
بسم الله الرحمن الرحيم

Food allergy

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Definition

- Food allergy : adverse immunologic response to a food protein.
- Food allergy versus other non-immune mediated adverse reactions to foods
- Particularly since more than ٢٠% of adults and children alter their diets due to perceived food allergy.

Adverse Food Reactions

Food Intolerance (adverse physiologic responses)

eg: lactose intolerance

Food Allergy (immunologic responses):

IgE mediated

Non IgE mediated

Mixed

- Adverse reactions that are not classified as food allergy include:

- Lactose intolerance
- Reactions to toxic contaminants (e.g., bacteria in decomposing scombroid fish will convert histidine to histamine)
- Pharmacologically active food components

  (e.g., caffeine in coffee causing jitteriness

  tyramine in aged cheeses triggering migraine)or

  benzoic acid.

Food Allergy

- IgE Mediated
- Mixed IgE Mediated and Non–IgE Mediated
- Non–IgE Mediated

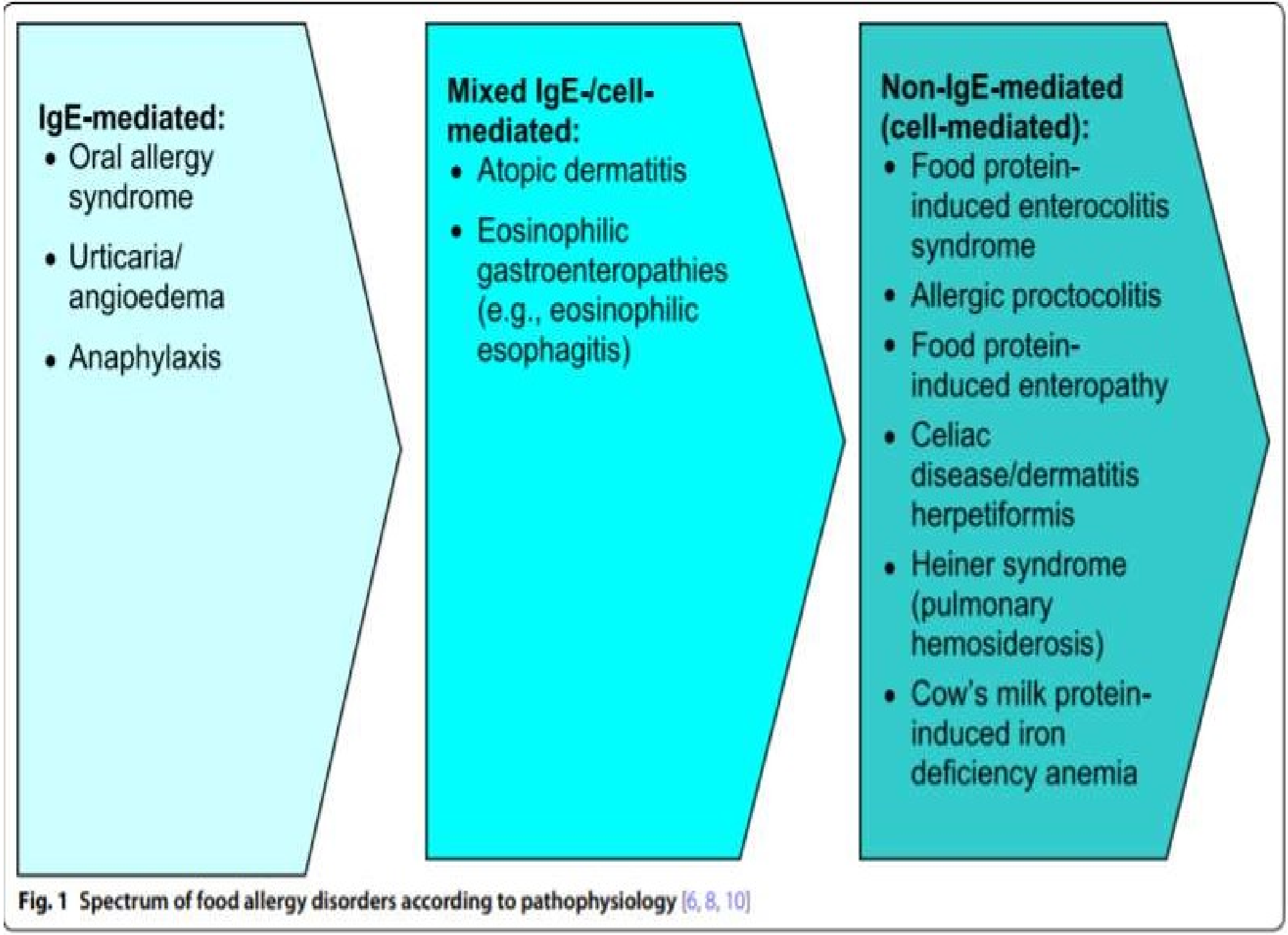


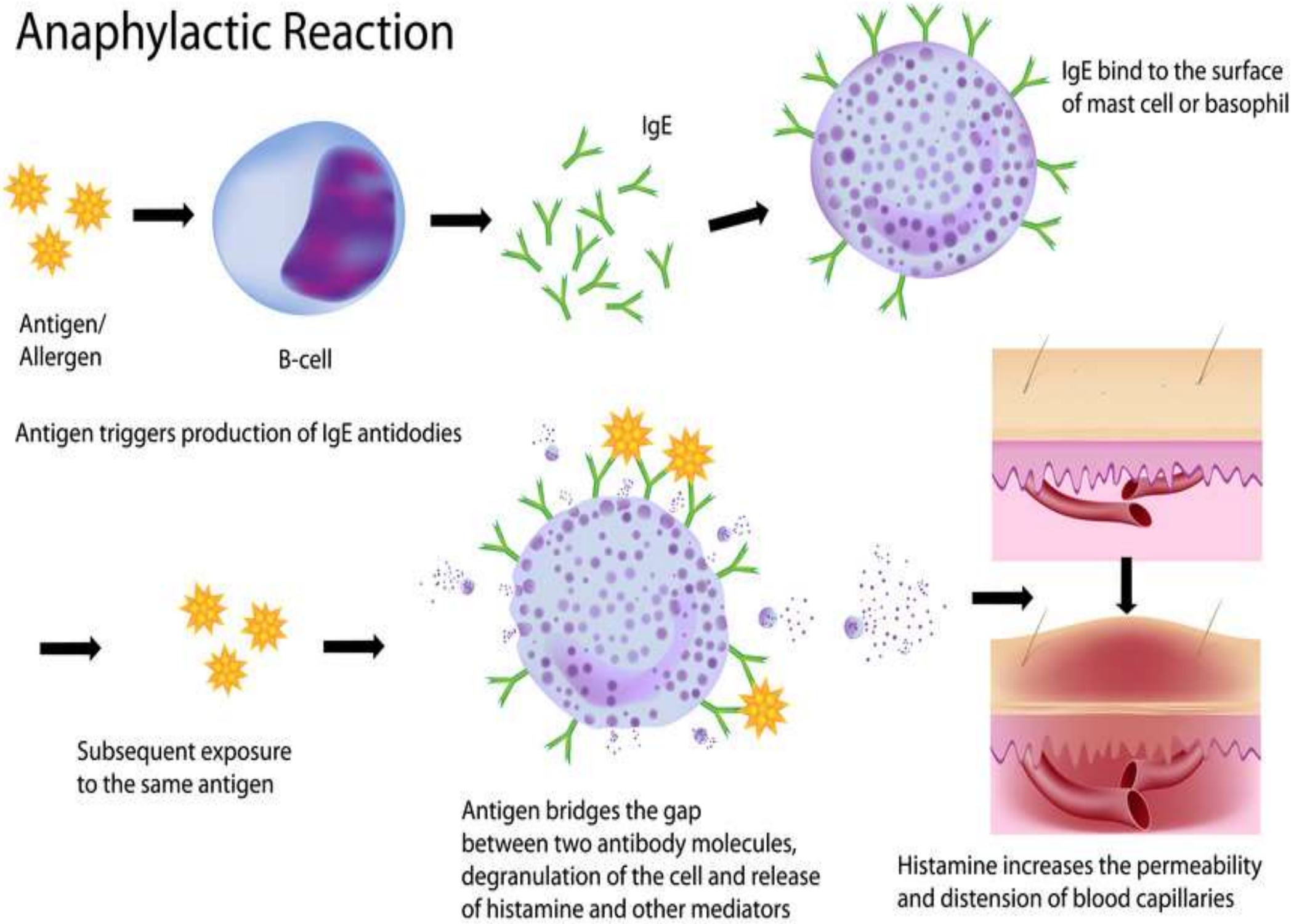
Fig. 1 Spectrum of food allergy disorders according to pathophysiology [6, 8, 10]

