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Food allergies in children



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Contents

Food allergies in children	3
Mechanisms of food allergies	5
Symptoms in infants	6
• Rash	
• Gastrointestinal symptoms	
Diagnostics	8
• Exposures	
• IgE testing	
Allergen avoidance	10
• Milk allergy	
• Wheat allergy	
Avoiding unnecessary dietary restrictions	12
Pollen sensitivities	13
Lactose intolerance	14
Managing food allergies at nursery and school	15
“May contain nuts”	15

Food allergies in children

About 3 to 9 % of children under the age of 2 are allergic to at least one food. The route of allergic sensitisation is still unclear: according to current understanding, ingestion of food normally results in the development of tolerance, whereas exposure through skin contact or inhalation is more likely to result in the production of IgE antibodies and the development of allergy. Food allergies typically develop during the first year of life. Babies with milk allergy, for example, usually begin to exhibit symptoms between 3 to 6 months of age. On the other hand, cross-reactions between birch pollen and foods such as apple and carrot usually emerge in children aged 3 to 6 years, or later.

A child can become sensitised to any food, but in most cases, the sensitisation reflects the common foods and their quantities in the child’s living environment. Fruit and vegetables usually cause temporary skin symptoms that disappear quickly. It is important to determine whether a child under 2 years of age is allergic to milk or wheat and other grains to ensure the normal growth and development of the child. Egg is an even more common allergen compared to milk, wheat being the third most common allergen.

People allergic to wheat often also react to barley and rye. The protein composition of oats is so different from

“Food allergies usually develop during the first year of life”

the protein composition of wheat that most children who are allergic to wheat can tolerate oats.

Most children with delayed hypersensitisation characterised by skin or gastrointestinal symptoms with no underlying IgE response outgrow food allergies between the ages 2 to 3 years. Recovery from IgE-mediated allergies usually takes longer but in most children, food allergies go away gradually by the age of 7 years.

Other food allergies in preschoolers and school age children are fish and tree nut allergies and allergies to numerous fresh fruit and vegetables caused by pollen cross-reactivity. Cross-reactivity occurs when the child’s immune system recognises proteins in fruit and vegetables that are similar to the proteins in pollen. In these cases, ingestion of the food allergen causes symptoms like stinging, swelling of lips and itching mainly in the mouth area, although children may often feel itching in their ears as well. ■



Mechanisms of food allergies

People with atopy are predisposed to become sensitised by developing IgE antibodies to foods. The development of antibodies requires exposure to the substance that causes sensitisation at least a few times. The most common form of food allergy is atopic allergy. IgE antibodies to milk, for example, can be detected in about 70 % of children under the age of one who have milk allergy. IgE-mediated reactions are typically characterised by quick reactions that manifest in minutes or at the latest within a couple of hours of ingestion. The symptoms include hives and swelling caused by it, skin redness (erythema), vomiting, abdominal pain, constriction of airways and, in a worst case scenario, a severe allergic reaction affecting the whole body (anaphylaxis).

“The most common form of food allergies is atopic allergy.”

Some symptoms of food allergies may take days to develop. Most children with symptoms like these suffer from worsening atopic eczema or diarrhoea. If the rash keeps spreading and getting worse day after day and if the child's stools become increasingly watery, it is advisable to have the child checked for food allergies. Since the mechanism of a food allergy like this is usually not mediated by antibodies but rather by cells, allergy tests are not a viable diagnostic tool. ■



Symptoms in children under one year of age

Rash

Atopic dermatitis (AD) is characterised by itching, and scratching causes sleepless nights for both the child and the parents. Although the cause of the eczema is sometimes attributed to food allergies, atopic dermatitis is an independent condition. Atopic dermatitis involves a genetic variation affecting the permeability of the skin, making the skin dry and easier for allergens to penetrate compared to normal skin. Only a few per cent of mild cases of AD are accompanied by food allergies, whereas in more than half of children under one year of age suffering from severe AD, food allergies may worsen the symptoms. It is recommended to rule out allergies if the dermatitis covers a large area of the child's skin and responds poorly to treatment with moisturisers (emollients), or if the child is restless due to constant itchiness. Allergies are not a significant cause of dry skin in children under one year of age or dermatitis in children over the age of two.

