



Common Food Allergy in Children & Adults

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Food Allergy

- *Food allergy is defined as an adverse health effect arising from a specific immune response occurs on exposure to a given food*

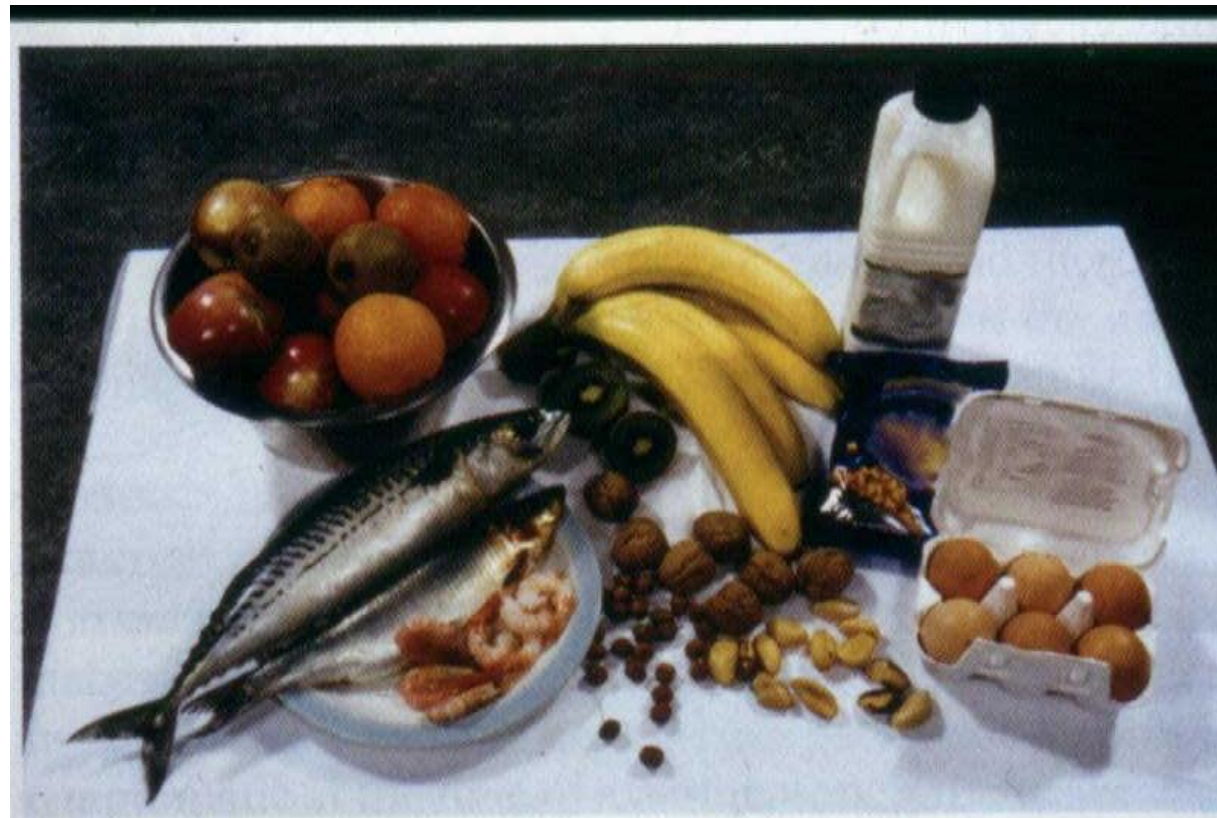
Food Allergy

Food intolerance:

most adverse reaction to food

- ***toxic contamination(histamine in fish- toxin of salmonella***
 - ***pharmacologic (coffin, coffee –Tyramine, aged cheese)***
 - ***metabolic(lactase deficiency)***
- they are present as food allergy, can not be reproduced***

