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Anaphylaxis: recognition and management in children and young people

Abstract - Anaphylaxis can be defined as a severe, life-threatening and generalised allergic reaction (Grabhenrich et al., 2016). There are a vast number of triggers which can cause anaphylaxis although those most commonly identified include food, drugs and venom. The Resuscitation Council (2012) reported that the UK incidence of anaphylaxis is rising particularly in children and young people. Experiencing anaphylaxis is frightening and anxiety provoking for both the client and their family. It is vital that nurses are able to not only recognise and respond to the condition but also provide significant emotional support.

Key words: anaphylaxis, allergy, trigger, management

Anaphylaxis can be defined as a severe, generalised and multi organ reaction (Grabhenrich et al., 2016; Anagnostou & Turner, 2019). It is at the extreme end of the allergic spectrum and significant symptoms include; rapidly developing life-threatening airway, breathing and/or circulation problems (Grabhenrich et al., 2016; Anaphylaxis Campaign, 2019). Frequently these symptoms are connected with skin and mucosal changes (See Box 1 for other common symptoms). The presentation of signs and symptoms can vary greatly between individuals. There are a vast number of triggers which can cause anaphylaxis although those most commonly identified in Europe include; food, drugs and venom (Grabhenrich et al., 2016). Food is a particularly common trigger for children and young people (National Institute of Clinical Excellence [NICE], 2011).

The incidence of anaphylaxis globally varies greatly (Wang et al., 2019). However between 3.5 and 8 % of children are thought to have food allergies (Foong, Du Toit and Fox, 2017). A study found that in England and Wales between 1992 and 2012 there was a 615% increase in hospital admissions due to anaphylaxis (Turner et al., 2015). Although deaths due to anaphylaxis were not found to have increased, it is estimated that in the whole population there are around 20 allergy related deaths per year in the UK (Resuscitation Council, 2012). It is thought that the increase in admissions may be due to increasing public awareness, shifting patterns in public behaviours and changing responses by health care providers (Turner et al., 2015)

Commonly recognised triggers include:

- Drugs, e.g. anaesthetics and contrast media used in Xrays
- Food, e.g. peanuts, shellfish and eggs
- Bee and wasp stings
- Blood products, such as platelets
- Immunisations
- Latex
- Approximately 20% of anaphylactic reactions the cause remains unknown, described as idiopathic (Anagnostou & Turner, 2019).

The significant symptoms are caused by the body's physiological response to a perceived threat, known as a trigger or an allergen. The body releases numerous compounds in response to the trigger, including histamine, which in turn produces an effect. Some examples of the physiological effects include; capillary leakage which causes the recognisable urticarial rash (see Figure 1 – include picture of urticaria) and hypotension. Mucosal oedema, which is the build-up of fluid in the layer of tissue that lines the body's interior, leads to swelling around the airways. Smooth muscle contraction can cause asthma like symptoms and abdominal pain (Jevon, 2008). Severe clinical risks include asphyxia, respiratory arrest and circulatory collapse.

Box 1

Common symptoms include:

- Urticaria - rash with itching, redness and raised white areas of swelling
- Swelling of subcutaneous tissues
- Respiratory distress
- Wheeze
- Stridor
- Cough
- Profound hypotension
- Tachycardia
- Pallor
- Unresponsiveness

Anaphylaxis can vary in severity of outcome and symptoms, however the onset is usually rapid (between 1 minute and 3 hours post exposure to trigger). The lack of a consistent presentation can lead to challenges for accurate diagnosis (Jevon, 2008). Differential diagnoses include a panic attack, vasovagal faint or commonly in children an asthma attack. A detailed history and assessment following the 'ABCDE approach' and observing for the symptoms above is recommended by the Resuscitation Council (2019).

Management

Management will vary depending on the setting, location and staffing or resources available. No matter the setting a nurse should call for additional help in the form of an ambulance or doctor early. As with any clinical emergency a practitioner should treat the greatest threat to life first, using the ABCDE approach (See Box 2 How to approach management).

Adrenaline, in some countries known as epinephrine, is the most important intervention in treating anaphylaxis (Anagnostou & Turner, 2019). This is given as an intramuscular injection (often in auto injector form) and should be administered as

soon as any symptoms of anaphylaxis are present. If in a community setting an ambulance must be called immediately following an injection of adrenaline, even if there is an improvement in the presenting symptoms. Adrenaline acts quickly to open up the airways, reduces swelling and raises the blood pressure. It has both α -sympathomimetic and β -sympathomimetic actions resulting in peripheral vasoconstriction, increased cardiac output and bronchodilation (Anagnostou & Turner, 2019). Studies have shown that it is the only drug that inhibits the further release of inflammatory mediators from mast cells and basophils (Anagnostou & Turner, 2019). It is difficult to prove categorically that adrenaline saves lives and studying severe reactions in research is difficult because of the speed with which anaphylaxis can occur (Sheikh et al, 2011). Nevertheless, prescribing and administering adrenaline efficiently is a key component in national guidance and policy (NICE, 2014).

