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## Food Allergen: A Growing Problem

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### Review Article

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#### ABSTRACT

Food allergy is an increasing problem in the society nowadays. It can be developed by many of the complex host factors and properties of food. Allergen can be any protein in the food which act as antigen or foreign particle to the body and trigger the defence mechanism of immune system. Its symptoms can be vary from minor itching to life threatening conditions such as anaphylaxis. So, it is very important to know the causative allergen in the diet as the only and best way to neglect the allergic reaction is to remove that food completely from the diet. But before avoiding the food from diet, it is very necessary to have the right diagnose for the allergen as unnecessary removal of food from diet can leads to bad health effects.

#### INTRODUCTION

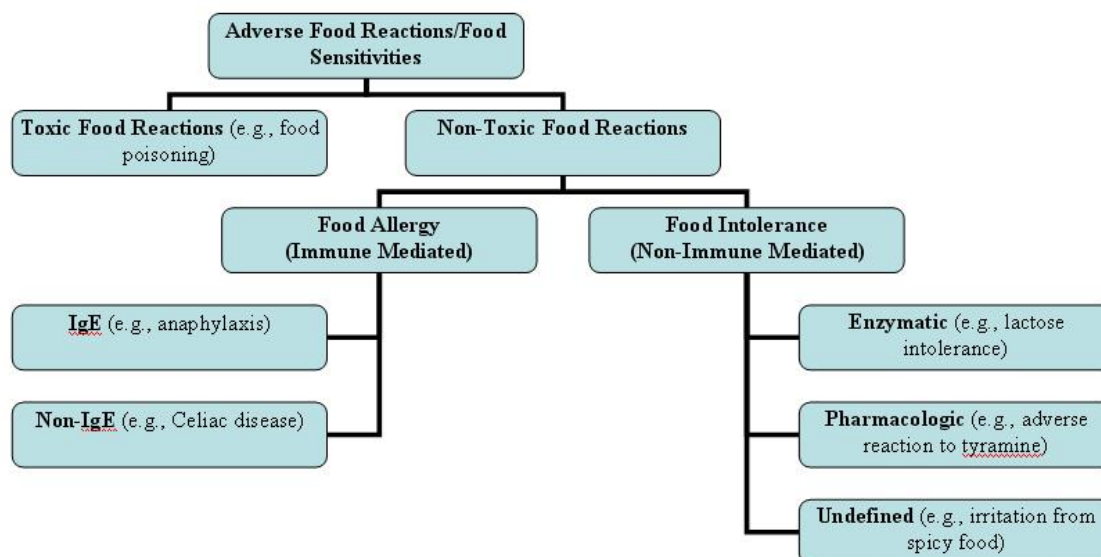
Any substance which is harmless in nature but is capable of inducing an allergic reaction in some hypersensitive person is known as allergen. Food allergens are mostly proteins or the derivatives of protein in food that cause some abnormal immune response or immediate allergic reaction in a susceptible person. The reaction occurs when the food allergen enters the body and immune system overreacts to it. Immune system of the body identifies it as a danger or foreign substance and triggers the protective response of the immune system [1]. An expert panel of the National Institute of Allergy and Infectious Diseases define food allergy as “an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food.”

There are around 120 foods that are described as food allergens but only limited number of those is considered as a concern to public health. 90% of the food allergies are due to response of Cereals containing gluten, Peanut, Tree nuts, Milk, Egg, Soy, Fish, Shellfish [2-4]. Other than these food celery, mustard, sesame seeds, sulphites, lupin, molluscs are known to be food allergen. A person can be allergic to any type of food substance or more than one type of food. Even a small amount of that food can trigger the immune system or an allergic reaction. Symptoms of food allergy may vary with person to person. It may include fainting, vertigo, dizziness, respiratory problems, swelling of various parts of the body such as the throat, tongue, face. The individuals may have tingling in the mouth, as well as hives [5].

