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Evaluation of Six Years Allergen Immunotherapy in Allergic Rhinitis and Allergic Asthma

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ABSTRACT

Allergen immunotherapy involves the administration of gradually increasing quantities of specific allergens to patients with IgE-mediated conditions until a dose is reached that is effective in reducing disease severity from natural exposure. In the present study we evaluated a period of six years immunotherapy allergic rhinitis and allergic asthma patients with positive skin prick test of common aeroallergen. The immunotherapy was performed on 156 patients. One hundred twenty of the cases were allergic rhinitis (80%), 29 cases had allergic asthma and 7 cases were mixed (4.5%). 70% in allergic rhinitis group, 75% in allergic asthma group and 42.8% in mixed group completely improved. Immunotherapy, an older therapeutic method, has now been updated, and with appropriate indications, precautions and methods, has been clearly shown to be effective in the treatment of allergic rhinitis and in some cases of asthma and insect hypersensitivity.

Key words: Allergic rhinitis; Asthma; Immunotherapy

INTRODUCTION

Allergen immunotherapy (also called allergy shots) is the process of administering gradually increasing doses of allergens to a person with allergic disease for the purpose of reducing or eliminating the patient's adverse clinical response on subsequent natural exposure to these allergens.^{1,4,6} When properly administered to an appropriate candidate, allergen immunotherapy is a safe, effective form of therapy capable not only of reducing or preventing symptoms, but also potentially altering the natural history of the disease by minimizing the disease duration and preventing the disease progression.^{1,2,4,5}

Immunotherapy initially increases the levels of specific IgE, however levels of this antibody are ultimately decreased, and seasonal rises are avoided. Conversely, specific IgG levels increase in the early phase after vaccination. This is predominantly characterized by increased levels of IgG₁ initially, then IgG₄. Allergen Immunotherapy has been shown to be effective in treatment of stinging-insect hypersensitivity, allergic rhinitis and conjunctivitis, and allergic asthma.

MATERIALS AND METHODS

This study was performed from October 1998 to October 2004 in Dr. Farid's Allergy Clinic. In this study we evaluated a period of six years immunotherapy for allergic rhinitis and allergic asthma in patients with positive skin prick test to common

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Allergen Immunotherapy

aeroallergens. The base of aeroallergens is protein and prepared by Dom-Hollister Company in USA. We did not use the RAST and total IgE measurement, because prick test is highly sensitive and gold standard for allergic disorder diagnosis and cheaper than RAST and measurement of IgE. The criteria for allergic rhinitis symptoms included 1) nasal blockage, 2) sneezing, 3) nasal and throat itching.

Criteria for allergic asthma symptoms included 1) cough, 2) wheezing 3) short of breath and 4) tachypnea.

In our study 156 cases were chosen.

The mean age of patients was 36.5 years (range 9-65 years). The Patients with mild to moderate asthma and allergic rhinitis were selected for immunotherapy when they showed no effective response to medical treatment and positive history for atopy. 48 out of 156 cases, who were treated, were males (30.8%), mean age 35 years and 108 cases were females (69.2%), mean age 38 years. Immunotherapy was done for thirty months in all the patients with common aeroallergen and house dust mite extract. These products were made from common aeroallergen in northeastern region of Iran by Dome Hollister US Company. Our program for injection of the extract with vial with dilution of 1/10000pg was one injection every week for ten weeks and one injection with dilution of 1/1000pg every other week for the other ten weeks and one injection monthly from dilution of 1/100pg for two years. We continued the medical treatment in the period of immunotherapy according to the patients' conditions. The patients were followed up after completion of immunotherapy for allergic rhinitis and allergic asthma, and based on symptoms observed by the principal investigator at the time of visit and review of the subjects after treatment, the subjects' overall conditions of allergic rhinitis and allergic asthma were assessed. After treatment a questionnaire was handed to the patients. Our analysis showed that the total symptoms including nasal blockage, nasal discharge, nasal and throat itching, cough, short of breath, wheezing, and tachypnea were the main outcome parameters evaluated.

RESULTS

The Immunotherapy was performed on 156 patients. One hundred twenty of cases had allergic rhinitis (80%), 29 cases had allergic asthma (18.5%) and 7 cases were mixed (4.5%). We divided total patients in three groups on the basis of response to treatment, good response, when the patients had no signs and symptoms that we consider in criteria of our

study design. In moderate response two signs and symptoms of patients were resolved and no response, when any sign and symptom of patients not improved. All patients received common aeroallergen and house dust mite extract for immunotherapy for thirty months. Mean age of patients 36.5 years, 48 cases were male (30.8%), 108 cases were female (69.2%). All patients were given questionnaires after thirty months treatment. Analysis of the efficacy of treatment showed that immunotherapy significantly improved the signs and symptoms of all the groups (Figure 1).

