

Food Allergy as Seen by a Paediatric Gastroenterologist

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ABSTRACT

Approximately 7% to 8% of children are affected by food allergies, the most common being cow's milk allergy (CMA), and egg and peanut allergies. The occurrence of CMA decreases with age, but it is often replaced by other allergic manifestations. CMA affects mainly the skin and gastrointestinal tract, and reactions mediated via immunoglobulin E manifest differently to those that are not. Gastroesophageal reflux disease is frequently present in the first year of life and may be associated with CMA. Eosinophilic oesophagitis is related to food allergy and aeroallergens, less common than gastroesophageal reflux disease, and generally occurs in older children. Eosinophilic oesophagitis manifests as classic symptoms of reflux plus dysphagia. Treatment includes allergen avoidance and local steroid treatment. Other manifestations of

CMA include eosinophilic gastroenteritis and proctocolitis. Accurate diagnosis of food allergy and the causative food is important because the condition is present in only about one third of patients with suspected food allergy, may be due to foods other than those originally suspected, and elimination diets may be detrimental to the child's health. Differential diagnosis is important to rule out upper and/or lower gastrointestinal disorders. Food allergy is generally treated with a hypoallergenic diet; antihistamines and leukotriene receptor antagonists may be used in specific conditions. *JPGN* 47:S49–S52, 2008. © 2008 by European Society for Pediatric Gastroenterology, Hepatology, and Nutrition and North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition

Food allergies have been reported to occur in 7% to 8% of the paediatric population (1). Cow's milk allergy (CMA) is the most common allergy and has consistently been shown to occur in 2% to 3% of the infant population (2,3). Egg allergy occurs in 1% to 2% (4) and peanut allergies affect 0.3% of children (5–7).

GASTROINTESTINAL MANIFESTATIONS OF COW'S MILK ALLERGY

CMA tends to remit spontaneously at roughly 50%/year during the first few years of life, but it is often replaced by other manifestations of allergy as part of the "allergic march." CMA may affect several organs, but predominantly the skin and the gastrointestinal (GI) tract. The mechanisms involved include both immunoglobulin E (IgE)- and non-IgE-mediated reactions (Table 1, Fig. 1) (8–10). IgE-mediated allergic reactions can occur within seconds to minutes; allergies that take days to weeks to appear are more often non-IgE-mediated. GI manifestations of CMA can occur in all parts of the GI tract such as the oesophagus, stomach, small intestine, and/or colon and rectum.

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GASTROESOPHAGEAL REFLUX DISEASE AND CMA

Within the GI tract, several distinct syndromes present themselves in relation to age and organ. Gastroesophageal reflux disease (GERD) is a disease that commonly occurs during the first year of life, and some forms of severe GERD have been shown to be associated with CMA. A double-blind placebo controlled food challenge (DBPCFC) study was performed in 45 children 3 years old and older with symptoms of GERD. Of these, 18 had severe GERD as indicated by endoscopic oesophagitis and/or reflux index (RI) >10% as measured by pH probe. Cow's milk hypersensitivity was demonstrated in 10 of 18 children reporting a significantly higher RI following 48 hours of pH monitoring compared with children without GERD or those with GERD only ($P = 0.03$; Figure 2) (11). RI is the percentage of time during a pH study that the patient's oesophagus is exposed to acid and the normal value for children older than 1 year is <6%. Subgroup classification demonstrated that in children with GERD and CMA:

- 1 of 10 had a positive skin prick test (>3 mm)
- 5 of 10 had a positive skin patch test with erythema
- 2 of 10 displayed a phasic pH pattern
- 4 of 10 had duodenal nodules, probably representing a nonspecific immune reaction.

TABLE 1. Manifestations of cow's milk allergy (9)

IgE mediated	GI: oral allergy syndrome, GI anaphylaxis Cutaneous: urticaria, angioedema, morbiliform rashes, and flushing Respiratory: acute rhinoconjunctivitis, bronchospasm (wheezing) Generalised anaphylactic shock
Mixed IgE and non-IgE mediated	GI: allergic EO and gastroenteritis Cutaneous: atopic dermatitis Respiratory: asthma
Non-IgE mediated	GI: food protein–induced enterocolitis, proctocolitis and enteropathy syndromes, coeliac disease Cutaneous: contact dermatitis, dermatitis, herpetiformis (coeliac disease of the skin) Respiratory: food-induced pulmonary hemosiderosis (Heiner syndrome), rare

CMA, cow's milk allergy; EO, eosinophilic oesophagitis; GI, gastrointestinal; IgE, immunoglobulin E. Adapted from Sampson et al (9).

EOSINOPHILIC OESOPHAGITIS IS A
DISTINCT ENTITY

Eosinophilic oesophagitis (EO) is a distinct entity that occurs mainly in children 5 to 15 years old, and appears to be related to food allergy and, to a lesser extent, aero-allergens, in the majority of cases (Figure 3) (12–14). Data from the United States indicate that there is an increasing prevalence of new cases of EO in children (13). Retrospective data from the US and Australia consistently demonstrate that the annual incidence is approximately 1/10,000 population (12,13,15). In adults and children, the symptoms of EO are dominated by the conventional symptoms of reflux but also include dysphagia, which is highly specific to EO (13). Significantly increased thickness of the oesophageal wall has also been demonstrated in patients with EO (16). Treatment includes allergen avoidance and, if ineffective, local steroid treatment (17).

Other syndromes include eosinophilic gastroenteritis and eosinophilic proctocolitis. Eosinophilic gastroenteritis is not clearly defined; it was previously classified into mucosal, mural, and serosal types. The latter is accompanied by protein loss. These forms of disease show a positive response to amino acid–based formula, however persistence of disease has been demonstrated 2.5 to 5.5 years after initiation (18). Eosinophilic proctocolitis is characterised by rectal bleeding (approximately 20% of

cases caused by CMA) (19,20), diarrhoea, and colic and occurs in infants 0 to 24 months old. Eosinophilic proctocolitis can occur in infants who are exclusively breast-fed (19).