Pathogenesis

- **IgE Mediated:**

In susceptible individuals - food allergens penetrate mucosal barriers-cell-bound IgE antibodies- release mediators -vasodilation, smooth muscle contraction, mucus secretion(allergy)-released cytokines attract and activate eosinophils and lymphocytes-leading to prolonged inflammation.

Anaphylactic Reaction



Pathophysiology

- With exception of a carbohydrate known as galactose-alpha-١’٣-galactose

- A protein component leads to sensitization and allergy
- Resistance to denaturation by heat or acid and, therefore,
- Can remain intact even after processing, storage, cooking and digestion

- Allergies to additives and preservatives are uncommon.

Clinical manifestations

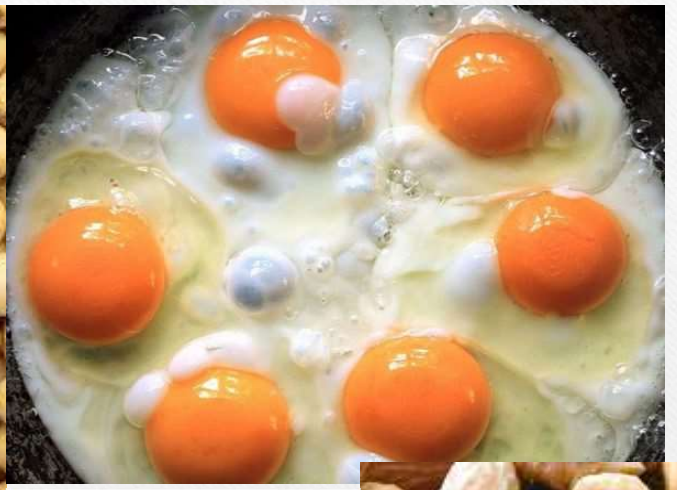
- Broad range of signs and symptoms that may involve any body system, including
- Skin
- GI
- Respiratory tracts
- Cardiovascular system

- *Food allergy is not felt to play a role in chronic respiratory symptoms.*

- Cutaneous: urticaria, angioedema, morbilliform rashes, flushing, contact urticarial
- Gastrointestinal: oral allergy syndrome, gastrointestinal anaphylaxis
- Respiratory: acute rhinoconjunctivitis, bronchospasm, sneezing, dyspnea, wheezing
- Cardiovascular system (dysrhythmias, hypotension, loss of consciousness

Table 1 Prevalence (self-reported, unadjusted) estimates for probable food allergy in Canada [2]

Food allergen	Prevalence (%)	
	Children	Adults
Peanut	2.2	0.6
Tree nuts	1.5	1.0
Fish	0.9	0.5
Shellfish	0.8	1.6
Sesame	0.1	0.2
Milk	0.2	0.2
Egg	1.0	0.5
Wheat	0.2	0.2
Soy	0.1	0.1



- Although food allergy can arise to any food, Health Canada society has identified the following ١٠ priority allergens:

- Cow's milk
- Egg
- Peanut
- Tree nuts
- Fish/shellfish
- Wheat
- Sesame
- Soy
- Food additive (mustard sulphites)

Oral Allergy Syndrome

- Also known Pollen- food syndrome

- localized IgE-mediated reaction
- Tingling and itching of the mouth and pharynx.
- Certain fresh fruits and vegetables
- Cross reactivity between IgE Ab to certain pollens with proteins in some fresh fruits and vegetables .
- Ragweed allergy (ابروسيا)------- bananas or melons,
- Birch pollen allergy(غان) ------ raw carrots, celery or apple.

