

Counter the Histamines

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Introduction

According to the Centres of Disease Control and Prevention more than 50 million Americans suffer from allergies annually. That is about 3 in every 20 people whose immune system goes into a state of alert or attack for common everyday elements. Nearly anything from the natural world can trigger it, all with a large range of effects on people ranging from sneezing to losing consciousness (Asthma and Allergy Foundation of America). These ailments can be lessened via a few methods such as antihistamines, decongestants, along with others, however these are all temporary fixes to the issue. A more permanent fix to allergies would be down the immunotherapy route.

The purpose of immunotherapy, or in this case allergy shots, is to expose the immune system to controlled levels of allergens. These injections are typically administered into muscle tissue near the shoulder of the patient weekly or alternating weeks. The objective is to force the body to build up an immunity to the allergens and introducing the immune system to increasing, yet controlled quantities.

Discussion

Why Not Over the Counter Medicine?

The primary difference between deciding if allergy shots are the correct route to take is determining if the problem is consistently throughout the year with inhibiting effects, or if it comes and goes with the seasons. It is recommended to ask a primary doctor or specialist, such as an allergist, to determine which route is most applicable for every individual.

If the situation is deemed to just need medicine, it is more probable that an antihistamine will be more effective. Over the counter antihistamine drugs such as Benadryl, Claritin, Zyrtec, etc. work by counteracting the histamines released by the immune system. Histamines are what activate nerves within the nose to release mucus and sneezing, along with other physical reactions to try to fight off the allergens (Medical News Today). Antihistamines share a similar protein to histamines which allows them to connect to the nerves within the body, blocking the

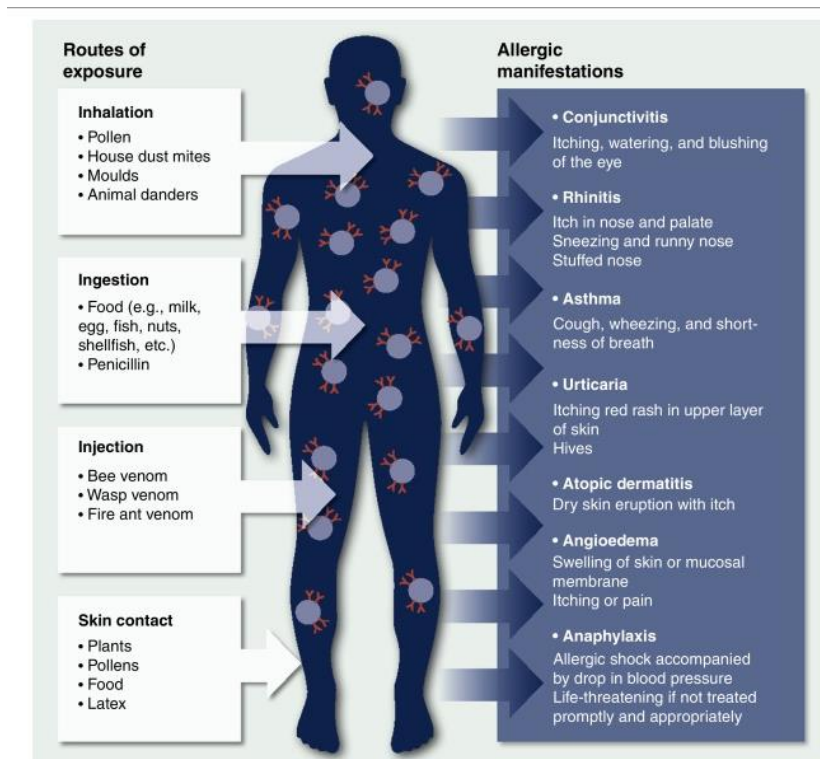
histamines from connecting. These are often most effective after a few days of continuous use each consecutive day having better results to a variable limit.

For people with mild, infrequent allergies, this solution is viable and effective, a tablet once or twice a day for a few days and the problem is solved. However, for people with more severe allergies, this approach will often not resolve much. Allergy shots, much like the antihistamine approach require a few consecutive doses before much of an effect is achieved. Unfortunately, the process takes a few months to get rolling, however, it can be supported via secondary medicine and can be taken in tandem to help assist during the initial stages of the injections. Where they begin to differ is the duration of the effects, a tablet will only last for about twelve to twenty-four hours at a time before a new dose is needed. The duration of the immunisation route is significantly longer depending on how many doses has been applied. After a few months, and eventually years, the need for other ailments becomes irrelevant, along with that, the immunisations will decrease further in frequency going to once a month until no longer needed. Beyond that point, most allergens will no longer pose a significant issue, however on days where allergen counts are higher than usual, additional supplements can be taken to assist in alleviating the immune system's response (The American Academy of Allergy, Asthma & Immunology).

Reactions to allergens

As seen in Figure 1 from *Drug Discovery Today*, there are multiple forms of allergens and different routes of exposure to allergens, some being external such as physical contact, and others occurring internally such as insect stings and bites, or ingestion or inhalation of substances. The reactions come in many forms as well; the lesser being sneezing and eyes watering to the more extreme like hives, swelling, or even anaphylaxis (Mayo Clinic).

In the event of anaphylaxis, an epinephrine pen, or EPI-pen, should be applied and 911 should be contacted.