Children under the age of one year can experience many other skin symptoms in addition to eczema. Exanthema (red skin eruptions), redness and occasional bouts of hives are typical. If these symptoms recur on large areas of the skin after the ingestion of a certain food, it is often a sign of an allergic reaction. On the other hand, babies' cheeks are often a little flushed after eating. ■

Gastrointestinal symptoms

Gastrointestinal symptoms include vomiting, diarrhoea and abdominal pain. It is common for food allergies to cause symptoms in more than one organ and tissue system; most children with skin symptoms also have gastrointestinal symptoms. Allergic reactions on the mucous membranes lining the intestines often result in intestinal motility problems and diarrhoea, and sometimes in constipation. Food allergies are not, however, a common cause of constipation.

Predicting the bowel movements of small children is difficult for both parents and healthcare professionals. Some babies have a bowel movement three times a day, while others once in three days – both of which are within the normal range. There might also be significant variation in the stool colour and consistency: sometimes the stools can be green and loose or yellow and solid, both of which are normal.

Spitting up (also known as possetting) is a part of the normal life of babies. Breastfeeding inevitably causes air to col-

“Gastrointestinal symptoms include vomiting, diarrhoea and abdominal pain.”

lect in the baby's stomach. The muscle (lower oesophageal sphincter) between the oesophagus and the stomach in babies under one year of age is loose to allow the majority of the air to escape from the stomach. Excessive vomiting every time after ingesting milk, on the other hand, is an atypical symptom that needs to be investigated.

Significant gastroesophageal reflux (GER, a condition where stomach contents come back up into the oesophagus) is characterised by poor weight gain. Too hastily started reflux medication without appropriate diagnosis is not beneficial to the baby.

Gastrointestinal symptoms are often accompanied by irritability and restlessness and evaluating the severity of these can be difficult for the parents and sometimes impossible for outsiders. What some parents might consider stressful and agonising screaming can be completely normal for others. If the baby's weight gain is steady and all other abnormalities have been ruled out, crying and restlessness are rarely the only symptoms of food allergies. ■



Diagnostics

Exposures

Food allergy diagnoses are always based on allergen exposure-avoidance tests. The suspected food must be eliminated from the child's diet for one to two weeks, during which time the parents record the child's symptoms in a diary. The avoidance response is considered positive if for example a rash or vomiting tendency goes away during this time. After this, the suspected food will be reintroduced to the diet either by trying it at home or through an exposure test conducted by a healthcare professional. If no clear symptoms develop during the day of the testing, parents will continue giving the food to the child and recording the symptoms in a food diary.

A clear difference in the symptoms between the avoidance and testing weeks confirms the food hypersensitivity. The only accurate diagnostic test for detecting food allergies is a double-blind exposure test after an avoidance period. A double-blind test means that the doctor overseeing the test and the parents of the child do not know which one of the products

the child will be exposed to contains the suspected allergen. Double-blind exposure tests are mainly used in the diagnostics of milk and wheat allergies when the allergy tests yield negative results and reading the symptoms poses a challenge for both the parents and the doctor.

Exposure tests involving milk and wheat, which play a key nutritional role in the child's growth and development, are mainly conducted under the supervision of a healthcare professional in a hospital or other similar setting.

