

Anaphylaxis: How to respond with confidence

Anaphylaxis is a severe and immediate hypersensitivity reaction usually to food, drugs or insect stings. As Avery and Pringle (1995) have stated, life-threatening emergencies are not an everyday occurrence in general practice, and some conditions such as anaphylactic shock may occur only a few times in a professional lifetime. The rarity of emergencies makes the task of keeping up to date with best practice a challenge. Avery and Pringle suggest that regular discussion of up-to-date protocols, regular attendance at practical courses and the stocking and maintenance of appropriate equipment will all help ensure that general practice professionals can deliver a high quality emergency service.

In the experience of Jane Lambert, who runs a company providing training to GPs and practice nurses, resuscitation training is the most commonly requested. Rarely do GPs request anaphylaxis training. It is also not routine for practice nurses in all areas to attend such training.

Over recent years, the trend has been to update community-based nurses annually on the recognition and management of anaphylaxis, but there appears to be a lack of such training among practice staff.

Hogan (2002) suggests that the increased prevalence of allergy in the community makes it likely that at some stage most GPs will have to treat a case of acute anaphylaxis.

Ewan (1998) found that little data on the overall incidence of anaphylaxis was available. He found a study of cases presenting to the accident and emergency department in Cambridge, which highlighted that 1 in 1500 patients attending the department had anaphylaxis with loss of consciousness or collapse (equivalent to 1 in 10 000 a year in the population). They then found that the rate almost trebled when systemic allergic reactions with respiratory difficulty were included.

Ewan (1998) suggested that foods are the commonest cause of anaphylaxis. Insect venom is the next most common cause. A rapidly increasing problem is allergy to latex rubber. He suggested that vaccines remain a rare cause of anaphylaxis, but drugs causing anaphylaxis include antibiotics, intravenous anaesthetic drugs, aspirin, non-steroidal anti-inflammatory drugs, intravenous contrast media and opioid analgesics.

The following discussion explains how to recognize anaphylaxis and manage an emergency. The need for staff to prepare themselves in advance of such events as highlighted.

Recognition

The Resuscitation Council (UK) (2005) suggests that there are no universally accepted definitions of anaphylactic and anaphylactoid reactions. The term anaphylaxis is commonly used for hypersensitivity reactions typically mediated by immunoglobulin E (IgE). Anaphylactoid reactions are similar, but do not depend on hypersensitivity. Initial treatment will be the same. The clinical features of anaphylaxis are listed in *Table 1*.

The Resuscitation Council (UK) (2005) also states that reactions vary in severity, and that progress may be rapid, slow, or (in unusual cases) biphasic. In rare instances manifestations may be delayed by a few hours, or may persist for more than 24 hours.

The lack of any consistent presentation of anaphylaxis sometimes makes diagnosis difficult. The Resuscitation Council (UK) (2005) finds that many patients with genuine anaphylaxis do not receive appropriate medication. It also suggests that in rare cases patients have been given injections of adrenaline inappropriately for vasovagal reactions or panic attacks.

The Resuscitation Council (UK) continues to urge that, in each case, a full history and examination should be undertaken as soon

Table 1. Signs and symptoms of anaphylaxis

Angio-oedema
Urticaria
Dyspnoea
Hypotension
Rhinitis and conjunctivitis
Abdominal pain, vomiting and diarrhoea
Sense of impending doom
Skin may appear either flushed or pale
Cardiovascular collapse

From: Resuscitation Council (UK), 2005.

Jane Lambert explains how to respond to a patient suffering an anaphylactic reaction

Jane Lambert is Independent Resuscitation Officer and Director of ECG Ltd, and **Emma Adams** is Practice Nurse, Watling Vale Medical Centre, Milton Keynes Primary Care Trust

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Table 2. Differential diagnoses of anaphylaxis