Fortunately, these proteins are heat labile, enabling to eat these foods when cooked.

Allergy skin tests

- Negative to commercial food extracts but
- Positive to the fresh or frozen food

- Progression to systemic symptoms is rare

  but may occur in a few patients

Urticara & Angioedema

Anaphylaxis

- The most severe reaction
- Defined as a serious allergic reaction that is rapid in onset and may cause death.

Table 4 Clinical criteria for diagnosing anaphylaxis [21–23]

Anaphylaxis is highly likely when any 1 of the following 3 criteria is fulfilled following exposure to an allergen
1. **Acute onset of an illness** (minutes to several hours) **with involvement of the skin, mucosal tissue, or both** (e.g., generalized hives, pruritus or flushing, swollen lips-tongue-uvula) **and at least 1 of the following**: a. **Respiratory compromise** (e.g. dyspnea, wheeze, bronchospasm, stridor, reduced PEF, hypoxemia) b. **Reduced BP** or associated symptoms of end-organ dysfunction (e.g. hypotonia [collapse], syncope, incontinence)

- Cont.

- Signs and symptoms usually develop within minutes to ٢ h after food exposure.

- Reactions can be highly unpredictable
- Can vary from person to person,

- Even from attack to attack in the same person.

- Most common foods that cause anaphylaxis:

Peanuts, tree nuts, shellfish, fish, CM, eggs

but any food can trigger an allergic reaction

Note

- Patients should avoid the food in question until assessment.

- Epinephrine auto-injector (EAI) should be prescribed, even if the diagnosis is uncertain

Treatment

- Second-line therapies
- Inhaled beta-٢ agonists,
- H١ and H٢ receptor antagonists
- Corticosteroids

may play a role in resolving respiratory and cutaneous signs and symptoms.

- *Biphasic reactions may occur during the resolution phase of symptoms and, thus, all patients should be observed for a minimum of ٤ h to ٦ h before discharge from hospital.*

