Original Article

An Assessment of Effectiveness of Immunotherapy in Pollen Allergic Patients

Nosheen Zaidi, Najma Javed, Obaidur-ur-Rehman

Abstract

Background: Allergen-specific immunotherapy (SIT) is a well established treatment option for patients with allergic rhinitis with or without associated asthma that can modify the allergic disease process. **Aim:** To assess clinical efficacy of immunotherapy in patients presenting with pollen allergy. **Study design:** A cross sectional hospital based study. **Settings and Duration:** Conducted at Allergy Center, National Institute of Health (NIH), Islamabad during April – October 2011. **Subjects and Methods:** 100 patients visiting the Allergy Center, NIH with more than two years history of rhinitis, sneezing, asthma of both genders were included. All patients had positive skin prick test. Selected subjects were explained about the nature of the study and informed consent to participate in the study was taken from them. Information on common clinical presentation, duration of allergy, duration of vaccine use, change in disease attacks after vaccine, and quality of life was recorded on pre developed and pre tested questionnaire. **Results:** A total of 100 patients were enrolled. 57 patients were found to have allergy against grass, 33 against pollen tree and 53 were allergic to weed. Common clinical symptoms were sneezing (93%), runny nose (90%) and wheezing (87%) followed by redness in 69% of cases. Majority 66 (65.3%) had positive family history for allergy while 34 (33.7%) did not. Time for which patients were on immunotherapy was 1, 2, and 3 years where majority being on vaccine for one year. Before vaccine only 12 patients used to have less acute and frequent attacks compared to 88 patients who had severe attacks. After starting allergy vaccine 71 patients had complete relief with no acute attacks at all, however 05 patients starting having more frequent acute attacks than before whereas 24 patients reported having less attacks but not complete relief. Quality of life in terms of day to day activities and freedom to move out without having acute symptoms was improved in 82% of cases while 18% of the patients did not have such improvement. **Conclusions:** Immunotherapy serves to build up long term resistance against the sensitized allergen. Avoidance to allergen, use of medication and immunotherapy are the three regimes employed to combat the disease.

INTRODUCTION

Allergy - a hypersensitivity of our immune system to allergen is a common illness which can manifest as asthma in chronic conditions. Allergy is basically a type 1 hypersensitivity reaction in which large amounts of IgE are produced being specific for a particular allergen. [1] Pollen allergy affects at least 10% of the global population, and up to one-third of the affected individuals displaying hay fever symptoms will later develop allergic asthma. Allergic rhinitis (an allergic inflammation of the nasal airways) is an extremely common disorder. For example in the UK 1 in 5 people have allergic rhinitis with approximately 50 percent of those with allergic rhinitis being allergic to grass pollen. Over half of people receiving symptom based treatments report that they benefit poorly or only partially.[2] The difference between a normal infectious immune response and a type 1 hypersensitivity response is that in type 1 hypersensitivity the antibody is IgE instead of IgA, IgG, or IgM. During sensitisation, the IgE antibodies bind to Fc receptors on the surface of tissue mast cells and blood basophils.[2] Mast cells and basophils coated by IgE antibodies are "sensitised." Later exposure to the same allergen cross-links the bound IgE on sensitised cells,

resulting in degranulation and the secretion of pharmacologically active mediators such as histamine, leukotriene (LTC4 and LTD4), and prostaglandin that act on the surrounding tissues. The principal effects of these products are vasodilation and smooth-muscle contraction.[3]