DIAGNOSIS AND MANAGEMENT OF
FOOD ALLERGY

It is important to diagnose a food allergy given that only one third of patients who themselves or their parents believe that symptoms are caused by food allergy actually have that suspicion confirmed (3). Foods other than those suspected may be responsible for the symptoms. Adherence to a diet without proper guidance may have a negative effect on growth and development (16,21,22).

The diagnostic strategy in infants who are suspected of having food allergy should involve a 2- to 4-week elimination diet, followed by either an open challenge or a DBPCFC to confirm or exclude a food allergy. Based on previous experience (2), DBPCFC should be conducted in adults and in children 3 years old and older.

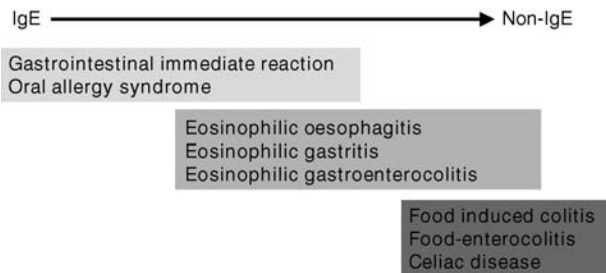


FIG. 1. Classification of food allergies within the gastrointestinal tract. IgE, immunoglobulin E. Adapted from Sampson et al (10).

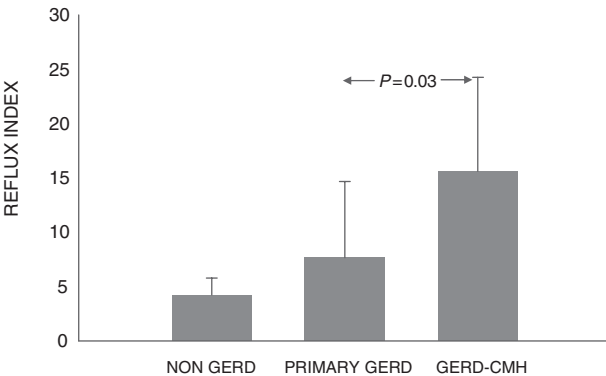


FIG. 2. Reflux index after 48 hours of monitoring in children with gastroesophageal reflux disease ± cow's milk hypersensitivity. Bars denote median value (error bars represent 75th percentile). GERD, gastroesophageal reflux disease. GERD-CMH, gastroesophageal reflux disease-cow's milk hypersensitivity. Adapted from Nielsen et al (11).

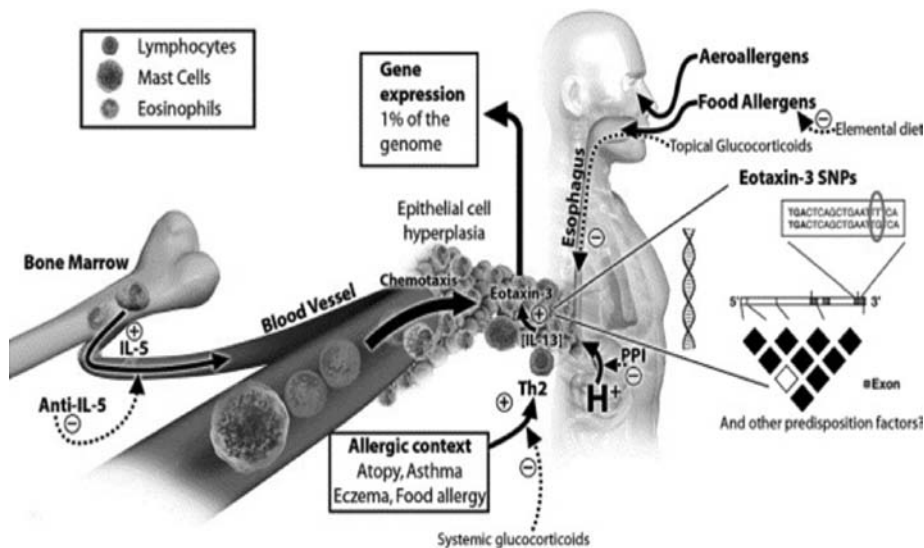


FIG. 3. Eosinophilic oesophagitis. Reproduced from Blanchard et al (14).

Differential diagnosis is important; infants can present with upper GI symptoms (eg, infection, colic, GERD, pyloric stenosis) or lower GI symptoms (eg, infection, constipation), which may or may not be related to food allergy. Children may present with infection, lactose intolerance, toddler's diarrhoea, constipation, malabsorption, and inflammatory bowel disease.

Treatment largely consists of a hypoallergenic diet and prevention, and in special cases antihistamines may be used. In patients with EO, local steroids have demonstrated efficacy in double-blind controlled challenges and leukotriene inhibitors have been shown to be effective in small uncontrolled studies. In infants with CMA, hydrolysed formula may be given, and in children a cow's milk-free diet should be initiated.

SUMMARY

CMA is a common disease in early childhood, which is part of the "allergic march." Recently recognised GI manifestations such as EO pose specific diagnostic challenges. It is important to diagnose CMA to avoid unnecessary elimination diets. The treatment of GI manifestations of CMA relies on avoidance of cow's milk protein and dietary measures depending on the age of the child. Supportive treatment may also be included (eg, local corticosteroids in EO). Appropriate formula substitutes such as those containing extensively hydrolysed protein or, if not tolerated, amino acid-based formulas, should be used to secure appropriate energy and micronutrient needs.

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