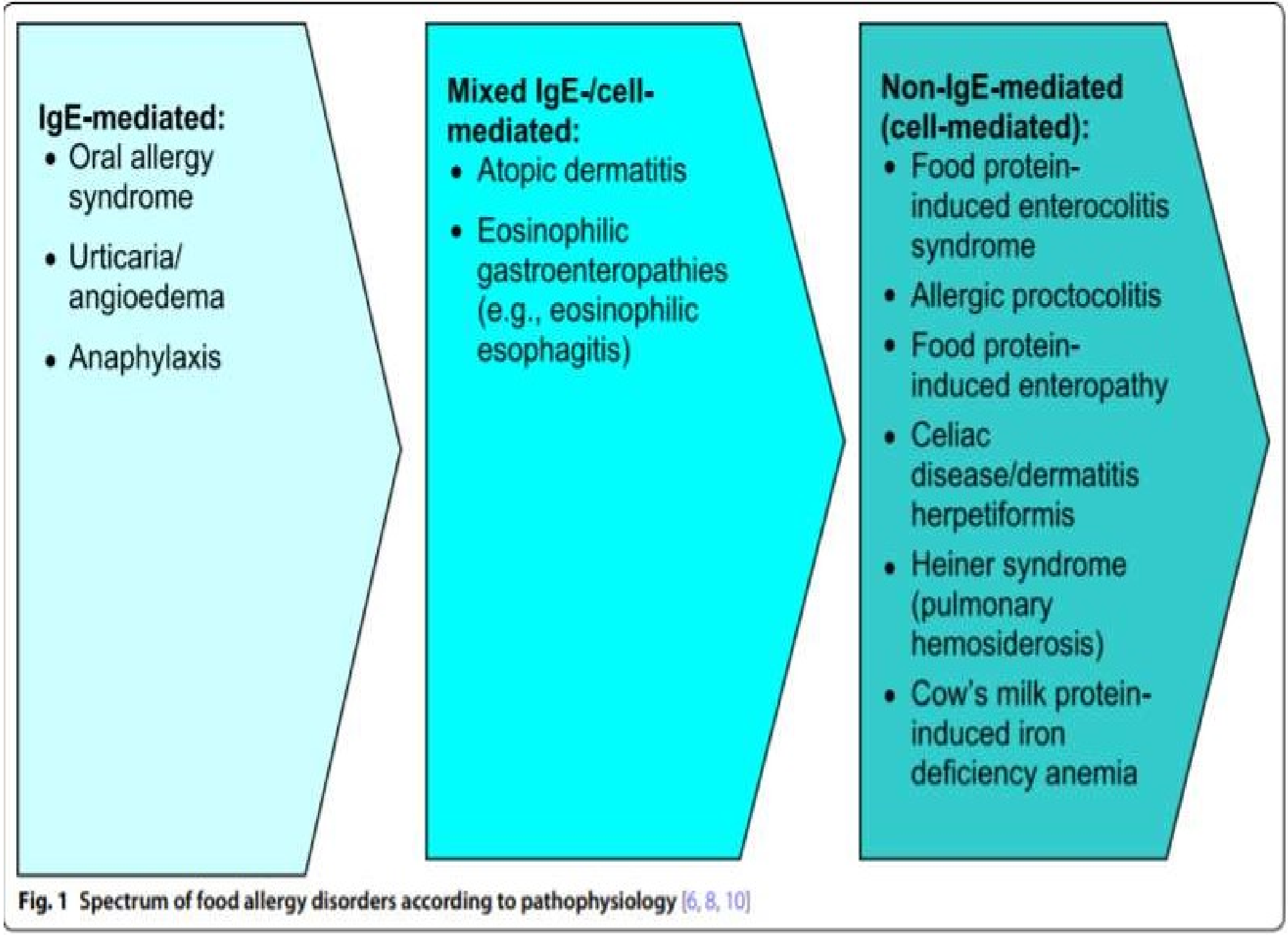


Fig. 1 Spectrum of food allergy disorders according to pathophysiology [6, 8, 10]

Food protein–induced enterocolitis syndrome (FPIES)

- Non–IgE-mediated gut reaction to ingested food(s)
- Severe reaction with vomiting, diarrhea
- Can be confused with AGE
- Dehydration, lethargy, shock, bloody stool, anemia, hypoalbuminemia, transient methemoglobinemia

cont,

- onset between ١ and ٦ hours after ingestion of food
- Milk, soy, rice, wheat, egg, chicken, turkey, fish, pea
- Skin prick and RAST are not indicated
- Atopy patch test are usefull confirmed with oral food challenge (must be supervised)
- usually resolves by age ٣-٥ yr

Food protein–induced allergic proctocolitis (FPIAP), Eosinophilic proctocolitis (EoP)