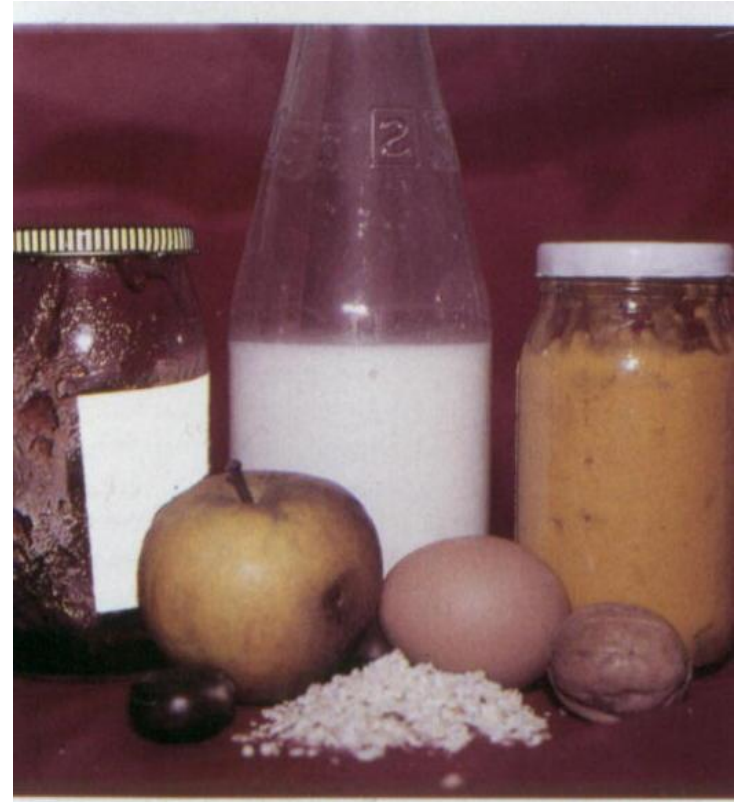
- ***90% of IgE-mediated food allergies in childhood are caused by eight foods: cows milk, hens egg, soy, peanuts, tree nuts (and seeds), wheat, fish and shellfish.***



• *Which food allergy usually doesn't improve during childhood?*

- *A- fish*
- *B- milk*
- *C- egg*
- *D- soy*

Children often develop tolerance to cows milk, egg, soy and wheat by school age, whereas allergies to nuts , fish and shellfish are more likely to be lifelong



Food Allergy

- *Prevalence of food allergy in American children 18 percent in 2007*
- *Eosinophilic esophagitis has increased in children*
- *food allergy is the most common cause of anaphylaxis in OPD*

Food Allergy

- *More than 90% of FA in children: cow's milk, egg soy, wheat*
- *nuts, fish and shellfish in adult*
- *High protein content introduced at early age*
- *Dietary habits: sesame in East, buckwheat in Japan ,*
- *mustard in France*
- *Most FA **improve**: cow's milk, egg , soya, wheat*
- *Peanut and tree nut and seafood tend to persist to adulthood*

Food Allergy & prevalence

- *In a study in America self-reported food allergy in children ,: 8%*
- *the most prevalent food allergy were peanut ,cow's milk ,shellfish and tree nut in Euro*
- *in a meta-analysis FA in 6%*
- *FA increase 18% between 1997 to 2007, Maybe due to increase in diagnosis*

Food Allergy prevalence

- ***Prevalence 0.5- 2.5% newborn : CMA in first y of life ; 60% IgE – mediated***
- ***Egg allergy in 1.6% of young children in UK & USA , 8.9% in Australia***
- ***In infants : CMA non Ig E–mediated improve in 3rd year;***
- ***CMA & egg IE-mediated allergy : 10-25 % retain their sensitivity to second decade, 50% develop FA to other food***