Drug Discovery Today

Effects

Allergy shots are not completely risk free, as the process involves injecting varying levels of elements that the body is rejecting in the first place. Some possible effects would be:

- Common – in the injection area
 - Swelling
 - Irritation
- Uncommon – elsewhere on the body
 - Hives
 - Swelling
 - Difficulty breathing
- Dangerous
 - Anaphylaxis

Immediately after receiving the injection, the medical staff that helped administer it will supply an icepack to help with these effects during the waiting period following the injection. This period falls between a minimum thirty minutes to an hour depending on strength of the dose, and severity of allergies, this is to prevent any delayed effects and reactions (Mayo Clinic).

How Allergy Immunotherapy Works

Allergy Immunotherapy teaches the immune system how to react to molecules that pose no true threat to people. They allow white blood cells to release molecules to prevent the allergen from causing inflammation, effectively producing an effect like taking antihistamines, however done automatically and as needed (Drug Discovery Today). This works most like flu shots, where the patient is exposed to a bit of virus for the body's autoimmune system to learn how to combat it and therefore

gaining an immunity to it.

Figure 2 from Drug Discovery Today, shows how different cells within the immune system see and react to allergens as they enter the system.

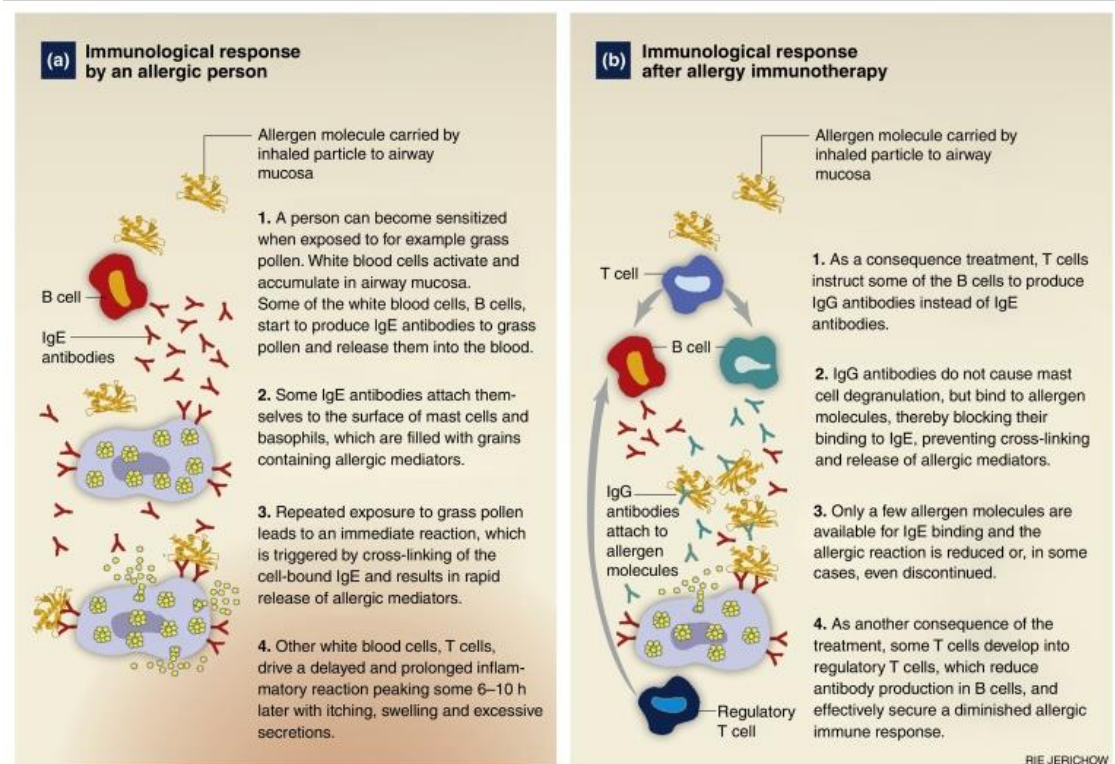


Figure 2: Immune reactions before and after immunotherapy

Conclusion

Immunology is a process where the body is introduced to controlled quantities of substances and sets the immune system to build a tolerance and learn to resist the foreign substances. Starting allergy shots will not change anything immediately, however, it will build up tolerance and a difference will be noticeable. After a few months into the procedure and significant upon completion of the first year. For cases with persistent, and severe allergies, immunisations help significantly and will ease up on how much medication would have to be taken regularly. The response becomes fully natural and automatic as the body now knows how to respond to common particles that should not warrant the immune system to go into alert mode.

Glossary

Antihistamine: any of various compounds that counteract histamine in the body and that are used for treating allergic reactions (such as hay fever) and cold symptoms

Anaphylaxis: A severe, potentially life-threatening allergic reaction. The reaction can occur within seconds or minutes of exposure to an allergen. Symptoms include a skin rash, nausea, vomiting, difficulty breathing, and shock.

Histamine: a compound $C_5H_9N_3$ especially of mammalian tissues that causes dilation of capillaries, contraction of smooth muscle, and stimulation of gastric acid secretion, that is released during allergic reactions, and that is formed by decarboxylation of histidine

Immunotherapy: treatment or prevention of disease (such as an autoimmune disorder, allergy, or cancer) that involves the stimulation, enhancement, suppression, or desensitization of the immune system

All definitions obtained from the Merriam-Webster Online Dictionary (www.merriam-webster.com/) or sources previously cited in this document.

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