Anaphylaxis Campaign
Supporting people at risk of severe allergies

Egg allergy: The facts

Egg is a common cause of allergic reactions in infants and young children. It often begins in the child's first year of life and in some cases lasts into the teenage years – or even into adulthood for a few people.

Children who develop allergy to foods such as egg often have other allergic conditions. Eczema and food allergy often occur in early infancy and later on there may be hay-fever, asthma or both.

This factsheet aims to answer some of the questions which you and your family may have about living with egg allergy. Our aim is to provide information that will help you to understand and minimise risks. Even severe cases can be well managed with the right guidance.

Many cases of egg allergy are mild, but more severe symptoms are a possibility for some people. If you believe you or your child is allergic to egg, the most important message is to visit your GP and ask for allergy tests and expert advice on management.

Throughout this fact sheet you will see brief medical references given in brackets. Full references are provided at the end.

Symptoms triggered by egg

The symptoms of a food allergy, including egg allergy, may occur within seconds or minutes of contact with the culprit food. On occasions there may be a delay of more than an hour.

Mild symptoms include nettle rash (otherwise known as hives or urticaria) or a tingling or itchy feeling in the mouth.

More serious symptoms are uncommon but remain a possibility for some people, including children. These may include:

- Swelling in the face, throat and/or mouth
- Difficulty breathing
- Severe asthma
- Abdominal pain, nausea and vomiting

In a few extreme cases there could be a dramatic fall in blood pressure (anaphylactic shock). The person may become weak and floppy and this may lead to unconsciousness.

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Some very sensitive people may even suffer breathing problems when they inhale the fumes of cooked eggs.

Where symptoms are delayed, these may include aggravation of eczema, the development of inflammation in the gut leading to reflux symptoms, difficulty swallowing, diarrhoea, constipation, abdominal pain and bloating.

Getting a diagnosis of egg allergy

If you suspect you (or your child) has egg allergy you should see your GP as soon as possible. Some GPs have a clear understanding of allergy, but allergy is a specialist subject so it is more likely that your doctor will need to make a referral to an allergy clinic. Your GP can locate an allergy clinic in your area by visiting the website of the British Society for Allergy and Clinical Immunology (www.bsaci.org).

Once you get a referral, the specialist will discuss the symptoms that have occurred as well as the medical history of you or your child. The results of skin prick tests and blood tests will also help the specialist form a diagnosis.

In many cases, doctors are not easily able to determine whether a food allergy is mild or severe. However, there will be certain clues. For example, people with asthma – especially when it is poorly controlled – are more at risk of severe allergic reactions than those without asthma.

Research has shown that having egg allergy as an infant increases the chances of developing peanut allergy (Du Toit et al., 2013). Other studies have shown that sensitisation to egg in infancy is associated with a greater probability of developing allergy to inhalant allergens such as house mites and pollens with subsequent asthma and hay fever (Warner et al., 2001). If you have a young child with egg allergy, these are all matters you should discuss with your allergy specialist.

Treating symptoms of egg allergy

If your doctor confirms that your allergy (or that of your child) is mild, then antihistamines may be considered sufficient to treat any symptoms that occur. In our experience, many medical experts prefer non-sedating modern antihistamines such as loratidine or cetirizine rather than those that may cause drowsiness such as chlorphenamine (also known as Piriton).

If the doctor thinks it likely that you (or your child) will suffer severe symptoms to egg, then you may be advised to carry a pre-loaded injection containing adrenaline (also known as epinephrine).

The adrenaline injectors prescribed in the UK at present are Emerade®, EpiPen® and Jext®. In our view these injectors are easy to use and designed for self-administration. If you are prescribed an injector, it should be

available at all times – with no exceptions. Medical attention should still be sought after use as symptoms may return after a short period and more than one injection of adrenaline may be required to control the reaction.

If you are prescribed an adrenaline injector, you will need to know how and when to use it. Ask your GP or allergist for advice. You can also find help on the website relevant to the injector you carry.

Emergency treatment of anaphylaxis – what injectors are available?

Emerade® is the most recent single use adrenaline auto-injector to become available. It has a needle guard to protect against needle stick injury. Visit www.emerade-bausch.co.uk

EpiPen® has a spring-loaded concealed needle. The built-in needle protection keeps the needle covered during and after use. Visit www.epipen.co.uk.

Jext® has a locking needle shield which engages after use, designed to protect against needle injury. Visit www.jext.co.uk.

Egg allergy and eczema

In the UK, egg is the most common food allergy associated with eczema. Sometimes egg allergy tests are negative even when egg is a cause of the eczema. If it is suspected that a food (such as egg) is aggravating a patient's eczema, sometimes the skin problem can be improved by excluding the culprit food from the diet. This should only be undertaken on medical advice. Dietitians can be very helpful in providing advice on avoiding egg and identifying suitable alternatives such as for baking cakes.

