



Allergies: When the Immune System Backfires

Video Transcript

Therapeutic approaches

[Andreas J. Bircher]: Three different options to treat allergic symptoms exist. The first option is elimination, meaning the avoidance of the allergen. The second option is pharmacotherapy, which refers to specific drugs that are supposed to block or inhibit mechanisms causing the allergic symptoms. The third option is immunotherapy, which aims at modulating the immune reaction.

Regarding the option of elimination, avoiding contact with an allergen may result in abrogation or complete absence of symptoms. Unfortunately, sometimes the source of an allergen cannot easily be recognised and avoided. A patient allergic to cats will have no symptoms unless he is exposed to cat allergens. However, only being exposed to a person carrying cat allergens on his clothes may be sufficient to trigger symptoms. Generally speaking, the more volatile the allergens are, the more difficult they are to avoid.

Regarding pharmacotherapy, several drug classes exist that are capable of reducing or abolishing allergic symptoms. They may block the effect of mediators, such as histamine or leukotrienes. Others interfere with different cells and reduce allergic inflammation. Antihistamines are available as tablets, as nasal spray, and as drops for oral use or eye drops. In patients with systemic symptoms, antihistamines are injected intravenously. This medication blocks the histamine receptor, thereby reducing the effects induced by histamine, including itch, redness, tears, mucosal secretions, and swelling. Regular use leads to the best results.

Currently, different corticosteroids are available to treat respiratory or skin allergies. They exist as spray for asthma and the nose, creams or ointments for the skin, tablets or as injectable solutions for severe allergic attacks. Due to their mechanism of action, the onset of effect takes some hours to a few days. The mainstream therapy used to treat acute asthma is the inhalation of betamimetics. They have a rapid effect on wheezing and dyspnea.

Longer acting betamimetics are often combined with corticosteroids for prevention of asthmatic symptoms. Leukotriene receptor antagonists block the effect of leukotriene at its receptor. This oral drug is also used to treat asthma and is mainly prescribed to children. Adrenaline is the drug of choice to be used for severe allergic reactions, such as anaphylaxis.

A new class of drugs, the biologics, has been introduced approximately 20 years ago. These are monoclonal antibodies, produced in cell cultures that can specifically bind to a target in the immune system. The biological antibody omalizumab, for example, binds to free circulating IgE antibodies and consequently reduces IgE mediated mast cell and basophil activation.

Other biologics bind to cytokines or immune cell receptors and block or reduce the activation of these cells. Allergen-specific immunotherapy, also known as allergen immunotherapy, desensitisation, or hypo-sensitization is an established therapy used to treat respiratory and venom allergies. Grass, birch pollen, and house dust mite allergies, as well as some animal dander allergies are candidates, where an immunotherapy is frequently envisioned.



The principle of an immunotherapy is to expose patients to increasing amounts of allergen in an attempt to dampen the immune system's allergic response. Various allergen products exist for injection or sublingual use. The first treatment effects are expected after three to six months. It is typically performed over a period of three to five years to reach long-term effects.

The therapy needs to be prescribed and supervised by an experienced physician. Successful therapy of allergic symptoms often requires the combination of all three approaches, avoidance, pharmacotherapy, and immunotherapy. Ideally, patients acquire tolerance to allergens through immunotherapy and can then reduce or stop the remaining treatment modalities..