Specific Immunotherapy for Allergies and Asthma

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Allergies affect 20 to 25% of the North American population. For some, symptoms are mild and easily ignorable or treatable, but, for many, the allergy seasons mean drippy misery, poor sleep, and reduced productivity. For many of those struggling with allergy symptoms, specific immunotherapy will be life-changing. The traditional indication for allergy immunotherapy is failure to derive sufficient improvement from avoidance measures and medications. By the end of this short article, however, I’ll propose consideration of a broader set of indications.

The following are six statements about specific immunotherapy (SIT) for allergic rhinitis and asthma. I’ll go through these statements one-by-one, citing recent high-quality publications supporting the statements. Then, I’ll make suggestions for ways to incorporate these ideas into daily medical practice.

**Ryan’s Case**

Ryan, 38, had rhinorrhea, sneezing, and watery, itchy eyes. Allergy medications helped but not enough. Last winter he was prescribed albuterol for wheezing with bronchitis. He’s stopped working because of wheezing (see Table 1).

The Expert Panel Report 3** (NAEPP, NHLBI) designates that a 12% or more increase in FEV1 after inhalation of short-acting bronchodilator is one diagnostic criterion of asthma. Ryan meets this criterion.

After a month of low dose inhaled corticosteroid and PRN albuterol “rescue,” Ryan has resumed playing soccer, using his rescue beforehand. Allergy skin testing shows multiple allergies. He has made home environmental changes and takes daily antihistamine and nasal steroid spray in addition to immunotherapy. One year later, he’s off his allergy meds, no longer requires the inhaled corticosteroid, and rarely needs his rescue inhaler.

| Table 1 |
|------------------|------------------|------------------|
| **Ryan’s Spirometry before and after Albuterol** | | |
| | Before* | After* | % Change |
| FVC | 118 | 132 | 11.9% |
| FEV1 | 93 | 128 | 37.6% |
| FEV1% | 79 | 97 | — |
| MEF | 59 | 116 | 96.6% |

*Expressed as % of predicted value for age, height, and gender
Immunotherapy Improves Allergic Rhinitis (AR)

- A Cochrane Review of sublingual immunotherapy (SLIT) looked at 60 randomized controlled trials and concluded that SLIT causes a significant improvement in symptoms score and medical use in allergic rhinitis.
- An analysis of meta-analyses for specific immunotherapy (SIT) found it efficacious in treating respiratory allergy.
- A study of patients with allergic rhinitis and allergy to Alternaria showed that just 10 months of SLIT made a significant reduction in symptom scores, medication use, and skin prick test reactivity.
- In India, one year of subcutaneous immunotherapy (SCIT) for cockroach allergy caused significant improvement in clinical parameters compared to the placebo group.
- Another recent study reviewed multiple meta-analyses evaluating the efficacy of immunotherapy for allergic rhinitis and asthma. It concluded that these meta-analyses “clearly demonstrated” that immunotherapy is effective for these diseases.

Immunotherapy Improvement is Long-lasting

- A 15-year prospective study of patients monosensitized to house dust mites showed that patients who received three years of SLIT had clinical improvement that lasted seven years after stopping therapy. Those who received four or five years of SLIT had improvement that lasted eight years.

“Improvement” was defined as clinical scores below 50% of baseline.

- A five-year study of grass tablet immunotherapy consisted of three years of immunotherapy and two additional years of follow-up. A combined symptom-medication score showed a 33% reduction in the active group compared to the placebo group, and this effect persisted for the additional two years of the study.

- A five-year prospective study of patients allergic to house dust mites exposed participants to three or five years of immunotherapy. The study found significant clinical improvement at three years. By five years, both groups remained similar, with only rhinitis showing better control in the five-year immunotherapy group. They concluded that three years may be sufficient for house dust mite immunotherapy.

Immunotherapy Decreases Development of New Allergies

- An Italian study followed 134 children with AR monosensitized to house dust mites. The study group received three years of SCIT plus medication, and the control group received medication alone. After six years, 66% of the children in the control group had developed additional allergic sensitization, while only 25% of those in the SCIT group had new sensitization.

- A retrospective study of over 8,000 adults monosensitized to one of half a dozen ubiquitous antigens gave four years of immunotherapy to approximately half of the participants. After seven years (three years after those receiving SCIT stopped getting injections), 77% of the control group
patients had additional sensitivities compared to 27% of the SCIT group.

**Immunotherapy Decreases Asthma Development in AR Patients**

- Children received three years of SCIT. Seven years later 45% of controls had asthma vs. 25% in the SCIT group.
- Children received four to five years of SLIT to address house dust mite sensitivities. After five years, there was significantly less asthma and asthma medication need vs. baseline. Controls did not change from baseline.

**AR Means a Risk of Pulmonary Inflammation and Asthma**

- Nearly 70% of 1,400 patients with persistent AR had improved airway indices after bronchodilator.
- Ten years after initial presentation, 46.1% of patients with AR, but no asthma, had asthma. Only 7.1% of those with other allergy problems (drug, food) developed asthma.
- In over 4,700 patients with AR without asthma, 14% had severe bronchial hyperreactivity (BHR), and 25% had mild BHR.

**Immunotherapy Improves Allergic Asthma**

- The Cochrane Review concluded that IT significantly reduced asthma symptoms, medications, and bronchial hyperreactivity.

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**Take-home Messages**

1. Allergic rhinitis (AR) is common.
2. Immunotherapy improves AR, decreases new allergies, and seems to decrease development of asthma in patients with AR.
3. Many AR patients have subclinical bronchial hyperreactivity without typical asthma symptoms.
4. In asthmatic patients, immunotherapy for inhalant allergens improves symptoms and decreases medication requirements.

- One year of SCIT in asthmatic children reduced symptoms, medication, and specific IgE.
- Asthmatic patients received three years of SCIT or placebo. The SCIT group significantly improved on inhalation challenge, skin reactivity, and late asthmatic reaction.

Since allergy immunotherapy can change natural history of allergic rhinitis and decrease the development of new allergies and asthma, perhaps we shouldn’t reserve it only for medication-unresponsive patients.

**Practice Suggestions**

- Consider allergy testing all asthmatic patients.
- Consider pulmonary screening for all allergic rhinitis patients.
- Consider specific immunotherapy early on for its ability to modify the natural history of allergic rhinitis and asthma, rather than viewing it as a treatment of last resort.
References


Resources


** The EPR 3 Guidelines on Asthma were developed by an expert panel commissioned by the National Asthma Education and Prevention Program (NAEPP) Coordinating Committee (CC), coordinated by the National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health.

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