Changes in prevalence of food allergy

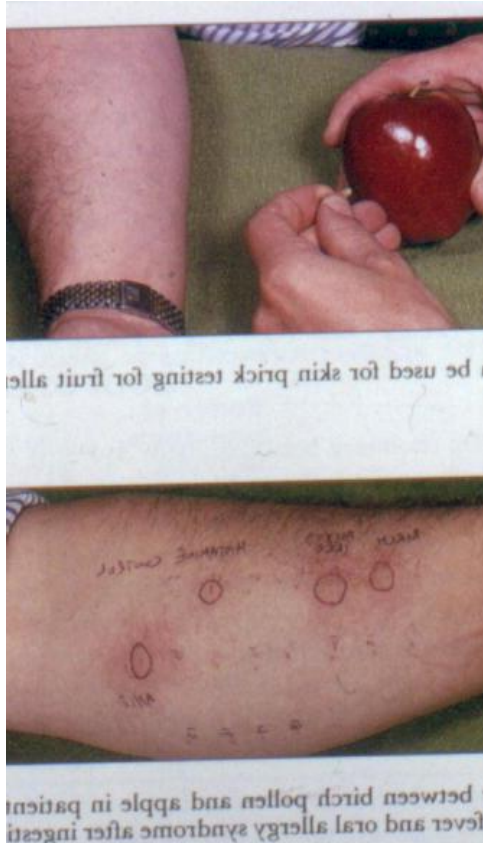
- ***Tree nut, peanut allergy : 2-3 fold increase in west, in children during last 10-20 y,***
- ***Food anaphylaxis increases 70-100% (125%)***
- ***ER visit for anaphylaxis increase, greater increase in 5-17 y-o***

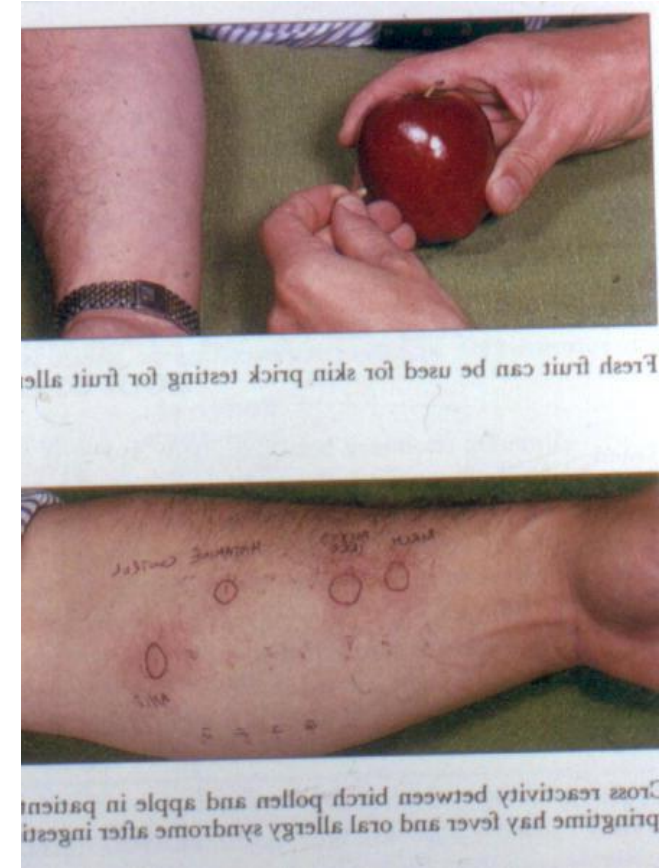


Food Allergy in Children

- ***Food additive allergy : 0.5-1%(in atopy- & in FA)***
- ***35% of children with mod. to sever AD : IgE mediated FA***
- ***6% of asthmatic children : food induced wheeze***
- ***Children with E esophagitis : symptoms improve after elimination diet***