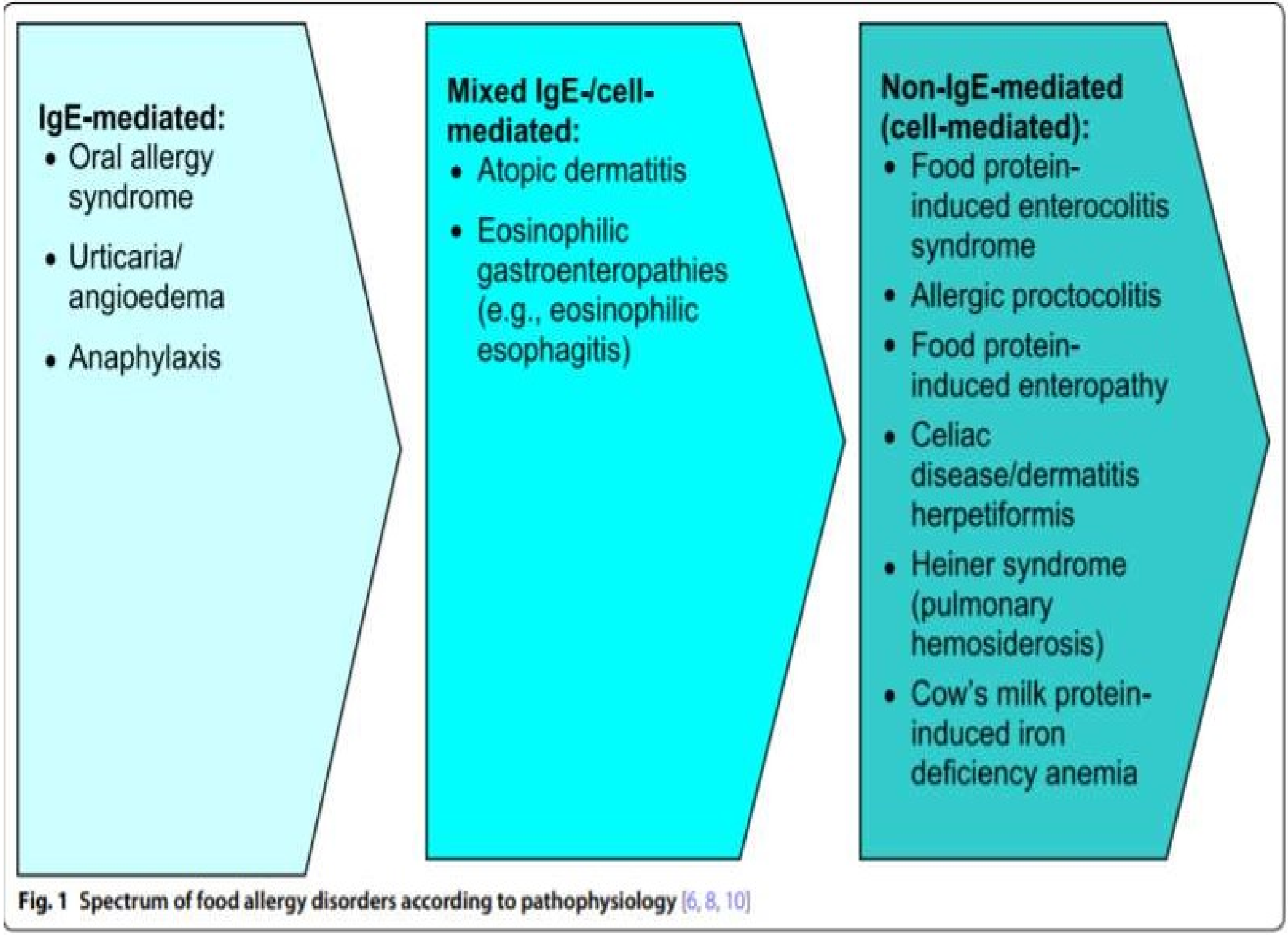
- Rectal bleeding, generally in children younger than ٢ months
- A bimodal age group: up to ٦٠ days and adolescence and early adulthood.
- Cow's milk, soy, egg, corn, chocolate
- Significant cross-reactivity between soy and milk proteins, (١٥%-٥٠%)

cont,

- Diagnosis is clinical; Blood-streaked stools, in a well baby, mild diarrhea
- Rarely anemia or mild FTT
- Sigmoidoscopy: erythema, friability, or frank ulceration and Increased eosinophils in focal aggregates within the lamina propria, preserved crypt architecture
- hydrolysate; resume/continue breastfeeding on maternal antigen restricted diet
- Reintroduction of the food at home in ٩-١٢ mo

FOOD PROTEIN–INDUCED ENTEROPATHY (FPE)

- Often manifests in the ١st several mo of life
- Protracted diarrhea, often with steatorrhea and poor weight gain, vomiting in up to ٦٥% of cases, FTT, abdominal distention, early satiety, malabsorption. Anemia, edema, and hypoproteinemia occur occasionally
- Most common cause: **Cow's milk** in young infants, but soy, egg, wheat, rice, chicken, and fish in older children
- Treatment is Protein elimination
- Most cases resolve in ٢-٣ yr, reintroduce in home gradually advancing



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EOSINOPHILIC GASTROENTEROPATHIES

