In patients with asthma, how do different allergen specific (AS) immunotherapies compare for reducing asthma symptoms, medication requirements, and improving bronchial hyper-reactivity (BHR)?

Review: allergen specific immunotherapies reduce symptoms, medication requirements, and bronchial hyper-reactivity in asthma


METHODS

MAIN RESULTS

75 RCTs met the selection criteria (n = 3506). Patients who received AS immunotherapy (particularly mite, pollen, and animal dander allergens) had greater symptom improvement, had reduced asthma medication requirements, and were less likely to develop increased non-specific or AS BHR than those who received placebo (table). When compared with untreated controls, patients in the AS immunotherapy group had greater improvement in lung function (2 RCTs; weighted mean difference [WMD] −15.20, 95% CI −23.09 to −7.31); and greater reduction in asthma symptoms (3 RCTs; WMD −6.93, CI −13.83 to −0.04), medication requirements (1 RCT; WMD −4.00, CI −4.79 to −3.21), and non-specific BHR (1 RCT; WMD −0.77, CI −1.11 to −0.43). No other comparison groups differed for lung function.

CONCLUSION

In patients with asthma, allergen specific immunotherapies reduce asthma symptoms, medication requirements, allergen specific bronchial hyperreactivity (BHR), and the development of increased non-specific BHR.

Abstract and commentary also appear in ACP Journal Club.

Commentary

The updated review by Abramson et al “confirms the efficacy of immunotherapy in terms of a reduction in asthma symptoms and use of asthma medication.”

This review discusses information about the benefits of immunotherapy but does not assess the risks or costs. The biggest concern is anaphylaxis. Using data from 1985–1992, the FDA estimated that the crude annual death rate for allergic extracts is low at 0.7 per million injections, which is roughly similar to fatal reactions to injected penicillin, which range from 0.13–0.4 fatalities per million injections. Clearly, precautions are needed. Although local reactions for AS immunotherapy injections are common, they are simple to manage.

The second relevant consideration regarding AS immunotherapy is cost. In 1996, the cost of AS immunotherapy for the first year was estimated to be US $800 per year and $170 for each year thereafter. In contrast, the newest therapy for asthma (Xolair) may cost US $12 000 per year. Immunotherapy decreases asthma medication use, offsetting its own cost, and may also further decrease costs by limiting the need for concurrent treatment of allergic rhinitis.

Finally, a recent European study tested the hypothesis that AS immunotherapy might prevent the development of asthma. After 3 years of therapy, children with allergic rhinitis who received AS immunotherapy were about half as likely to develop asthma as those who did not.

AS immunotherapy is safe and effective when administered by trained healthcare professionals who observe high standards of care.

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1 Turkeltaub PC. FDA Medical Bulletin 1994;24:7.

Allergen specific immunotherapies (ITs) vs placebo or untreated controls (UC) for reducing asthma symptoms

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Comparisons</th>
<th>Number of trials</th>
<th>Weighted event rates</th>
<th>RRRI [CI]</th>
<th>NNT (IC)</th>
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</thead>
<tbody>
<tr>
<td>Asthmatic symptoms</td>
<td>Mite IT vs placebo</td>
<td>12</td>
<td>30% vs 51%</td>
<td>38% [13 to 56]</td>
<td>5 [1 to 3]</td>
</tr>
<tr>
<td></td>
<td>Pollen IT vs placebo</td>
<td>3</td>
<td>21% vs 62%</td>
<td>75% [10 to 93]</td>
<td>3 [2 to 4]</td>
</tr>
<tr>
<td></td>
<td>Animal dander IT vs placebo</td>
<td>4</td>
<td>27% vs 69%</td>
<td>54% [6 to 78]</td>
<td>3 [2 to 17]</td>
</tr>
<tr>
<td></td>
<td>Overall IT vs placebo</td>
<td>22</td>
<td>29% vs 60%</td>
<td>49% [35 to 59]</td>
<td>4 [3 to 5]</td>
</tr>
<tr>
<td>Asthma medication</td>
<td>Overall IT vs placebo</td>
<td>16</td>
<td>48% vs 72%</td>
<td>54% [24 to 42]</td>
<td>5 [4 to 7]</td>
</tr>
<tr>
<td>requirements</td>
<td>Non-specific BHR</td>
<td>Overall IT vs placebo</td>
<td>5</td>
<td>30% vs 64%</td>
<td>53% [30 to 69]</td>
</tr>
<tr>
<td></td>
<td>Allergen specific BHR</td>
<td>Overall IT vs placebo</td>
<td>16</td>
<td>32% vs 63%</td>
<td>49% [37 to 59]</td>
</tr>
<tr>
<td></td>
<td>House dust vs placebo</td>
<td>1</td>
<td>11% vs 39%</td>
<td>71% [29 to 88]</td>
<td>4 [3 to 13]</td>
</tr>
</tbody>
</table>

*WMD = weighted mean difference; BHR = bronchial hyper-reactivity. Other abbreviations defined in glossary; weighted event rates, RRR, NNT, and CI calculated from data in article using a fixed effects model. Follow up not reported.