Food Allergy in Adult

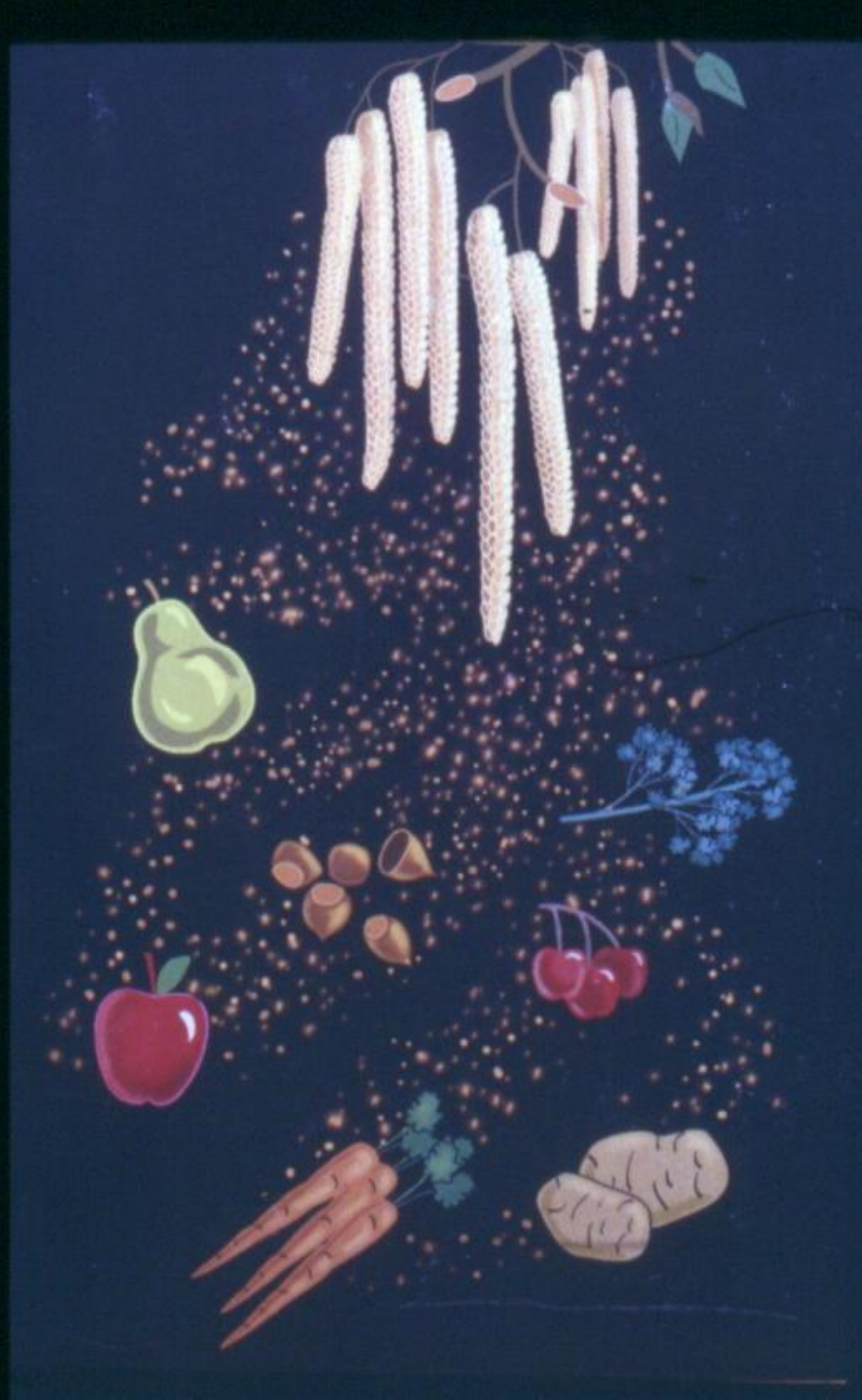
- **FA in adult is less common , peanut & tree nut : 1.2% + sea food 2.3% = 3.5-4%,**
 - **overall *pollen-food allergy* : 16.7% in young adult**
 - **Pollen related FA : higher prevalence, allergy to pollen :**
 - 74% oral symptoms to pollen associated foods (raw food- vegetables...)**
- 



Oral Allergy Syndrome

- ***Angioedema ,itching,
lips, throat ,tongue***
- ***Fruit ,vegetables***
- ***Transient***
- ***Allergic rhinitis***





Genetic & Environmental

- ***Genetic & histone related protein active in epigenetic regulation of gene expression***
- ***Peanut allergy in 64% of monozygotic twin***
- ***Hygiene hypothesis: early life exposure to infection ; tolerance***
- ***C/S***
- ***Timing of infant diet***
- ***Integrity of skin barrier***