In cases of suspected extreme and severe allergic reactions (anaphylaxis), supervised exposure tests can be conducted for other foods, such as egg and nuts. ■

IgE testing

Skin prick testing (SPT) demonstrating IgE antibodies or serum-specific IgE testing are diagnostic tools for testing atopic sensitisation. Both parents and doctors rely on these tests too much. Especially older children often test positive for IgE antibodies even though they can tolerate the tested food perfectly well. As such, a positive skin prick test result is not a clinically sufficient indicator of an allergy. The size of the bump caused by the allergen or the amount of an allergen-specific IgE are, however, indicators of the likelihood of allergies. Many children who are allergic to birch pollen react to foods that cross-react with the pollen, such as apple, carrot, hazel nuts and soy. The symptoms are usually mild as the allergen molecules causing them often disintegrate in the digestive system. However, patients with a sensitivity to the storage proteins that

can better withstand the enzymes of the digestive track may experience severe symptoms. This can be examined with component-resolved diagnostics, which is used to determine the molecules for which the patient has IgE antibodies. For example for patients with nut allergy, component-resolved testing indicates the likelihood of a severe reaction.

The symptom and its rate of development are significant indicators of how likely the allergy test conducted can reveal whether the child is allergic or not. A negative IgE antibody test result does not rule out allergies.

In a third of children with milk allergy, for example, the condition is not mediated through IgE, meaning it cannot be measured in skin prick tests or IgE blood tests. The most important symptoms of these children are a rash and various gastrointestinal symptoms that develop within a few days of ingesting the food. When these children are tested for allergies, the markers measuring IgE are rarely positive. In children whose symptoms include hives and redness, on the other hand, the IgE response is usually positive. ■



Allergen avoidance

Milk allergy

The diet of a child with a milk allergy should not contain any forms of milk proteins during the diagnostic stage. Fresh and processed foods contain several ingredients that refer to milk, such as casein and hydrolysate.

Milk allergy is diagnosed with allergen exposure-avoidance tests. In babies under the age of 6 months, treatment is started with special formulas where the protein has been broken down (e.g. Althera, Nutrilon Pepti, Nutramigen and Profylac). For babies above the age of 6 months, soy milk is a good first option (e.g. Nutrilon Soija). Should the skin or gastrointestinal symptoms continue after switching to a special formula or soy milk, it is advisable to conduct the exposure-avoidance test again. This time the products used during the avoidance period are amino acid based special formulas (e.g. Neocate and similar formulas), and the product used in the exposure test is a special formula that causes symptoms. If the results of this test are also clear, the baby is switched to an amino acid based special formula.

According to studies conducted in Finland, only a few per cent of children

with milk allergy are so hypersensitive to broken down milk protein that they need an amino acid based product. Switching the baby to an amino acid based formula in the early stages of milk allergy diagnosis process is not beneficial to the baby nor the parents. We do not yet have enough information about the development of natural tolerance in long-term use where the immune system is not exposed to even small pieces of milk protein. Amino acid based products are also significantly more expensive than other formulas.

If the child grows normally and enjoys a diet suitable for their age (apart from milk), they can be switched to for example oat or soy milk at around one year of age. Parents must, however, ensure that the child gets enough calcium and vitamin D from other sources. If the infant gains weight or grows slowly or poorly and/or has a poor or limited appetite, feeding with special formulas and other special products must be continued until the child is 18 to 24 months of age. Some children over the age of one who are allergic to milk can tolerate extensively heated (oven cooked at or above 175 °C for 30 minutes) milk when used as an ingredient in other foods and baked products even if they cannot consume fresh milk. This makes the child's diet considerably less limited and might even speed up the recovery from allergies. ■

Wheat allergy

The exact prevalence of wheat allergy is not known but it is thought to affect less than one per cent of children under the age of two. Diagnostic tools such as skin prick tests or specific IgE blood tests are in practice useless when testing with an allergen product extracted from whole wheat, but sensitisation to gliadin, which is a component of gluten, is most clearly linked with allergies. In practice, the diagnosis is always based on exposure-avoidance tests. Like milk allergy, wheat allergy usually develops in children under the age of one, and in most cases, the symptoms go away by age seven. Children with wheat allergy are often also allergic to rye and barley, but the majority can tolerate oats. Other species of wheat, such as spelt and durum wheat, are not suitable wheat substitutes for children with wheat allergy. ■

“Milk allergy is diagnosed with allergen exposure-avoidance tests.”



