FOOD ALLERGY AND OUR GENES

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ABSTRACT

Allergy is a pathological condition which can hit anybody any time. What it means is that if a person is not allergic to a particular stuff till date from his birth, it does not assure that he won’t be allergic to it throughout his lifetime. Allergy can be spoken of as an immune response to certain things. Those things which trigger allergic response in an individual are termed as allergens. As a matter of fact, a person who has allergy is in general allergic to more than one thing. The responses do vary from person to person for same substances. A person may be absolutely normal to something while another man may be highly sensitive to that same stuff. That substance can be food and in that case the sensitive condition is termed as ‘food allergy’. Allergy, as light the word sounds may not be always that casual and easy to deal with. Allergic hypersensitivity can culminate to fatal consequences and may even lead to death. In this piece of review we have tried to get a glimpse of the old and new food allergens and their little details in a nutshell.

KEYWORDS: Allergy, allergens, food allergy, hypersensitivity, immune response.

Exposure to something may evoke series of immune responses in a person. As a result, that person gets hypersensitive to that particular thing and now he is called to be ‘allergic’ to it and that thing is an ‘allergen’ for him. Hypersensitivity to certain food stuffs is common in some people. Like we know well about allergy from brinjal, egg, prawn etc. But the new story is strange! It speaks of that a person may even get allergic to rice or roti or bread. Other foods which are known to evoke allergy are milk, fish (bass, flounder, cod etc., ), crustacean shellfish (e.g. crab, lobster, shrimp), tree nuts (e.g., almonds, walnuts, pecans), peanuts,
wheat, soybeans etc.\textsuperscript{[1]} This implies that it is not only protein rich foods those can cause allergic reactions in an individual, it can be anything.

In most cases, it is observed that allergic reactions occur within few seconds after being exposed to the allergen. Certain things may cause the reaction to begin after several hours of exposure to it. Such delayed allergic reactions are encountered primarily in case of food allergens. Food allergy is something very common and sad. Often people have to restrain from taking his/ her favorite food item as he suddenly develops allergy to it. In certain cases the reactions also may begin after twenty four hours of eating. Mostly the reactions are mild and discomfort lasts only for some time. But others may turn out to be severe and may be life threatening as well. The most fatal form of allergic reaction is called ‘anaphylaxis’ and the clinical situation is termed ‘anaphylactic shock’. First time exposure may cause mild allergic reactions. Repeated exposures intensify the severity of the reaction. Anaphylactic shock begins within few minutes of exposure to the allergen and if left without medical intervention may lead to death within fifteen to twenty minutes.\textsuperscript{[2]}

Now comes the question, what are the regulatory factors of such allergic reactions to certain foods? Why some people are deprived of enjoying foods containing eggs? They can’t even have cakes! Why suddenly one gets allergic to the stuff he has been consuming for years without any problem? The answer is that there is more than one factor responsible for and are in play in regulating allergic reactions in man. Those are genes and also our environmental factors. Strangely, people with a family history of allergies are more susceptible to allergic reactions. What it actually means is that allergic reactions are often observed commonly in people who have family history of having allergies. Thus this finding links genes-our hereditary units with the event of allergic reactions to certain foods. That does not anyhow rule out the possibility of environmental factors induced certain change in the genes which may cause allergic reaction in a person who doesn’t have any family history of allergy to that particular allergen. What basically happens during an allergy is that a person’s immune system starts reacting to a false alarm. The alarm is set in by the allergens. Those are type of antigens that trigger a vigorous immune reaction cascade. The immune system fights off a perceived threat incurred by the allergens. But those in reality would have been harmless to the body otherwise. The situation is a reaction to a false perception.\textsuperscript{[2]}

Among all types of allergies, food allergies are the most unpredictable and difficult ones to deal with. It’s not only because the particular food causing the allergic reaction is difficult to
sort out but also that accidental intake of that component in any type of food preparation may cause anaphylactic shock reaction in a person and can lead to death. So people with food allergy should be always alert and skeptic while eating out of routine. Blood test is considered as the initial step for diagnosing food allergy. The most significant step in dealing with food allergy is to pick the food from his menu to which he is allergic. Or better said to identify the food allergen. It may be one single component of a recipe and not the whole food item that can evoke allergic reaction. Or it may be a group of food components he is taking that stimulates his immune system.

The genes recognized so far, linked with allergy, more specifically, food allergy have been found to be ‘complex’. There is more than one gene responsible for the reactions and they all function in coordinated manner. In other words, food allergy, genetically inherited can be called as a ‘complex genetic disorder’. Those multiple genes responsible for food component induced allergic reactions, interact with each other, initiates and carries on the sequence of immune hyper-reactions following allergen exposure. In one aspect those allergic reactions are protective in nature. They are actually like a shield formed by our immune system to protect our body, with the slightest hint of foreign invasion. The allergens are recognized as foreign invaders by our immune system. Though this recognition occurs mistakably by our immune system due to errors coded by our faulty genes in response to environmental trigger’s. Some of those genes involved have protective values and some have its unpredictable and variable tendency of expression. It is essential to mention that those genes, all of them need stimulation by some appropriate environmental factors for their expression. They are regulated by the frequency and intensity of exposures to allergens. Recognition and understanding of the genes involved in such allergic reactions is essential. Analysis of genome, recognition of the interacting factors involved, identification of the structural deformities of the genes i.e., sequences of DNA, identification of regulatory factors and genetic interactions involved in such reactions, identification of potent anti-allergic drug targets, recognition of biomarkers involved in specific type of allergic reactions evoked by specific allergens are some among the steps scientists and researchers are trying to move on for opening a new gateway for getting some new potent drug for allergic diseases including food allergies. We look forward to future days when we can continue enjoying our favorite food without being scared of dieng of anaphylactic shock even though we are allergic to it by our genes.
REFERENCES