Differential diagnosis	Distinguishing features
Cardiac arrhythmias	Slow, rapid or irregular pulse Possible chest pain
Myocardial Infarction	Chest pain
Asthma	History of asthma Possible recent chest infection Possible cough
Aspiration of gastric contents	History of events Cough Possible audible crackles
Seizure	Seizure may be witnessed
Unstable diabetes	Known diabetic, probably aware of his/her normal symptoms
Pulmonary embolism	Chest pain
Pneumothorax	Sudden pain Possible abnormal chest movement (one sided) May be associated with trauma
Vasovagal attacks	Rapid recovery Slow pulse
Fictitious allergic reaction (symptoms made up by patient)	Known attention-seeking behaviour Absence of any signs

Important: Most of the above differential diagnoses will **not** have the associated urticaria and angio-oedema, and they will **not** be compatible with a history of allergic reaction

From: Sanders, 2005.

as circumstances permit. A history of previous allergic reactions is important as well as a history of emergency incident. Special attention should be paid to the condition of the skin, the pulse rate, the blood pressure, the upper airway, and auscultation of the chest. Peak flow should be measured where possible, and recorded.

Differential diagnosis

It is important to respond quickly to a patient who may be suffering an attack of anaphylaxis, but many nurses may worry about making an accurate diagnosis. Walker (2002) emphasizes that if a patient presents with one or more of the symptoms of anaphylaxis following a sting from a bee or wasp, or after a meal, anaphylaxis is very likely to be the diagnosis, especially if the patient has a history of respiratory allergy. She also points out that intramuscular adrenaline has very few contraindications.

There are many differential diagnoses of anaphylaxis. Sreevastava and Tarneja (2003) suggest that a vasovagal reaction is the one most commonly confused with anaphylaxis, but the lack of pruritus in the presence of a slow pulse rate and normal blood pressure

distinguishes a vasovagal attack from anaphylaxis. Other possible differential diagnoses are listed in Table 2.

Management

The Resuscitation Council (UK) has devised a simple algorithm to help staff in the management of anaphylaxis (Figure 1). A diagnosis of anaphylaxis should be considered when the person has a compatible history of severe allergic-type reactions with respiratory difficulty and/or hypotension, especially if skin changes are present. An ambulance should be called and notified of a suspected diagnosis of anaphylaxis.

The appropriate dose of adrenaline (epinephrine), depending on the person’s age, should be administered intramuscularly (Table 3). The preferred site of injection is the

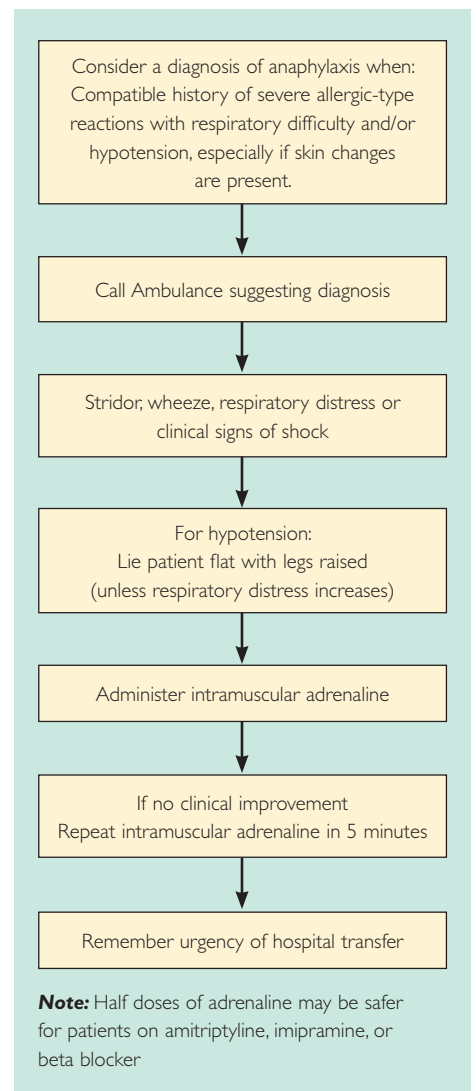


Figure 1. Treatment algorithm for adults in the community (Resuscitation Council (UK), 2005).

midpoint of the thigh, anterolateral aspect. If no clinical improvement is observed within 5 minutes, the adrenaline dose should be repeated.