- Infiltration of at least one layer of the gastrointestinal tract with eosinophils, in the absence of other known causes for eosinophilia (parasite, drug reactions)
- Peripheral eosinophilia (not required for diagnosis) a frequent finding
- Arise from the interaction of genetic and environmental factors
- High incidence of family and Personal history of atopy

cont,

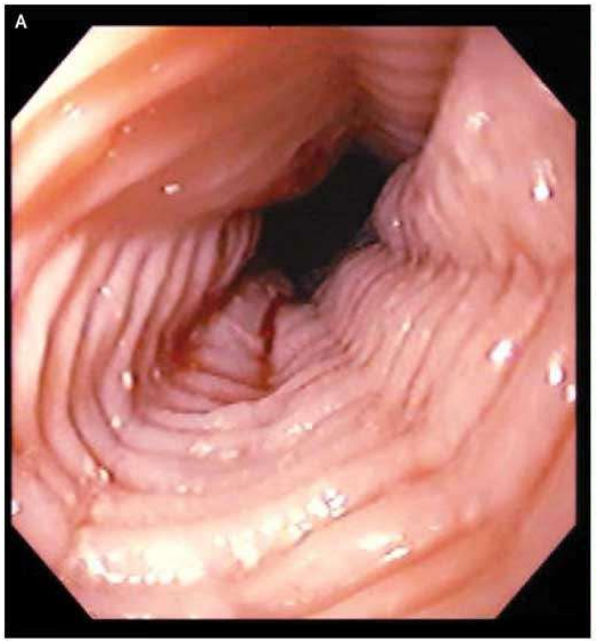
- Up to ١٠% positive history in an immediate family member
- Infant to adolescent
- Low incidence of anaphylaxis
- Intermediate between pure IgE-mediated allergy and cellular-mediated hypersensitivity disorders.

EOSINOPHILIC ESOPHAGITIS (EoE)

- Esophageal dysfunction and histologically by eosinophil-predominant inflammation
- Rapid resolution of the symptoms is not achived by elimination diet
- Symptoms do not always occur immediately after reintroduction of the foods
- Aeroallergens may contribute to the development of EoE
- Antibiotic exposure in infancy conferred a ۶-fold increased risk of EoE (other factors: C/S, preterm birth, and formula exposure)
- there may be a genetic predisposition to the disease (familial clustering)

cont,

- Maybe a manifestation of atopic disease like asthma
- male-to female ratio of about ٣:١
- Prevalence of ٥٠ in ١٠٠٠٠٠ but ٣/٦% in aerodigestive referral center
- Vomiting, regurgitation, nausea, epigastric or chest pain, water brash, globus, and decreased appetite(Less common symptoms: growth failure and hematemesis)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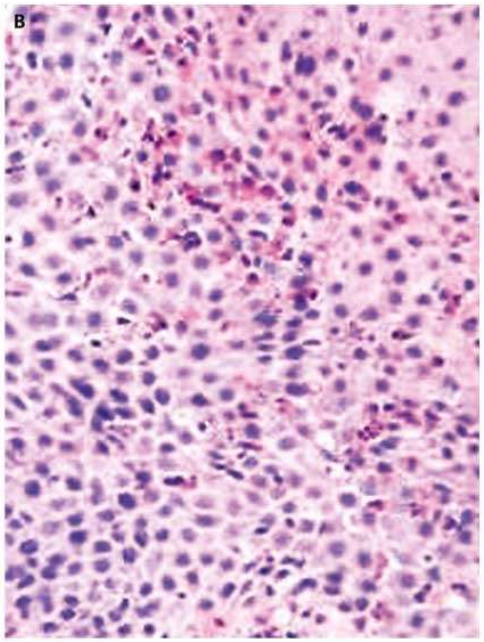
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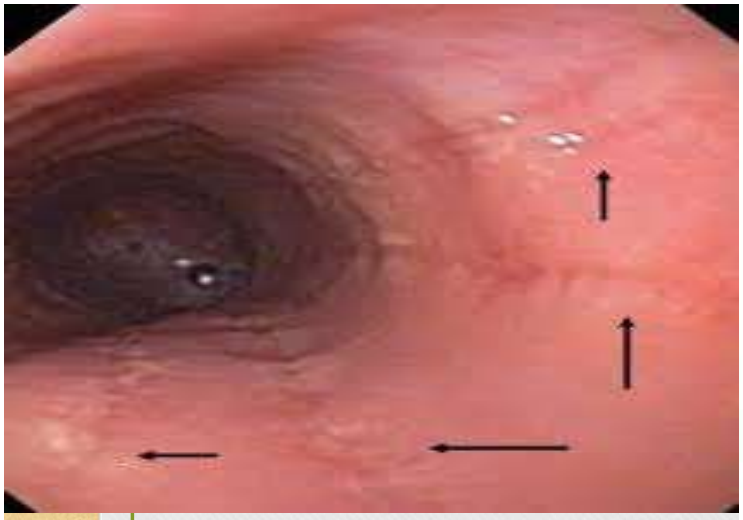