- *IgE mediated FA in Europe: 11-29% in 7-10 y-o and 7-24% in adult*
- *Geographic variation: environmental factor*

Protective effect of environment on Food Allergy:

- *young mother – no of pregnancy-longer pregnancy-*
- *living farm-*
- *more sibling- older sibling-*
- *day care & pet before 2 y-0-*
- *Younger infant formula introduced, less likely FA*
- *Younger infant solid food introduced, less likely FA*
- *Breast fed more than 6 m-o- ?, but duration and the time of breast fed : no prevention of food allergy*

- *Environmental factor increase Food Allergy*
- *Vit D deficiency-*
- *late introduction of food-*
- *antacid in adult-*
- *prematurity - LBwt-*
- *atopy-*
- *parental FA-*
- *inhalant sensitization-*
- *infant formula(replace or complementary) especially hypoallergenic formula*

Food allergen

- ***The top 20 protein families : 80% FA***
- ***Class I : water soluble glycoprotein, stable with heat , acid , enzyme; allergic sensitization in GI or via inflamed skin***
- ***Class II : after sensitization to inhalant allergen***



Cow's Milk Allergy

- ***The first protein***
- ***The most common FA***
- ***Casein : 76- 86% of milk , 4 component***
- ***Whey : α -lactoglobulin,
 β -lactoglobulin, bovine Ig- Bovine alb.***
- ***Lactoferrin- transferrin- lipase- esterase***
- ***Casein is more potent : Ab response***
- ***But whey is stronger in allergic RX (rapidly absorbed)***

Cow's Milk Allergy

- ***In immunoblotting : cross Rx among CM- goat-sheep: homology***
- ***90% CMA , react to goat's milk***
- ***10% milk allergy , react to beef***
- ***Extensive heating (95c/20 min) , destroy whey protein***
- ***Pasteurization may increase allergenicity of cow's milk(β -lactoglobulin)***



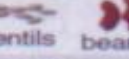
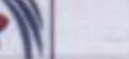








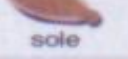



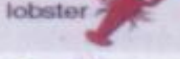

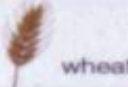

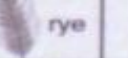





































If Allergic to:	Risk of Reaction to at Least One:	Risk:
A legume* peanut 	Other legumes peas  lentils  beans 	5% 
A tree nut walnut 	Other tree nuts brazil  cashew  hazelnut 	37% 
A fish* salmon 	Other fish swordfish  sole 	50% 
A shellfish shrimp 	Other shellfish crab  lobster 	75% 
A grain* wheat 	Other grains barley  rye 	20% 
Cow's milk* 	Beef hamburger 	10% 
Cow's milk* 	Goat's milk goat 	92% 
Cow's milk* 	Mare's milk horse 	4% 
Pollen birch  ragweed 	Fruits/vegetables apple  peach  honeydew 	55% 
Peach* 	Other Rosaceae plum  pear  apple  cherry 	55% 
Melon* cantaloupe 	Other fruits watermelon  banana  avocado 	92% 
Latex* latex glove 	Fruits kiwi  banana  avocado 	35% 
Fruits kiwi  avocado  banana 	Latex latex glove 	11% 

FIG 1. Approximate rate of clinical reactivity to at least 1 other related food. The probability of reacting to related foods varies, depending on numerous factors (see text). *Data derived from studies with DBPCFCs.

Cow's milk allergy

- *75% of CM allergy tolerate baked milk*
- *Rx to baked milk : more sever form(anaphylaxis) & more prolonged*
- *Baked milk : accelerated tolerance to unheated milk*

Cow's Milk Allergy



- *75% milk allergy : tolerate baked milk*
- *Rx to baked milk: more severe form (anaphylaxis) & more prolonged*

Baked milk : accelerate tolerance to unheated milk

Chicken Egg Allergy

- *The most common IgE-mediated FA in children*
- *White is more allergenic , ; glycoprotein-ovomucoid - ovalbumin- ovotransferrin*
- *70% of egg allergy : tolerate baked egg (cake)*
- *Baked with wheat gluten: form high molecular complexes : water insoluble*