Box 2

How to manage anaphylaxis once recognised (Resuscitation Council, 2012)

- Call for help
- Stop or remove the trigger where possible
- Remain calm, communicating with client and family members your actions
- Administer prescribed adrenaline (ensure the dose is appropriate for age)

When skills and equipment available:

- Establish airway
- Administer high flow oxygen
- Monitor vital signs regularly reporting any changes
- IV fluid challenge where indicated
- Administer prescribed chlorphenamine where appropriate
- Administer prescribed hydrocortisone where appropriate
- Depending on symptoms inhaled Salbutamol
- When client is stable ensure clear and accurate documentation

In around 1 in 20 cases, a second 'wave' of symptoms can develop. This is referred to as a biphasic reaction. Around half of biphasic reactions occur within 6-12 hours of the initial reaction (Lee et al, 2015). Therefore, the length of observation in hospital should be determined by the treating doctor. Sometimes monitoring for 8-24 hours will be required. A lengthy observation period is particularly necessary when the reaction is severe, is of slow onset or idiopathic or could be triggered if further absorption of the allergen is possible (Jevon, 2008). Severe asthmatics also tend to remain under observation in hospital for a longer period (Jevon, 2008). Children with asthma tend to be at greater risk because their existing condition means their airways are already prone to inflammation (Jevon, 2008). Both asthma and allergy are categorised as atopic diseases. Research has shown that having one atopic disease can predispose to having another.

A nurse must recognise the need to manage anaphylaxis after the emergency event has been treated. This should include a referral to a specialist allergy or immunology team (RCPCH, 2011). A specialist team will usually see clients who have

experienced anaphylaxis after the event in order to ensure accurate diagnosis, identify the cause, establish a prognosis and help to prevent further episodes (Webb and Lieberman, 2006).

It is recommended that there is a management plan created so that not only family members but also any care setting or school staff are aware of recognition and management of the condition (RCPCH, 2011). The British Society for Allergy and Clinical Immunology (BSACI) have created standardised care plan templates which are free to download (BSACI, 2018). Written in conjunction with RCPCH and other charitable organisations these robust care plans support the child or young person and all those who care for them to understand the steps required to recognise and respond to symptoms (Anagnostou & Turner, 2019).

Children and young people prescribed an adrenaline auto injector will require this to be with them at all times, including in school. This will require school staff being trained to use the devices (RCPCH, 2011). In 2017 the Department of Health released guidance for schools in England regarding purchasing adrenaline auto-injector (AAI) devices without a prescription. These auto injectors are for emergency use on children who are at risk of anaphylaxis but whose own device is not available or not working (Department of Health, 2017). This is supported by a national campaign called sparepensinschools, including a website to offer guidance for school staff and families (sparepensinschools.com, 2019).

Emotional support

For children, young people and their families the experience of anaphylaxis can be frightening. The journey to identifying a cause and then managing the care in order to prevent further episodes can also be difficult (RCPCH, 2011). Family centred care is a core concept in nursing children and young people and remains essential when considering anaphylaxis (Shields et al., 2012).

Nurses need to plan, implement and evaluate the care in partnership with the whole family (Institute for Patient and Family Centred Care, 2010). This means providing psychological support; exploring the anaphylaxis event, ensuring understanding and providing high quality education to maximise safety. Some specialist teams may have psychology provision to ensure the wellbeing of the client and family. Families should be signposted to local or online support groups to access additional information and input from peers (NICE, 2014), such as the Anaphylaxis Campaign and Allergy UK.

It should be acknowledged that young people may find managing their condition particularly challenging. This is multifactorial and unique to each individual. However, factors include the impact on engagement due to physical, social and emotional changes (Worth et al., 2013). Challenges may arise such as concordance with management plans and ensuring safe transition to adult services (Worth et al., 2013). It is vital to include the young person in all decisions, ensure they are given space to be listened to and identify any increasing risks (United Nations, 1989).

REMEMBER

Anaphylaxis is likely when all of the following 3 criteria are present:

- Sudden onset and rapid progression of symptoms
- Life-threatening Airway and/or Breathing and/or Circulation problems
- Skin and/or mucosal changes (flushing, urticaria, angioedema)

Conclusion

It is likely that all nurses will be exposed to anaphylaxis at some point in their career. Anaphylaxis is a severe, life-threatening and generalised reaction (Resuscitation Council UK, 2012). It is a condition on the rise, particularly in children and young people (Grabenhenrich et al., 2016). This article reviews the recognition, management and emotional support clients and their families will require.

Declaration of interest: none

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