Avoiding unnecessary dietary restrictions

When expanding the dietary choices of a child with a food allergy, the goal is to achieve a diet that requires as few special foods as possible. The problem with elimination diets (or 'treatment diets' in this case) is the narrow range of food choices that may lead to inadequacies in the intake of important nutrients. The eliminated foods should be replaced with foods that have a similar nutritional composition, so for example wheat is usually replaced with oats or buckwheat. It is unlikely that a child with beef allergy could not tolerate pork.

As such, there is no need to use exotic meats such as ostrich or Finnish reindeer meat. Similarly, there is no need to introduce quinoa or sweet potato to the child's diet unless these already are the family's staple foods. In most cases, it is possible to create a balanced diet using foods readily available in Finland. If the child's dietary choices are so limited that it affects their intake of several nutritionally important foods, a dietitian should be consulted to ensure proper nutrient intake.

In the past, foods such as fish and many other "classic" or "generally allergising" foods were eliminated from an allergic child's diet even up to two years of age. These lists of allergising foods were not based on adequate scientific

data. Food allergies or other allergies with later onset cannot be prevented by eliminating certain foods to be on the safe side, and a narrow and unbalanced diet of a baby under the age of one may in fact increase the baby's risk of developing a food allergy. Different allergy diets are easily followed for an unnecessarily long period of time, potentially causing worry and resulting in unnecessary dietary habits.

When a child's diet is expanded, it is advisable to do it by introducing one or two new foods in a week. If the child develops gastrointestinal symptoms or worsening atopic eczema a week after the introduction of a certain food, it is unlikely that the food in question is the cause of the reaction.

Majority of the children who do not have an IgE-mediated milk hypersensitivity accompanied by skin or gut symptoms outgrow the condition by the time they are two to three years of age. One in four children with milk

allergy caused by an immunological IgE-mediated sensitisation still shows symptoms of the allergy at the age of five. More or less the same also goes for egg and wheat hypersensitivity.

To speed up the rate at which the child outgrows the allergy, the eliminated food should be tested by reintroducing them to the child's diet at regular intervals. If the child's first symptom was anaphylaxis or a rapidly developing severe allergic reaction when they first tried the food, reintroduction of the food must be done under the supervision of a health care professional. During the first three years, foods can be reintroduced

to the child's diet every six months and after this about once a year.

Foods must not be eliminated from a child's diet for unnecessary reasons. The older the child is, the more the diet should be based on evidence-based information. A healthcare professional will assess whether the elimination diet is based on necessary avoidance of certain foods and whether a consultant will need to re-evaluate the child's situation at the latest at the child's five-year checkup. The goal is that by the time the child starts school, they only avoid foods determined by a doctor with experience in allergy management. ■

Pollen sensitivities

Pollen allergies develop in many atopic children between the ages two to seven. The first one to develop is birch pollen allergy, which also causes the strongest symptoms. The antibodies developed against birch pollen also recognise proteins present in raw fruit and vegetables due to cross-reactivity, meaning that the proteins have similar components that the child's immune reaction identifies. In these

cases, ingestion of certain foods causes symptoms like stinging, swelling of lips and itching mainly in the mouth area, although children often feel itching in their ears as well. This condition is also known as 'oral allergy syndrome' or OAS. As its symptoms are not limited to the mouth area as they also include runny nose, eye symptoms, hives, and anaphylaxis, the more appropriate name of the condition is pollen food syndrome



“Diet should be based on evidence-based information.”

(PFS). Children with PFS usually have the condition also as adults. Ingestion of certain foods, such as tree nuts or kiwifruit, may cause severe reactions, including even anaphylaxis. Based on current information, it seems that in these cases, the patients are sensitive to a broader and different range of proteins compared to people with PFS.

