

Risks associated with your anaesthetic

## Section 9: Serious allergy during an anaesthetic (anaphylaxis)

**W**hen you have an anaesthetic you will receive a number of medicines, drugs or injections. During the anaesthetic you may receive injections into a vein or a muscle and anaesthetic gases. Before or after the anaesthetic, you may receive pills, tablets or liquids to swallow, injections or suppositories. You may also be given fluids into a vein to prevent dehydration and you will be in contact with anti-septics and equipment in the operating theatre.

All these things can occasionally cause allergic reactions of varying severity. This article gives information about these reactions.

### What is anaphylaxis?

Anaphylaxis is a severe, life-threatening allergic reaction. Allergic reactions can happen in response to many things – pollen, dust, bee stings, nuts and antibiotics are common causes. These things are called antigens. Rarely, anaphylaxis can happen during an anaesthetic, either caused by one of the anaesthetic drugs or by other substances used during surgery.

We meet thousands of antigens in everyday life and they usually do us no harm whatsoever. Sometimes, for reasons we don't fully understand, the body makes substances called antibodies. The purpose of antibody production is to help eliminate antigens, which may be harmful, from the body. Each antibody is a unique match for its own antigen, and will be produced rapidly if the antigen appears in the body in the future. This is known as sensitization. If they meet the same antigen or a very similar antigen again at a later date, the antibody-antigen combination may cause the release of histamine and other chemicals. These chemical substances released are called mediators and they can cause the symptoms of allergy.<sup>1</sup>

If only small amounts of mediators are released the symptoms are minor – for example, hay fever or skin rashes. If

very large amounts are released very rapidly there may be severe difficulty with breathing (wheezing), low blood pressure or swelling inside the throat, and this is called anaphylaxis. Severe anaphylaxis is life threatening but, with prompt treatment, death from anaphylaxis is very rare.

### Other similar types of reaction

There are some reactions that cause similar symptoms, but are not due to antibody production. It can be more difficult to identify the exact cause of these reactions.

### How is anaphylaxis treated?

- ▶ Any medicine that might have caused the reaction should be stopped immediately.
- ▶ If the pulse is weak, the affected person should be laid flat on their back and their legs should be raised. This is the quickest way to improve the blood pressure.
- ▶ Adrenaline is the most effective drug treatment and is given as a series of injections.
- ▶ In hospitals, oxygen and an intravenous drip are also used.
- ▶ Antihistamines, steroids and asthma treatments might be needed.

Usually the symptoms will settle down quite quickly, but continued observation will be required, often necessitating an overnight stay in hospital. Very serious reactions will require treatment in the Intensive Care Unit (ICU). If the operation has not already started, surgery will almost certainly be postponed unless it is very urgent.

All anaesthetists are trained in how to treat anaphylaxis. Adrenaline is immediately available in every operating theatre.

It is extremely important that any episode of anaphylaxis is investigated in detail, so that the drug or other substance responsible can be identified and avoided in the future. Investigations include blood tests taken at the time of the reaction and then skin testing at a later date.

### How frequently do anaesthetics cause anaphylaxis?

Nobody knows this exactly. At the moment, the best estimate is that a life-threatening allergic reaction (anaphylaxis) happens during 1 in 10,000 to 1 in 20,000 anaesthetics.<sup>2</sup>

Most people make a full recovery from anaphylaxis. We do not know how many anaphylactic reactions during anaesthesia lead to death or permanent disability. One review article suggests that 1 in 20 serious reactions can lead to death, but this is only one person's estimate.<sup>3</sup> This would mean that the chance of dying as a result of an anaphylactic reaction during anaesthesia is between 1 in 200,000 and 1 in 400,000 anaesthetics.

### What can cause anaphylaxis during an anaesthetic?

During any operation and anaesthetic, it is normal to have contact with a wide range of antigens (unfamiliar substances). Many of these could potentially cause an allergic reaction, but some are more likely to do

so than others. Anaphylaxis is more likely when drugs are given intravenously.

The four most common causes of anaphylaxis during anaesthesia are:<sup>4</sup>

- ▶ drugs used to prevent movement during surgery (called muscle relaxants or neuromuscular blocking agents). These drugs are only given to patients who are already anaesthetised.
- ▶ antibiotics – these are often needed during surgery.
- ▶ chlorhexidine, a skin antiseptic often used before surgery.
- ▶ latex (a type of rubber). For many years latex has been used in the manufacture of surgical rubber gloves and other equipment used in operating theatres. Most hospitals are taking steps to reduce the number of latex-containing products they use. The Health and Safety Executive has developed guidelines about the use of latex in operating theatres.<sup>5</sup>

Your anaesthetist will choose drugs for your anaesthetic taking into account many different factors, in particular the type of operation, your physical condition and whether you are allergic to anything. All drugs, including anaesthetic drugs, are carefully tested before they are licensed for general use. In the UK every serious reaction should be reported to the Medicines Control Agency and the Association of Anaesthetists of Great Britain and Ireland National Anaesthetic Anaphylaxis Database. Your anaesthetist should make sure that this is done.