The Resuscitation Council (UK) (2005) states that adrenaline is generally regarded as the most important drug for any severe anaphylactic reaction. It reverses peripheral vasodilatation, reduces oedema, dilates the airways, increases the force of myocardial contraction, and suppresses histamine and leukotriene release. It is best given early. The Council also finds that adverse effects are extremely rare with appropriate doses of intramuscularly administered adrenaline.

The Resuscitation Council (UK) (2005) has provided separate guidelines for community nurses and first medical responders. The main difference between the guidelines is the assumption that most community nurses will only have access to adrenaline to administer. Practice nurses work alongside GPs and have access to other drugs. Therefore all aspects of care should be considered if a GP is present.

The minimal standard must be the administration of adrenaline, while awaiting the arrival of an ambulance. Practice nurses will also have access to oxygen, which should be administered at a high flow rate (10–15 litres per minute) (Figure 2).

If practices are stocked with chlorphenamine and hydrocortisone, these should also be considered. GPs should be aware of recommended doses and appropriate cautions with administering these. If severe hypotension does not respond to drug treatment, fluid should be infused following recommended volumes. These can all be covered in relevant training sessions.

Anaphylaxis training

In the authors' experience, most nurses are generally confident in discussing the signs and symptoms of anaphylaxis, but less confident about making the final diagnosis and decision to administer adrenaline.

Both GPs and practice nurses should receive regular training in the recognition and appropriate management of anaphylaxis. Equipment and drugs available within the practices may be checked during training sessions to ensure that staff are familiar with them. Scenarios are often used to increase staff confidence in the management of such an event.

Dyer (2003) found that only 10% of GPs had had clinical allergy training. He also found that hospital admissions for anaphy-

Table 3. Intramuscular adrenaline doses

Age	Dose
Adults	0.5 ml 1:1000 solution (500 µg)
Child >12 years	0.5mL 1:1000 solution (500 µg)
Small or prepubertal child	250 µg
6–12 years	250 µg (0.25 ml 1:1000 solution)
6 months to 6 years	120 µg (0.12 ml 1:1000 solution)
< 6 months	50 µg (0.05 ml 1:1000 solution) Absolute accuracy is not essential



Figure 2. Patient receiving oxygen and adrenaline for anaphylaxis.

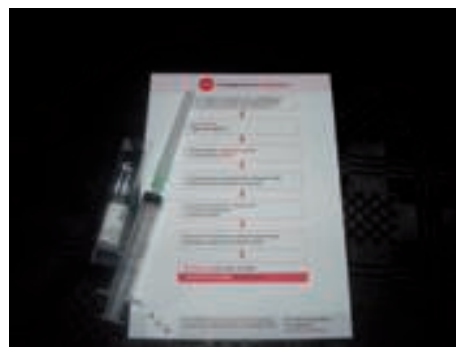


Figure 3. Pocket algorithm for adrenaline.

laxis have increased sevenfold over the last decade, and that allergic disease accounts for 6% of general practice consultations.

Hogan (2002) discussed how imperative it

Table 4. Audit of knowledge about treating anaphylaxis among practice nurses and GPs

Question	Correct answer	Correct responses	
		Practice nurses	GPs
Please list the signs and symptoms of anaphylaxis	5 out of 9 signs and symptoms (Resuscitation Council UK, 2005)	5 (83%)	6 (100%)
What is the most important drug that should be given to treat anaphylaxis?	Adrenaline	6 (100%)	5 (83%)
What would you do if the patient didn't respond to the first dose of adrenaline?	Repeat the dose	6 (100%)	2 (33%)
Should the patient always go to accident and emergency after anaphylaxis?	Yes	6 (100%)	2 (33%)

is that GPs are prepared for an anaphylactic event because failure to recognize a reaction or to follow a validated protocol can have fatal consequences.

It would be difficult for anyone to remember all of the recommended doses of adrenaline. Pocket-sized algorithm cards have been devised for all staff trained. Nurses keep these in their pockets or next to the adrenaline (Figure 3).