Children with pollen sensitivities do not need to avoid raw fruit and root vegetables if they do not cause clear symptoms. Nearly everyone with a food allergy can tolerate these foods if they

are cooked or processed into juices. The purpose of the lists of fruit, vegetable and root vegetables that cause symptoms is only to guide the patient to keep an eye on certain foods if they cause harmful symptoms. Allergy tests are in order when determining the cause of severe reactions, but a list of foods to be avoided should not be based on a skin prick test. In most cases, children discover the foods they need to avoid by themselves.

Finally, it is worth mentioning that listing for example carrot allergy as a special dietary requirement may result in the food provider unnecessarily eliminating all forms of carrots even though only raw carrot needs to be avoided. ■

Lactose intolerance

Lactose intolerance is often confused with milk allergy. Approximately 17% of Finns have hypolactasia, a congenital deficiency of the lactase enzyme that breaks down lactose (milk sugar). Intestines of the people with hypolactasia cannot break down large amounts of lactose, and as a consequence they experience diarrhoea, flatulence and abdominal pain.

Lactose intolerance is an extremely rare condition in infants under the age of one with less than 100 of such cases

reported globally. Breast milk contains large amounts of lactose and the babies with congenital lactose intolerance are tested at a very early age due to diarrhoea and poor weight gain. Lactose intolerance develops gradually between the ages two to seven and most often in school age children. As such, there is no need for parents to start a one-year-old on a lactose-free diet due to gastrointestinal symptoms on their own initiative. ■

Managing food allergies at nursery and school

Allergy diets pose great requirements to food manufacturers and institutional kitchens, and they are also a cause of major additional costs. As such, it is important that children and parents only report foods confirmed by an allergist to the food providers in nurseries, schools and other similar institutions. Persons with severe food allergies have the right to receive accurate information from their doctor about the allergens they definitely need to avoid, and they also have the right to be able to ensure that they are not exposed to the foods or ingredients

that cause dangerous symptoms. The child and parents should only eliminate the ingredients that have caused genuine and significant symptoms from the child's diet regardless of whether the food is prepared by the parents or a commercial/institutional kitchen. Additives and spices are still often avoided in nurseries and schools, but it should be borne in mind that in Finland, these have never been reported as the cause of anaphylaxis in a child under the age of seven. Spices and food additives are an extremely rare cause of food allergies in small children. ■

“May contain nuts”

Expressions like these are often seen on food packaging. These warnings are misleading. There are many children with tree nut allergies in Finland, but the majority of them only experience mild symptoms due to birch pollen allergy. In cases like this, there is no need to avoid products with a warning like this. Patients who have suffered anaphylaxis, on the other hand, should avoid products that might contain a certain allergen due to contamination in the manufacturing process.

In Finland, food packaging label texts are governed by a law based on EU directives, and the ingredients that cause hypersensitivity and which must be mentioned on food packaging are clearly listed in this decree. Ingredients like these are gluten-containing grains and cereals, shellfish, molluscs, egg, fish, tree nuts, milk, celery, mustard, sesame seeds, sulphur dioxide and sulphites (less than 10 mg in a kilogram or litre). ■



We are sensitive

Nearly a half of Finns suffer from allergy symptoms at some point in their lives. Asthma affects one in ten Finns. Allergy and Asthma Federation is a public health organisation with an aim to improve the quality of life of those with allergies and asthma.

Allergy and Asthma Federation provides materials for coping with allergies. To order the materials, contact the Federation or visit www.allergia.fi. The Allergia & Astma magazine published by the Federation is another good source of information (available in Finnish).

Allergy helpline, tel. +358 (0)600 14419

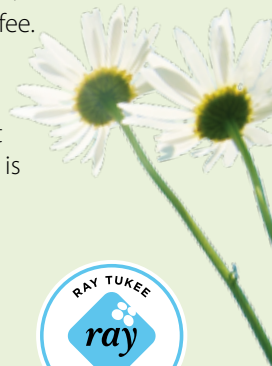
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