Outgrowing egg allergy

Studies have shown that many children with egg allergy outgrow it, but there are differences of opinion about the age at which this occurs. A 2007 American study concluded that four per cent of the children taking part in the research outgrew their egg allergy by age four, 12 per cent by age six, 37 per cent by age ten and 68 per cent by age 16 (Savage et al., 2007). Other studies have suggested that a larger number may outgrow their egg allergy before they reach their teens.

UK researchers have published significant findings focusing on the outgrowing of egg allergy (Clark et al., 2011). At first children outgrow their allergy to well-cooked egg as an ingredient (for example, in cake), whilst they will still react to lightly cooked egg (for example, in pancakes). Over the following months or years they will begin to tolerate lightly cooked egg and finally uncooked but pasteurised egg, for example in mayonnaise. Even when they can eat any form of egg, rubbing raw egg on to the skin may still cause a mild nettle rash; the researchers say this is nothing to be concerned about and just represents the final stage of the allergy. Your allergy specialist can guide you about the best time to re-introduce each type of egg into the diet and whether or not this can be done at home. Repeating the allergy skin or blood tests is

often used by specialists as a guide to decide when the allergy is improving.

Many children who have grown out of egg allergy dislike the taste of egg and no longer wish to eat it. This is quite normal.

In addition to these findings, researchers have also suggested that where people with egg allergy can tolerate baked egg, it should be introduced into their diets. It is possible this may accelerate the development of their tolerance to egg. However, it is vital to stress that this should only be carried out in consultation with an allergy specialist. The research is not yet conclusive and is ongoing (Leonard et al., 2012).

Avoiding egg

Egg can be found in a wide range of foods, including cakes, pastries, desserts, meat products, mayonnaise and other salad dressings, soups, mousses, glazes, pasta, noodles, battered and bread crumbed foods, ice cream, chocolates and sweets. This list is not complete and the key point to remember is that you must always read food labels thoroughly if you have an egg allergy. All pre-packaged food sold within the EU, including the UK, must declare and highlight the presence in the ingredient list, of major allergens including egg, even if they appear in small quantities. The word egg must be stated in the ingredient list in a way that makes it clear to the consumer of its presence. Egg must be declared whenever various ingredients are present including the following:

- Whole egg
- Dried egg
- Egg white and egg yolk
- Egg proteins, including albumin (which is egg white), ovalbumin (which is the main protein found in egg white), globulin, ovoglobulin, livetin, ovomucin, vitellin and ovovitellin
- Lysozyme, which is an enzyme that can be derived from egg white. It may trigger symptoms in a small percentage of people with egg allergy
- Lecithin (E322), which can be derived from egg. Egg lecithin can be found in some foods and used in the manufacturing of some medicines. Your pharmacist should be able to supply information about any medicines you are prescribed.

When cooking at home, where eggs are required for a particular purpose such as binding or leavening, you could try an egg replacer – such as one of those marketed with vegans in mind.

The food allergen labelling laws that cover pre-packed food now also apply to the catering sector. When eating out or buying takeaway food, food businesses will be required to provide information on allergenic ingredients. This information can be provided in writing and/or orally. If information is provided orally, the food business will need to ensure that there is some sort of written signage that is clearly visible to indicate that allergen information is available from a member of staff. Systems should also be in place to ensure that, if

requested, the information given orally is supported in a recorded form (in writing for example) to ensure consistency and accuracy.

In some other European countries, food businesses are required to provide the information only in writing. You should also question staff very directly, asking whether egg is an ingredient of the food you have chosen or whether there is a risk of cross-contamination. Don't be afraid to ask the waiter to check with the chef.

What else might I react to?

People who react to hen's eggs are advised not to eat eggs from ducks, geese, quails or other birds because they may react to any egg. In very rare cases, someone allergic to hen's egg may not be able to eat chicken.

Vaccines and egg allergy

The following information is based on what we believe to be sound research. Nevertheless all cases are different and we advise you to discuss your allergy (or that of your child) with your doctor before the following vaccinations are given.

The MMR: The MMR vaccine is normally cultured on cells from chick embryos. However, the British Society for Allergy and Clinical Immunology (BSACI) has noted that the vaccine is generally free of egg protein, the part of the egg that triggers allergic reactions (BSACI, 2007).

The British National Formulary – the medical and pharmaceutical reference book that contains information and advice on medicines – says there is increasing evidence that MMR vaccine can be given safely even when the child has had an anaphylactic reaction to food containing egg (Joint Formulary Commitee, 2013).

