anapen
   e) A bronchodilator inhaler

15 What is the best way to find out if Mr Cheng is allergic to bee stings?

   a) RAST from a blood test
   b) Skin prick tests to wasp and bee stings
   c) Patch tests
   d) Direct challenge test with bee sting
   e) Spirometry

16 If adrenaline is to be given, it is best administered:

   a) By the GP in the surgery
   b) By a friend using the mini-jet syringe
   c) By the patient immediately
   d) In Accident and Emergency under medical supervision
   e) By the ambulance crew on arrival at the scene

17 The best advice for Mr Cheng is to:

   a) Have desensitisation injections for three years
   b) Give up the bees
   c) Use more smoke to make them sleepy before touching them
   d) Wear more protective clothing
   e) Be protected by daily chlorpheniramine

18 Mr Cheng could be vulnerable if bees are around. Should he:

   a) Never go outside in the summer time
   b) Carry adrenaline and chlorpheniramine, and wear a Medic-alert bracelet
   c) Always wear long-sleeved shirts and trousers
   d) Carry information in his pocket in case of emergency
   e) Leave his wife to look after his medication

19 Anaphylaxis is:

   a) A severe allergic reaction to a drug, sting or food
   b) A vasovagal attack causing faintness
   c) Psychological
   d) More likely in adults than toddlers
   e) Caused by skin prick tests

20 What food allergy is becoming more common in children under two?

   a) Apples
   b) Peanuts
   c) Oranges
   d) Milk
   e) Wheat