### What factors could make anaphylaxis more likely?

Anaphylactic reactions during anaesthesia seem to occur more in women than in men.

Allergy to certain fruits and nuts, particularly bananas, avocados and chestnuts is seen more commonly in patients who are allergic to latex. Latex

allergy is also seen more often in people who have frequent exposure to latex, e.g. hospital workers and those who have had several surgical operations.

Some people who have multiple allergies or allergic asthma may be more likely to experience anaphylaxis than people who have no known allergies. Most severe reactions are unpredictable.

### **Is allergy to anaesthetics hereditary?**

No. If you are allergic to an anaesthetic drug, your children are no more likely to have the same allergy than any other person. Some very rare non-allergic problems with anaesthetic drugs can occur in families, for example 'suxamethonium apnoea' where some muscle relaxant drugs can last longer than usual, and 'malignant hyperthermia' where the body can become very hot. These are NOT allergic conditions.

### **Can I be tested for anaphylaxis before I have my anaesthetic?**

**Routine skin testing is not currently recommended.<sup>6</sup>**

There are two reasons why routine skin testing is not currently recommended before surgery.

The most important reason is that a negative skin test to a particular drug does not guarantee that you will not experience an anaphylactic reaction to the same drug in the future. Skin tests are only a guide because the response of the skin to a tiny amount of the drug is not necessarily the same as giving a much larger dose of the drug directly into a vein during the anaesthetic.

A second reason is that it is possible to become sensitised to some anaesthetic drugs without ever having received the drug previously. Some common chemicals are similar to certain anaesthetic drugs. It is possible to become sensitised to these

anaesthetic drugs in everyday life after the skin test has been done.

**An important exception** is latex allergy. If you have any symptoms of latex allergy – for example, itching or a rash after exposure to latex rubber in children's balloons, rubber gloves or condoms – then you should be tested for latex allergy before your surgical operation. There are two types of test: a skin test and a blood test. Which of the tests you have will depend on their availability in your locality. If you believe you may be allergic to latex you should tell your GP well in advance of going into hospital for surgery; it is possible for the GP to send a blood sample for latex testing. It usually takes a week or two for the result to come back.

Skin testing is done by putting a tiny drop of the drug on the skin and pricking the skin lightly with a small piece of plastic shaped like a toothpick. This is not painful. A positive test produces an itchy lump on the skin. Skin testing has to be done by someone who has been trained in diagnosing allergy.

You may already know that you are allergic to certain medicines or substances. When you come into hospital, you will be asked several times if you are allergic to anything. It is very important that you pass on this information to the health professionals looking after you. If your allergy is serious, you may be advised to wear a Hazard Warning bracelet.

### **If I am allergic to an anaesthetic drug, are alternative drugs available?**

Yes, there are many different anaesthetic drugs and alternative drugs can almost always be given. Just occasionally a person is allergic to several muscle relaxant drugs and we advise the avoidance of all drugs of this type. If a person is allergic to an antibiotic or a skin antiseptic, suitable alternatives are available.

## What should I do if I think I have had an allergic reaction during an operation in the past?

If you think you might have had an allergic reaction during or after previous surgery, it is important to try to find out whether it was an allergic reaction and what caused it. It may be possible for your GP to find out from your hospital consultant what was the cause of the problem. If your GP thinks it is appropriate, you may be referred to an allergy clinic to help to find the cause.

## Where can I get more information about anaphylaxis?

- ▶ Your GP or your anaesthetist.
- ▶ Suspected Anaphylactic Reactions associated with Anaesthesia, published by the Association of Anaesthetists of Great Britain and Ireland and the British Society of Allergy and Clinical Immunology.<sup>7</sup>
- ▶ Allergy UK ([www.allergyuk.org](http://www.allergyuk.org)).

## Where can I get more information about other unwanted effects of anaesthetic drugs?

- ▶ British Malignant Hyperthermia Association ([www.bmha.co.uk](http://www.bmha.co.uk)).
- ▶ Other pages in this series.

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