A 2010 medical paper written by UK experts said: "All children with egg allergy should receive their normal childhood immunizations, including the MMR vaccination, as a routine procedure performed by their family doctor/nurse…Studies on large numbers of egg-allergic children show there is no increased risk of severe allergic reactions to the vaccines. Children who have had documented anaphylaxis to the vaccine itself should be assessed by an allergist." (Clark et al., 2010).

The flu vaccine: This vaccine is prepared on hen's eggs and may contain tiny amounts of egg protein. Recent research suggests that flu vaccines present a very low risk of anaphylaxis for people with egg allergy even when the allergy is severe (Greenhawt et al., 2012). In our view, people who have suffered severe reactions to egg (such as breathing difficulties or collapse) should have their case assessed by an allergy specialist before having the flu vaccine. This also applies to anyone with egg allergy whose asthma is difficult to control. In some cases it may be decided that the benefits of being vaccinated outweigh the risk of a reaction. In these cases either a 'no-egg' or 'low-egg' vaccine can be given and this is usually tolerated.

Recently a new flu vaccine has been introduced for children which is not injected but sprayed into the nose

(Live attenuated influenza vaccine – LAIV). This is the recommended vaccine for the childhood flu programme. While this also contains minute quantities of egg protein, research has shown that it can be safely administered to children with egg allergy (Turner et al., 2015). However Public Health England (an agency of the Department of Health) has advised that children with a history of **severe anaphylaxis to egg** that has required intensive care should be referred to specialists for immunisation in hospital (Public Health England, 2015). Egg-allergic children with asthma can receive LAIV if their asthma is well-controlled.

The yellow fever vaccine: If yellow fever vaccination is required in people with any degree of egg allergy, then they should ask for a referral to an allergy specialist. The vaccine contains small amounts of egg protein but medical experts say it can be administered successfully by split doses in some circumstances (Rutkowski et al., 2013).

The EAT study

The prevention of food allergy in children was a major focus of the EAT study (Enquiring About Tolerance). The study's authors showed that in exclusively breast fed babies, the early introduction of egg (in high doses) from four months onwards is associated with less egg allergy compared with delaying weaning on to allergenic foods (Perkin et al., 2016). It shows similar effects for peanut. However, these findings have not yet resulted in a change of national policy, and parents are advised to approach their health visitor with questions about the introduction of egg to babies and infants.

Hope for the future

Researchers in various countries, including the UK and USA, are working on a treatment for food allergy called oral immunotherapy. This involves the allergic patient eating small but ever-increasing amounts of the problem food in a hospital setting over a period of months. The hope is that the person will eventually become tolerant to the food they were allergic to. There has been preliminary success with various foods including egg (Burks et al., 2012). However it must be stressed that research is still in its early stages.

The key messages

A diagnosis of a food allergy can be daunting but by thinking ahead and employing coping strategies, people affected can get on with their lives.

- See your GP and ask for a referral to an allergy clinic
- Always be vigilant when food is around
- Check food labels
- Be proactive when eating out
- Carry prescribed medication everywhere
- If you carry an adrenaline auto-injector, learn how and when to use it
- Ensure that asthma is well managed.

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Reviewers

The content of this Factsheet has been Peer Reviewed by Prof John Warner, Early Years Theme Lead for the CLAHRC for NW London (the Collaboration for Leadership in Applied Health Research and Care); and Sue Clarke, Specialist Allergy Health Visitor in West Essex.

Disclosures

Professor Warner sits on the scientific advisory boards for Nutricia/Danone and Airsonette; is a paid lecturer for the above and Merck, and Astra-Zeneka; has received research grants from Danone, Airsonette, Allergy Therapeutics and Lincoln Medical; was until recently a member of the ACNFP (FSA); RCPCH council and trustee; and past-President of the Academic Paediatric Association. In the past (1996-2008) he was the lead investigator, chair of an advisory board and paid lecturer for UCB pharma on research into the use of cetirizine and levo-cetirizine in infants with eczema. He has also received grants from the FSA to study the early life origins of egg allergy. Prof Warner was co-author of some of the research referenced above.

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Disclaimer – The information provided in this Factsheet is given in good faith. Every effort has been taken to ensure accuracy. All patients are different, and specific cases need specific advice. There is no substitute for good medical advice provided by a medical professional.

About the Anaphylaxis Campaign: *Supporting people at risk of severe allergies*

The Anaphylaxis Campaign is the only UK wide charity to exclusively meet the needs of the growing numbers of people at risk from severe allergic reactions (anaphylaxis) by providing information and support relating to foods and other triggers such as latex, drugs and insect stings. Our focus is on medical facts, food labelling, risk reduction and allergen management. The Campaign offers tailored services for individual, clinical professional and corporate members.

Visit our website www.anaphylaxis.org.uk and follow us on Twitter @Anaphylaxiscoms.