Auto-injectable adrenaline

Hayman et al (2003) investigated how knowledgeable patients and GPs were in the use of auto-injectable adrenaline (Figure 4). They found that patients and GPs lacked knowledge of how and when to use these devices, even though GPs prescribe them. They also found that some practice nurses provided the training for patients. More concerning, was the large proportion of GPs who would not advise patients who had injected adrenaline to go to hospital, a contradiction of recommended practice (Resuscitation Council (UK), 2005).

Figure 4. The Anapen adrenaline auto-injection device.



Prevention is the most important part of anaphylaxis management. In patients with known allergies, self-administration of adrenaline plays a key role in reducing mortality.

Many community nurses now carry pre-filled syringes of adrenaline for anaphylaxis. (Figure 5). Although these are more costly, they provide safer and faster administration during an emergency. Some practices keep these, or even purchase an auto-injectable syringe for their own use. Devices such as EpiPen and Anapens contain 300 µg for an adult, and 150 µg for children. These devices can remove the worry of having to know the drug dose and increase the speed of administration.

Audit of practitioners' knowledge

A small audit of staff at the Watling Vale Medical Centre in Milton Keynes was carried out in December 2005 to assess the level of knowledge about anaphylaxis held by GPs and practice nurses. The practice nurses and GPs were asked to complete a questionnaire on anaphylaxis. Forms were returned by six nurses and six GPs.

All of the nurses had received training on anaphylaxis within the previous 14 months. None of the GPs had attended anaphylaxis training within this time, and a few had never attended training on the subject.

Results

Most staff, with or without training, were able to identify at least five of the nine signs and symptoms of anaphylaxis defined by the Resuscitation Council (UK) (2005). Most were aware of the importance of adrenaline. But only a third of the GPs were aware that the adrenaline dose should be repeated if there is no improvement in the patient and only a third stated that the patient should

Figure 5. The Minijet adrenaline auto-injection device.



always be referred to accident and emergency (Table 4).

Participants were also asked about the dose of adrenaline that is recommended. Two respondents were accurate with the dose, everyone else knew where the information was available in an emergency.

Half of those asked said that at some point in their careers they had dealt with a patient with anaphylaxis, although no one had in the last few years at the practice.

Only a third of respondents ($n=4$) thought about giving oxygen when questioned.

Discussion

It is not uncommon that none of the GPs had received recent training in anaphylaxis; this is the case in many practices. It was worrying that few GPs appeared to know that adrenaline should be repeated if required, and few identified the need to always transfer patients to hospital.

The practice nurses had received regular and recent training, and were able to discuss the appropriate care and transfer, following recommended guidelines.

GPs at this medical centre responded positively to this audit, and are now arranging training for the treatment of medical emergencies, including anaphylaxis.

Conclusions

Anaphylaxis continues to be a rare emergency occurrence in general practice. However, this life-threatening reaction requires urgent treatment. In the absence of appropriate intervention, it can prove to be fatal.

Most nursing and medical staff surveyed in this audit were able to give an accurate

description of the likely clinical presentation of anaphylaxis. However, regular training in recommended protocols for treatment should be essential for all of these health professionals. Practices should have annual resuscitation and anaphylaxis training. Scenarios run by the instructor should be encouraged.

Practices should also review their adrenaline stock, in terms of how they would prefer to have it available. Many areas still stock the glass ampoules. Some thought should be given into the possibility of obtaining pre-filled syringes for use in this emergency situation.

It is also essential that a clear protocol, including adrenaline doses, must be available with the adrenaline, because few people will remember these recommended doses.

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KEY POINTS

- Anaphylactic reactions vary in severity, and progress may be rapid, slow, or (unusually) biphasic
- Special attention should be paid to the condition of the skin, the pulse rate, the blood pressure, and the upper airway
- Adrenaline (epinephrine) reverses peripheral vasodilatation, reduces oedema and dilates the airways
- Hospital admissions for anaphylaxis have increased sevenfold over the last decade
- Allergic disease accounts for 6% of general practice consultations
- It is essential that a clear protocol, including adrenaline doses, must be available

Conflict of interest:

Jane Lambert is Director of ECG Ltd, a private training company.