Reaction of food allergy can be range from mild allergic reaction like skin rashes to Anaphylaxis, which is a serious, rapid and life threatening allergic reaction [6]. It may occur immediately after the exposure to some specific protein or can take some time from one minute to an hour [7-9]. The patient suffering from Anaphylaxis become agitated and complains of tachycardia and tachypnea [10]. Other than that tingling sensations, itchy and flushed skin, throbbing in the ears, coughing, sneezing, hives and swelling (angioedema) may occur [11,12]. IgE-mediated, cell-mediated or mixed IgE and cell mediated reaction can be there during allergies [13-15]. One of the key functions in anaphylaxis pathogenesis is held by platelet-activating factor (PAF, 1-o-alkyl-2-acetyl-sn-glycero-3-phosphocholine) [16]. It is observed that in some cases cow milk, ethylene oxide, persimmon fruit, avocado, banana,

chestnut, kiwi, tomato and citrus fruit like lemon are responsible to cause anaphylaxis [16,17]. Anaphylaxis requires immediate medical treatment which includes Intramuscular adrenaline, Epinephrine, Acetosalicylic Acid and other Non- Steroidal Anti-Inflammatory Drugs [18-22].

There are some adverse reactions of food which are not classified as food allergen it may include food intolerances secondary to metabolic disorders, reactions to toxic contaminants or pharmacologically active food components [23,24]. There are some conditions where the symptoms are like food allergy but it is just the related condition to food allergy like food intolerance which includes Eosinophilic Esophagitis, Food Protein-induced Enterocolitis Syndrome, Oral Allergy Syndrome, Food Intolerances, Lactose Intolerance, Celiac Disease [25-31]. Adverse food reactions can be classified as follow (Figure 1)



**Figure 1.** Classification of individualistic adverse reactions to foods [30].

### TESTS TO DIAGNOSE FOOD ALLERGY

It is very important to have right diagnosis of food reactions. There are some scientifically sound methods of testing to diagnose Food allergy or food intolerance.

#### Skin Test

The tests involve placing on the skin extracts of a particular food which is suspected as allergen. It is then pricked or scratched into the skin to look for a reaction of itching or swelling [31-33].

#### Food Elimination Diets

Suspect foods may be removed from the diet for around 2 weeks prior to a food challenge and symptoms of allergy are observed if symptoms disappear then the food is avoided in the diet.

#### RAST (Radio Allegro Sorbent) Tests

This is an identification test for allergy where blood sample of the patient is mixed with the food in a test tube. If the blood produces antibody which can be detected then the food is cause of allergy [34-38].

#### Double-Blind, Placebo-Controlled Food Challenge Tests (DBPCF)

In this allergy test, a suspected allergen is placed in a capsule or hidden in a food and is fed to the patient under strict clinical conditions and the adverse effect of the food is observed by the doctors specialized in allergies and food intolerance [39-44].

Food allergy is common in patients with severe persistent allergic asthma or atopic people to avoid the food allergy reaction, the only and best way is to avoid having allergenic foods. Read the labels of food before eating it to avoid food allergy [45-50]. The involvement of food allergy in patients with allergic disorders is complex, there should be proper diagnose of allergen as incorrect diagnosis of food allergy can lead to inappropriate treatment, with unnecessary restrictive diets and nutritional consequences [50-55]. It is reported that allergy can be heritated by the family. During the time of pregnancy, in order to prevent allergy in offspring, immunization with OVA reduced OVA-specific IgE and IgG1, and increased IgG2a and Th2 cytokine can be done. Allergen specific therapies have proven some advantages over allergen nonspecific therapies such as using probiotic, anti-IgE or gene silencing [55-60].

## CONCLUSION

Food allergy may be not the common problem but it can be the serious problem. People may take the unpleasant reaction of food they ate as a food allergy but it may be the intolerance to that food. Food intolerance is also an abnormal response of food. It may resemble to the food allergy. Food intolerance, is far more prevalent, occurs in a variety of diseases, and is triggered by several different mechanisms that are distinct from the immunological reaction responsible for food allergy. People with food allergy should identify and prevent the cause of allergy as the reaction may be mild but it can turn to be severe.

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