SIXTH EXERCISE

ALLERGEN IMMUNOTHERAPY

DEFINITION

Specific allergen immunotherapy is the administration of increasing amounts of specific allergens to which the patient has type I immediate hypersensitivity. Allergy immunotherapy is the only disease-modifying treatment for allergic individuals. This treatment is indicated for the treatment of allergic rhinitis, allergic asthma, and hymenoptera hypersensitivity.

IMMUNE MECHANISMS

This treatment isbased on the administration of increasing doses of allergens to allergic patients to induce a state of unresponsiveness.

Probable pathophysiological mechanism includes the modulation of the allergen-specific immune response from a T helper 2 (Th2) responses towards a preferential Th1 responseand the induction of allergen-specific IgG antibodies that antagonize IgE-mediated effects.

In cases of allergic rhinitis humoral, cellular, and tissue level changes occur with allergen immunotherapy including large increases in antiallergen IgG4 antibodies, a decrease in the postseasonal rise of antiallergen IgE antibodies, reduced numbers of nasal mucosal mast cells and eosinophils, induction of Treg cells, and suppression of Th2 more than Th1 lymphocytes. **Allergen immunotherapy is the only treatment that can modify the immune response to allergens and alter the course of allergic diseases.**

PHARMACOLOGICAL EFFECTS

Standardized allergen extracts should be preferred for allergy diagnosis and therapy. Allergen extracts are a preparation of an allergen obtained by extraction of the active constituents from animal or vegetable substances. The quality of the allergen vaccine is critical for both diagnosis and treatment.

Standardized vaccines of known potency should be used. The standardization can be made in two ways: **Biologically** (the potency of the vaccine is compared to the cutaneous response obtained in a reference population) and **Immunologically** (the potency of the vaccine is based on RAST-inhibition experiments using standard pools of sera). Standardized allergen extracts should be preferred for allergy diagnosis and therapy.

Allergen immunotherapy should be based on allergen sensitization not on the disease.

INDICATIONS

Hymenoptera venom immunotherapy is the only effective preventive treatment for insect sting-induced anaphylaxis.

Allergic asthma and rhinoconjunctivitis – specific immunotherapy (SIT) reduces symptoms and/or medication needs. In some guidelines the indication for allergen immunotherapy for asthma and rhinitis has been separated. This separation is incorrect - respiratory allergy is a unique immunological disorder of the airways.

SAFETY AND ASIDE EFFECTS

Millions of subcutaneous immunotherapy injections are administered annually. The risk of a fatal or near-fatal systemic reaction is extremely small, but not completely absent.

I Systemic reactions

1. Non-specific reactions - discomfort, nausea, headache, arthralgia.

2. Mild systemic reactions; mild rhinitis/asthma.

3. Non-life-threatening systemic reactions; urticaria, angioedema, severe asthma.

4. Anaphylaxis; itching, urticaria, bronchospasm, with hypotension, requiring intensive care.

II Risk Factors: Uncontrolled asthma, Severe asthma, Use of beta blockers, Build-up phase, Use of new vials, Technical errors.

LONG-TERM BENEFITS OF SIT

- Long-lasting efficacy is between 5 yrs and 7 yrs
- Prevention of new sensitizations
- SIT prevents the development of asthma in children with allergic rhinitis
- Patients sensitive to a single allergen versus those who are polysensitized benefit more from immunotherapy.
- Allergen immunotherapy is more effective in children and young adults.
- Allergen immunotherapy preferably should be initiated as early as possible, in the earliest phases of the disease, in order to prevent additional sensitization and/or the onset of asthma.

INJECTION TECHNIQUE

Use upper outer surface of arm; Ensure sterile technique

Use 1ml syringe and orange needle; Inject at 45º by deep subcutaneous route

Record any local/systemic reaction

NON-INJECTION METHODS OF ADMINISTRATION

Sublingual immunotherapy (SLIT): allergen kept under the tongue for 1-2 minutes, then swallowed

Oral immunotherapy (OIT): allergen immediately swallowed, as drops, tablets or capsules.

Local nasal (LNIT): allergen sprayed into the nostrils as aqueous solution or dry powder.

Local bronchial (LBIT): allergen inhaled with a deep inspiration. Not recommended for clinical use, due to insufficient demonstration of efficacy and the occurrence of side effects.

SLIT is frequently used. The most frequently reported side effects are local (gastrointestinal); oral itching/swelling, nausea, stomach-ache. The side effects are usually mild and treatment discontinuation is rarely required.