



Effect of Immunotherapy on Patients with Bronchial Asthma

Authors

Ali M. Algamdi¹, Muslah S. Alalyany²

¹Senior Registrar Internal Medicine

²Pharmacist

Abstract

Immunotherapy, also known as allergen-specific immunotherapy or desensitization, involves gradually increasing doses of specific allergens to induce immune tolerance and modify the allergic response. The therapy aims to alleviate symptoms, reduce medication usage, and potentially modify the underlying disease process. Several studies have investigated the effects of immunotherapy on asthma patients, providing insights into its clinical efficacy and safety.

Research studies have shown positive outcomes of immunotherapy in bronchial asthma. A randomized controlled trial demonstrated significant improvements in asthma symptoms, decreased medication use, and reduced airway hyperresponsiveness in patients who received subcutaneous immunotherapy compared to the placebo group. Another study focusing on children showed improvements in lung function and reduced asthma exacerbations with sublingual immunotherapy.

Long-term effects of immunotherapy were explored in a prospective cohort study on adults with moderate-to-severe persistent allergic asthma. The study found sustained improvements in asthma control, reduced rescue medication use, and a decreased risk of exacerbations in patients who received immunotherapy compared to those who did not.

Introduction

Bronchial asthma, a chronic respiratory disease characterized by airway inflammation and hyperresponsiveness, affects millions of individuals worldwide. It is associated with significant morbidity and mortality, leading to a substantial burden on patients, healthcare systems, and society as a whole. Although bronchodilators and corticosteroids are widely used in the management of asthma, a significant proportion of patients continue to experience symptoms and

require additional therapeutic approaches Viegi (2006).

In recent years, immunotherapy has emerged as a promising treatment modality for bronchial asthma. Immunotherapy, also known as allergen-specific immunotherapy or desensitization, involves the administration of gradually increasing doses of specific allergens to induce immune tolerance and modify the allergic response. This therapy aims to alleviate symptoms, reduce the need for medication, and

potentially modify the underlying disease process Cox (2011).

Several studies have investigated the effects of immunotherapy on patients with bronchial asthma, providing valuable insights into its clinical efficacy and safety. For instance, a randomized controlled trial by Blumberga et al. (2006) evaluated the effect of subcutaneous immunotherapy on asthma control and airway inflammation in allergic asthma patients. The results showed a significant improvement in asthma symptoms, decreased medication use, and reduced airway hyperresponsiveness in the immunotherapy group compared to the placebo group.

Moreover, a systematic review and meta-analysis conducted by Bahceciler et al. (2005) examined the impact of sublingual immunotherapy on lung function and asthma control in children with allergic asthma. The findings demonstrated a significant improvement in forced experimental volume in one second (FEV1) and a reduction in asthma exacerbations in the sublingual immunotherapy group compared to the control group.

Furthermore, a prospective cohort study by Kwah et al. (2019) investigated the long-term effects of immunotherapy in adults with moderate-to-severe persistent allergic asthma. The study revealed a sustained improvement in asthma control, reduced rescue medication use, and a decreased risk of exacerbations in patients who received immunotherapy compared to those who did not.

While the evidence suggests the potential benefits of immunotherapy in bronchial asthma, it is crucial to consider certain factors such as patient selection, treatment protocols, and safety profiles. Not all asthma patients are suitable candidates for immunotherapy, and careful evaluation by healthcare professionals is necessary to determine eligibility Moote (2018).

Research Design

Randomized Controlled Trial (RCT): Divide the participants into two groups randomly, where one

group receives immunotherapy and the other group serves as a control.

Participants

Inclusion Criteria

Individuals diagnosed with bronchial asthma.

Age range (18-65 years).

Stable asthma symptoms.

Willingness to participate.

Exclusion Criteria

Participants with other respiratory diseases

Significant comorbidities

Pregnant or breastfeeding women

Individuals who have received immunotherapy previously.

Sample Size Determination

20 experimental patients

2020 control patients

Randomization

Randomly allocate participants into the intervention (immunotherapy) group.

Control group using a computer-generated randomization sequence.

Intervention

Immunotherapy group

Administer immunotherapy (subcutaneous or sublingual) according to a standardized protocol. Adjust the dosage and frequency based on individual tolerance and response.

Control group

Provide a placebo or standard treatment (inhalers, corticosteroids) to maintain their usual asthma management.

Data Collection

Conduct baseline assessments before the intervention and follow-up assessments at specified time points (3 months, 6 months, 12 months).

Collect data on outcome measures using validated questionnaires, spirometry, medical records, and laboratory tests.

Data Analysis

Analyze the data using appropriate statistical methods (t-tests, chi-square tests, analysis of variance) to compare the outcomes between the immunotherapy and control groups.

Consider additional analyses, such as subgroup analysis based on disease severity or allergic sensitization patterns.

Research Tools

Asthma Control Questionnaire (ACQ): Assess the level of asthma control and symptom severity.

Peak Expiratory Flow (PEF) Meter: Measure the maximum airflow rate during forced expiration to evaluate lung function.

Asthma Quality of Life Questionnaire (AQLQ): Evaluate the impact of asthma on an individual's quality of life.

Serum IgE Level Measurement: Assess the immunological response by measuring the serum levels of immunoglobulin E (IgE), an indicator of allergic sensitization.

Medical Records: Gather information about participants' medical history, asthma diagnosis, previous treatments, and exacerbation episodes.

Spirometry: Conduct pulmonary function tests using a spirometer to assess lung function parameters, such as forced expiratory volume in one second (FEV1) and forced vital capacity (FVC).

Participant Questionnaires: Design questionnaires to collect demographic information, asthma-related symptoms, medication usage, and patient-reported outcomes.

Randomization Software: Utilize computer-generated randomization software to allocate participants into the intervention and control groups.

Conclusion

Bronchial asthma is a significant respiratory disease with a substantial impact on individuals and society. While bronchodilators and corticosteroids are commonly used, many patients still experience symptoms and require additional

treatment options. Immunotherapy has emerged as a promising approach for bronchial asthma, offering the potential to alleviate symptoms, reduce medication dependence, and modify the disease process.

Numerous studies have provided valuable insights into the clinical efficacy and safety of immunotherapy in asthma patients. Randomized controlled trials have shown significant improvements in asthma symptoms, reduced medication usage, and decreased airway hyperresponsiveness with subcutaneous immunotherapy. Sublingual immunotherapy has also demonstrated positive outcomes, including improved lung function and reduced asthma exacerbations in children.

Long-term effects of immunotherapy have been studied in adults with moderate-to-severe persistent allergic asthma, revealing sustained improvements in asthma control, reduced rescue medication use, and a lower risk of exacerbations in patients receiving immunotherapy.

However, it is important to carefully consider patient selection, treatment protocols, and safety profiles when considering immunotherapy for asthma. Not all patients are suitable candidates, and healthcare professionals should evaluate each individual to determine eligibility.

Further research is needed to better understand the efficacy, safety, and long-term outcomes of immunotherapy in bronchial asthma. Nonetheless, the existing evidence suggests that immunotherapy holds promise as an additional therapeutic approach that can benefit a significant proportion of asthma patients, potentially improving their quality of life and reducing the burden of the disease on individuals and society as a whole.

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