Various treatment strategies are adopted to suppress the disease which includes avoidance of allergens, medical treatment and immunotherapy. Allergen immunotherapy also called allergy vaccine therapy is basically administration of gradually increasing quantities of specific allergen to allergic patients until a dose level is reached where it reduces symptomatic expression of the disease.[4] The major objective of allergen immunotherapy is to reduce the response to allergic triggers that precipitate symptoms in short term and to decrease inflammatory response and prevent development of persistent disease in long term.[5] Allergen specific immunotherapy is the only treatment approach which treats the underlying cause of the allergic disorder. It is a cost-effective treatment which results in an improved quality of life and a reduction in allergic- and allergen-related asthma, as well as a reduction in days off school/work[5]**.** Pollen and dust allergic diseases are quite common in Pakistan but they remain under-diagnosed. The prevalence data of allergic rhinitis shows an alarming situation.[6] The burden of pollen in Islamabad in 2011 has been much higher approximately 40,521 pcm *per Cubic Meter) and mostly individuals are allergic to "Paper mulberry". [7] Concentration of pollen in atmosphere rise during the month of March and April and individuals sensitive to pollen are advised to take precautionary measures. The common signs and symptoms experienced by pollen allergic patients include sneezing accompanied by runny nose, itchy eyes, nose and throat**,** watering eyes**,** reddening of eyes and wheezing. [1, 8]

Present study reveals common symptoms associated with allergy, duration of vaccine use reduction in frequency of acute attacks and improvement in quality of life.

Methodology

Study Design: A cross sectional hospital based study

Study Population/setting: Allergic patients undergoing immunotherapy/vaccination.

Study Tool: Close ended questionnaire

Sample Size: 100

Study Duration: April – October 2011

Sampling Technique: Simple convenience sampling

Methods: 100 patients visiting the Allergy Center, NIH with more than two years history of rhinitis, sneezing, asthma (seasonal pollen allergy) of both genders were included in the study. All such individuals were subjected to skin prick test after going through detailed medical history and examination by the medical officer. Skin prick test contains different allergens which are injected to the individual through deep skin prick to check for the specific type of allergen he/she is allergic to. Different allergens used for skin prick test includes pollen, paper mulberry, dust and grass.

Individuals positive for pollen allergen skin prick test and on vaccination were taken as cases for study. Selected subjects were explained about the nature of the study and informed consent to participate in the study was taken from them. Information on their common clinical presentation, duration of allergy, duration of vaccine use, change in disease attacks after vaccine, change in symptoms and change in quality of life was recorded on pre tested questionnaire.

INCLUSION CRITERIA

Individuals with seasonal two years history of runny nose, redness and watering of eyes, shortness of breath, sneezing and itching and on immunotherapy. Individuals should not have food allergy and should be younger than 50 years.

EXCLUSION CRITERIA

Individuals having less than 3 months history of allergy symptoms, and those more than 50 years.

Data Analysis: was done by using SPSS (Statistical Package for the Social Sciences) Version 17.

RESULTS

A total of 100 patients were enrolled. On the basis of skin prick test performed previously, 57 patients had grass allergy, 33 had pollen tree allergy and 53 were allergic to weed. Common clinical presentations are shown in Figure 1. Commonest symptom was sneezing (97%) followed by runny nose and wheezing respectively. Majority66 (65.3%) had positive family history for allergy while 34 (33.7%) did not. Family history was based on the symptoms and not on lab tests

or skin prick test. Time for which patients were on allergy vaccine is shown in figure 2. Before allergy vaccine only 12 patients out of 100 used to have less frequent acute attacks compared to 88 patients who had more frequent and severe attacks. After starting immunotherapy 71 patients had complete relief with no acute attacks at all, however 05 patients starting having more frequent acute attacks than before whereas 24 patients reported having less attacks but not complete relief. After one year being on pollen/ dust immunotherapy using consecutive doses of vaccines for their specific symptoms (sneezing, runny nose and wheezing), typical relief from symptoms was excellent in 70% of cases, satisfactory in 28% while 2% did not have any improvement in symptoms. Quality of life in terms of day to day activities and freedom to move out without having sudden severe attacks was improved in 82% of cases while 18% of the patients did not found such improvement.