Nut allergy

- ***Tree nut : 1.2% of US population***
- ***almond 0.7%- walnut 0.6%-
hazelnut 0.6%***
- ***Skin test Rx among tree nut but allergy to one
nut can tolerate others***
- ***30% of peanut allergy Rx to at least one nut***



Fish allergy

- *In adult and children*
- *Parvalbumin from white meat*
- *Rx to 1 to 3 types of fishes*
- *Tolerate canned fish*
- *Allergy to airborne during cooking*
- *Sea factory : occupational asthma*
- *Raw fish: allergy to fish parasite: Anisukis simplex*



- *Which one is the most common presentation of food allergy?*

- *A- asthma*

- *B- Urticaria*

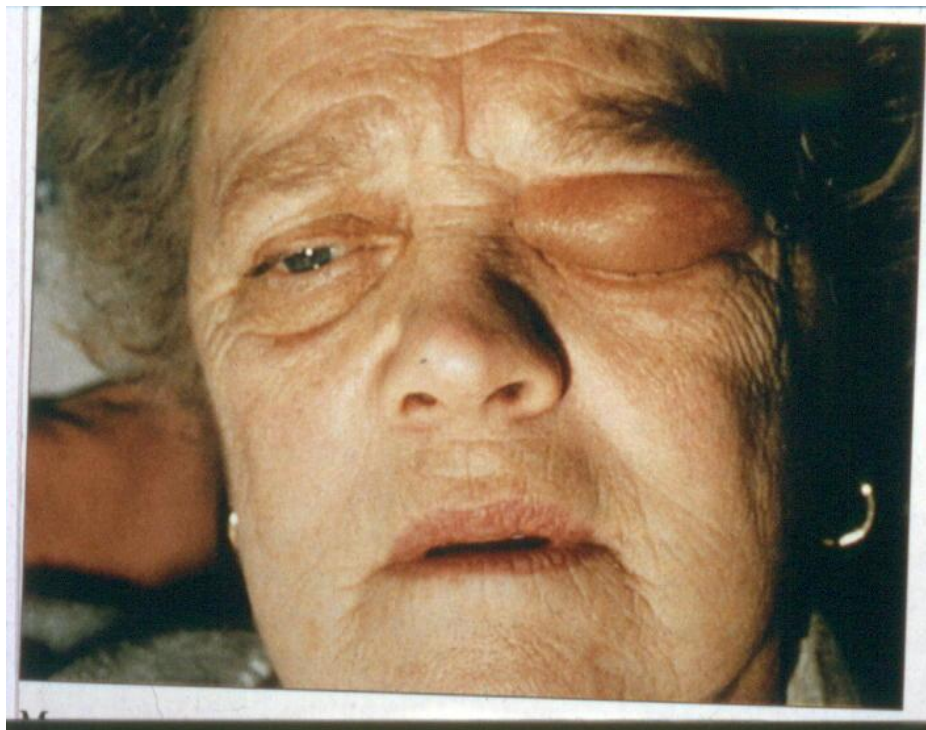
- *C- anaphylaxis*

- *D- abdominal pain*

Cutaneous Food Allergy ,IgE mediated

- *Urticaria & angioedema : the most common acute symptom*
- *Cause & effect is obvious : appear during min*
- *Adult : fish – tree nut*
- *Children: egg – milk – nut*
- *Contact with food ; prevalence?*
- *Chronic Urticaria : 2-4% FA*





Cutaneous Food Allergy

Mixed IgE –non IgE mediated

- *Atopic Dermatitis* 90% in young :1 y-o(typical distribution- itching- relapsing) with asthma or AR
- In children 35-40% with mod to sever AD : FA, elimination of that diet : improvement
- In a series : AD& FA: 1/3 outgrown in 2-3 years, tolerance to soy was common, to peanut was rare
- Skin prick test may become +ve , but serum specific IgE dropped





Cutaneous Food Allergy non IgE mediated

- ***Food induced contact dermatitis: among food handler(raw fish, meat, egg)***
- ***Dermatitis Herpetiformis: chronic blistering skin disorder, with gluten enteropathy***
sever itchy, vesico-popular, symmetrical: extensor-buttock