In allergic rhinitis group 84 cases (70%) completely improved, 22 patients (18.3%) moderately responded and no response to immunotherapy was seen in 14 patients (11.4%). In allergic asthma group, 22 cases completely improved (75%), 4 cases (13.7%) moderately responded and no response to immunotherapy was detected in 3 cases (10.3%). In mix group, 3 cases (42.8%) completely improved, 3 cases (42.8%) moderately responded and no response was seen in 1 case (14.3%). In this study we did not find any systemic reaction but some local reactions (erythema, local tenderness).

Table 1. Response to treatment (percent and number)

Disease	Response		Good		Moderate		No Response	
	N.	%	N.	%	N.	%	N.	%
Allergic Rhinitis	84	70	22	18.3	14	11.4		
Allergic Asthma	22	75.8	4	13.7	3	10.3		
Mix group	3	42.8	3	42.8	1	14.3		

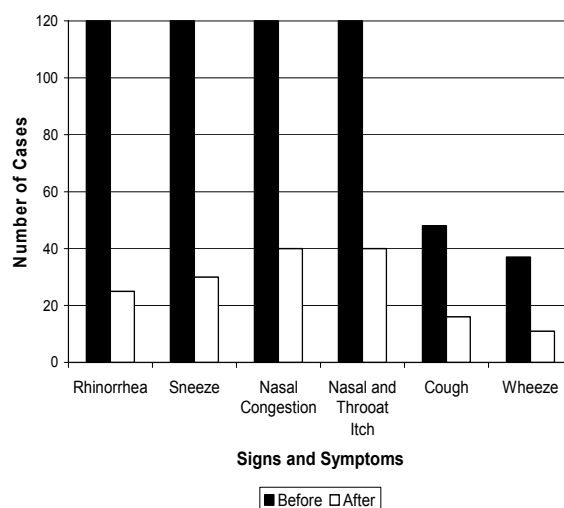


Figure 1. Effect of immunotherapy on signs and symptoms of patients with allergic rhinitis and asthma before and after treatments

DISCUSSION

The primary aim of this study was to investigate the efficacy of immunotherapy in the treatment of allergic rhinitis and allergic asthma patients.

The efficacy of allergen immunotherapy has been known since 1911, when Dr Noon, an extract of grass pollen, injected into a person in England whose allergic symptoms coincided with the pollination of grass.^{1-3,6}

A review of 18 published studies involving 789 patients concluded that immunotherapy is highly effective in the treatment of allergic rhinitis.⁶ Multiple studies have shown that immunotherapy is effective for the treatment of nasal allergies, both in adults and children.⁵⁻⁷

An extensive review of immunotherapy as a treatment for allergic rhinitis in children showed that the only treatment effective for the natural course of the disease is immunotherapy.

Immunotherapy may prevent the onset of asthma, and a review of multiple studies showed that allergen immunotherapy is also an effective treatment for asthma. These studies have indicated that treatment by immunotherapy results in reduced symptoms of asthma and improved pulmonary functions, and at the same time, reduced the need for asthma medications.^{4,6,7}

At five years of age is the youngest recommended age to start immunotherapy in the United States; younger children may be in cooperating with the immunotherapy program.

There is no upper age limit for receiving immunotherapy. In considering immunotherapy in older persons, attention must be given to the other medical conditions (such as cardiac disease) that are more frequent in older individuals, which could potentially make immunotherapy more risky. Moreover individuals with allergic rhinitis or allergic asthma who show allergic rhinitis or allergic asthma after natural exposure to airborne allergens, evidence of specific relevant allergic antibodies (IgE) and one of the following issues may benefit from immunotherapy:

In our study, the efficacy of immunotherapy on treatment of allergic rhinitis, allergic asthma and mix group were shown especially in allergic rhinitis. [Allergic rhinitis group (70%), Allergic asthma group (75%) and mix group (42.8%) had completely improved]. Failure to respond to immunotherapy may

be due to several factors including: inadequate dose of allergen in the allergy vaccine, missing allergens not identified during the allergy evaluation, high levels of allergen in environment (i.e. inadequate environmental control), significant exposure to non-allergic triggers (i.e. tobacco smoke). One of the previous studies showed no significant benefit for allergen injections in the treatment of perennial asthma in children, over a period of 30 months. Possible explanations for this result are that these patients did not have severe asthma to show an effect, that they were over-medicated or that the allergens were not potent enough.

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