Figure-1
Showing common clinical presentation among patients

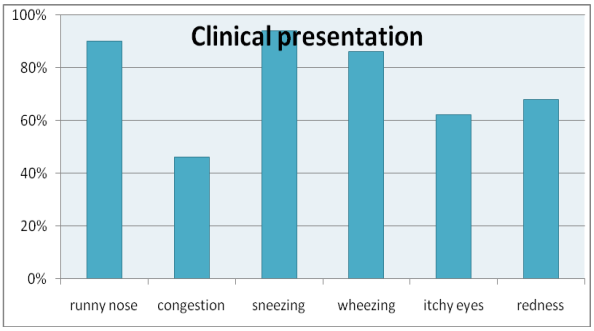
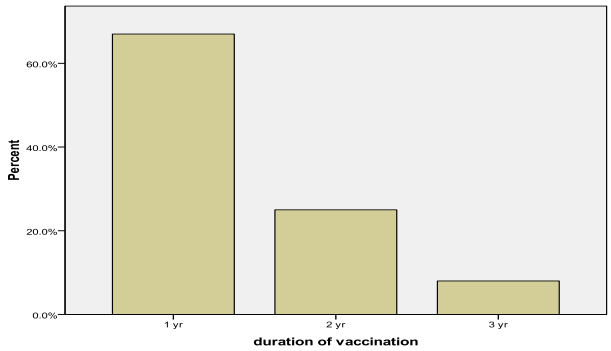


Figure-2
Showing duration of allergy vaccine usage among patients



DISCUSSION

Allergy is a hypersensitivity of immune system. Immunotherapy plays a vital role in suppressing the symptoms experience by effected individuals. To make a definite diagnosis of allergy, IgE mediated type I hypersensitivity skin testing typically is performed by scratching diluted allergen to the skin surface or by injecting it intradermally. A positive skin test result reflects the presence of specific IgE antibodies to the tested allergen and a correlation of specific IgE antibodies with the patient's symptoms. Individuals are usually vaccinated for a period of one year or more and response in terms of relief of symptoms is taken as an indicator to measure the efficacy of vaccine. [9]

People may inherit a tendency to be allergic, although not to any specific allergen. Children of allergic parents are much more likely to develop allergies than other children. Even if only one parent has allergies, a child has a one in four chance of being allergic.[10] In current study 66 (65.3%) out of 100 patient gave positive allergy family history compared to 34 (33.7%) who did not. Common clinical symptoms found in our study were sneezing (93%), runny nose (90%) and wheezing (87%) followed by redness of eyes in 69% of cases. Noori et al in their study documented the frequency of wheezing 15.2% and that of allergic rhinitis 4.3%.[11] Our study findings show higher frequencies, may be due to the fact that it's a hospital based and not community based study. Our study results reveal that immunotherapy relieved symptoms and brought an improvement in lives of the patient in better way as compared to medicines. This is in co-relation with another study that immunotherapy for allergic rhinitis reduces the risk of later development of asthma. [6]

The efficacy of immunotherapy is proven by decreasing frequency and severity of allergic rhinitis attacks [12]Other studies also reported that immunotherapy has shown to produce long-term remission of allergic symptoms,[13] reduce severity of associated asthma, as well as reduce the chances of new sensitisations to allergen's developing mainly through modulating the immune system response to allergens.[14] Same is found in our study where after starting allergy vaccine. 71 patients had complete relief with no acute attacks at all, however 05 patients starting having more frequent acute attacks than before.

CONCLUSION

Immunotherapy serves to build up long term resistance against the sensitized allergen as compared to medication. Combination of avoidance to allergen, use of medication and immunotherapy are the three regimes employed to combat the disease.

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AUTHORS

- **Dr. Nosheen Zaidi**
  Assistant Professor Community Medicine
  Foundation Medical University Rawalpindi
- **Dr. Najma Javed**
  Medical officer
  Pakistan Research Council Islamabad
- **Dr. Obaidur-ur-Rehman**
  House Officer
  Foundation Hospital Rawalpindi