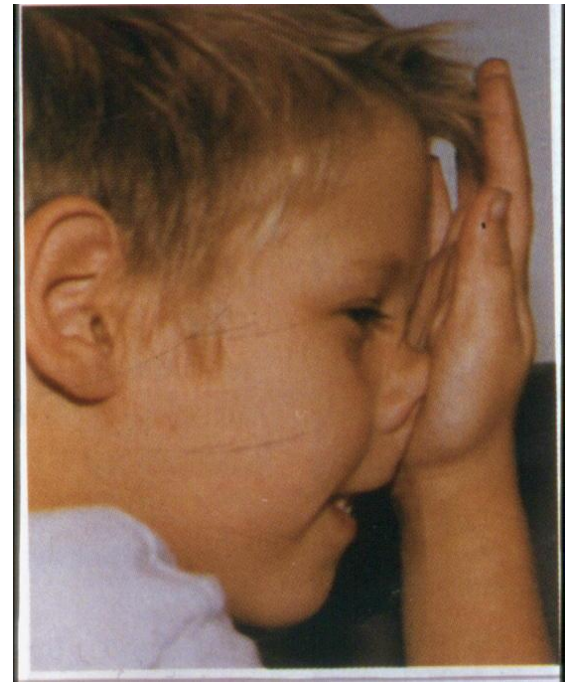
Respiratory Food Allergy

- ***Acute form: IgE- mediated***
- ***Chronic form: mix IgE & non-IgE- mediated***
- ***Upper & lower respiratory tract***

Respiratory Food Allergy

Rhinoconjunctivitis

- ***,alone is not common in FA***
- ***Minutes to 2 hrs after ingestion(erythema- itching-tearing)***
- ***+ AR sign***
- ***In DBPCFCT : 16% AR sign, but in infants 0.2%***



Respiratory Food Allergy asthma

- ***Isolated **wheeze** is uncommon in FA***
- ***In children 6-8.5% : food induced wheeze (to 25% in another study)***
- ***Study: In asthma + AD : 15% FA***
- ***Airborne food allergy (vapor- steam) from cooking (fish-egg..)induce asthma in susceptible pts***
- ***Asthmatic children with food allergy : more sever asthma***

در کدامیک شانس آلرژی غذایی کمتر وجود دارد؟

1- آسم

2- کهیر حاد

3- کهیر مزمن

4- رینیت آلرژیک

Respiratory Food Allergy non-IgE mediated

- ***Food induced pulmonary hemosiderosis(Heiner Syndrome)***
- ***Rare***
- ***Recurrent pneumonia***
- ***Pulmonary hemorrhage***
- ***Hemosiderosis***
- ***GI blood loss***
- ***Iron deficiency Anemia***
- ***FTT***

Respiratory Food Allergy non-IgE mediated

- ***Hemosiderin laden macrophages in GI aspirate or lung bx***
- ***Non IgE mediated response to milk (Egg-buckwheat-..)***
- ***Eosinophil- serum precipitant***



Anaphylaxis & Food Allergy

- *1/3 of causes of anaphylaxis in ER*
- *GI- Resp_ Skin- CVS*
- *Study : 12 fatal and fear fatal anaphylaxis : all had resp symptom*
- *¼ remain symptomatic till 2-3 days*
- *FA with sever Rx in : asthma- hx of sever Rx- delay treatment- denial*
- *In US : 85% fatalities (peanut- tree nut)*
- *Bothe sexes*
- *Adolescence- adult*

Food dependent exercise induced anaphylaxis

- *Exercise –induced anaphylaxis: 30-50% food trigger*
- *Exercise within 2-4 hrs of ingestion the food*
- *Can tolerate that food if no exercise*
- *Usually have asthma or atopy*
- *Hx of Rx to that food when were younger*
- *More female*
- *Late teen to 30*
- *Mechanism?*
- *Wheat, fruit, milk, celery ,*
- *Dx: exercise after eating within 1-2 hrs*





Thanks!