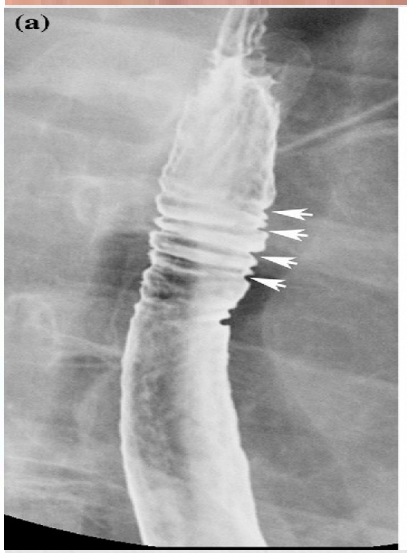
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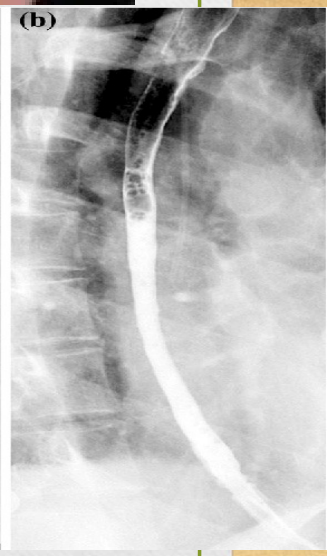
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- Trial elimination of allergens or elemental diet and clinical+histological monitoring
- Systemic corticosteroid or aerosolized fluticasone or liquid budesonide
- Biologic agent anti IL-۵(reslizumab)

EOSINOPHILIC GASTROENTERITIS

- A constellation of symptoms attributable to the gastrointestinal tract with pathologic infiltration by eosinophils

- Eo gastritis, Eo gastroenteritis, Eo enterocolitis

Characteristics of Eosinophilic Gastroenteritis

- Clinical characteristics

Nausea, vomiting, regurgitation

Severe abdominal pain

Diarrhea, protein-losing enteropathy

Gastrointestinal bleeding

Ascites

Intestinal obstruction

- >٩٥%, gastric antrum involved
- Peripheral eosinophilia (>٥٠%)
- Associated allergies, eczema, asthma, rhinitis, atopy
- GOO in infants, acute abdomen, bowel perforation

Treatment

- Elimination of pathogenic foods
- Elemental diet
- Corticosteroids (systemic)
- Immunomodulators
- Oral cromolyn sodium
- Montelukast
- Suplatast tosilate (TH۲ cytokine inhibitor)

OTHER MANIFESTATIONS OF GASTROINTESTINAL ALLERGY

- Gastroesophageal Reflux
- Infantile Colic
- Diarrhea
- Constipation

Natural history of food allergy

Varies by type of food allergen.

CM and egg allergy can present in the 1st year of life, and although some children may outgrow these allergies by early school age, others may not develop tolerance until their teenage years.

peanut, tree nuts, fish, and shellfish allergy are generally lifelong,

- Peanut and tree nuts are responsible for the most serious allergic reactions and food-allergy related fatalities


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