Review: Omalizumab reduces asthma exacerbations and daily steroid use

Walker S, Monteil M, Phelan K, Lasserson TJ, Walters EH. **Anti-IgE for chronic asthma.** Cochrane Database Syst Rev. 2003;(3):CD003559.

QUESTION

In patients with asthma, how effective is omalizumab, a recombinant humanized monoclonal antibody, in reducing asthma exacerbations and steroid use?

DATA SOURCES

Studies were identified by searching the Cochrane Airways Group trials register, scanning the reference lists of relevant studies and review articles, reviewing abstracts presented at leading respiratory society meetings, contacting pharmaceutical companies manufacturing anti-immunoglobulin E (IgE) formulations, and contacting experts in the field.

STUDY SELECTION

Studies were selected if they were randomized controlled trials comparing anti-IgE at any dose or route with placebo or conventional treatments in children and adults with chronic asthma.

DATA EXTRACTION

Data were extracted by 2 independent reviewers on study design and quality, route of administration, asthma severity and type, and outcomes. Main outcomes were reduction or termination of steroid use and asthma exacerbations (hospital admissions, emergency department visits, days lost from work or school, unscheduled physician visits, and increase in medication).

MAIN RESULTS

8 blinded, placebo-controlled trials of fair- to high-quality met the inclusion criteria (n = 2037). Omalizumab was administered by inhaler in 1 trial, intravenously in 3 trials, and subcutaneously in 4 trials. Results were reported for the stable-steroid phase and the steroid-reduction phase. During these phases, fewer patients who received omalizumab had ≥ 1 asthma exacerbation (Table). During the steroid-reduction phase, more patients who received omalizumab discontinued inhaled steroid use or had ≥ 50% reduction in use (Table). In both phases, patients who received omalizumab required less rescue medication and had fewer asthma symptoms (P < 0.05). The 1 trial of inhaled omalizumab showed no difference from placebo in the outcomes measured.

CONCLUSION

In patients with asthma, intravenous or subcutaneous omalizumab reduces asthma exacerbations when used as adjunctive or steroid-sparing therapy and reduces inhaled steroid use.

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Omalizumab vs placebo for chronic asthma at up to 24 weeks*

Outcomes	Number of trials	Steroid phase	Weighted event rates		RRR (95% CI)	NNT (CI)
			Omalizumab	Placebo		
≥ 1 exacerbation	3	Stable steroid	14%	26%	46% (33 to 57)	9 (7 to 13)
	3	Steroid reduction	18%	33%	44% (33 to 54)	7 (6 to 10)
					RBI (CI)	
Steroid withdrawal	4	Steroid reduction	40%	21%	85% (58 to 116)	6 (5 to 8)
≥ 50% reduction in steroid use	4	Steroid reduction	76%	56%	35% (26 to 45)	5 (5 to 7)

*Abbreviations defined in Glossary; RRR, RBI, NNT, and CI calculated from data in article using a fixed-effects model.

COMMENTARY

The role of monoclonal anti-IgE antibodies in clinical asthma management continues to evolve. Developed to neutralize and sequester circulating IgE antibodies in allergic persons, this treatment seems to have more complex immunologic effects than initially realized. Other beneficial effects include the down-regulation of IgE receptors on mast cells and basophils, and altering allergen presentation to the immune system, thereby preventing sensitization.

The meta-analysis by Walker and colleagues confirms the clinical benefits of anti-IgE therapy, including the reduction of asthma exacerbations and decreasing the requirement for preventive inhaled steroids. Other studies show improvement in quality of life and lung function, suggesting a clinical benefit that reflects its wide-ranging immunologic effects (1, 2). Furthermore, this benefit is evident in a range of asthma severity, including severe asthma where IgE was thought to be less important. Hence, anti-IgE is not simply a steroid-sparing treatment but seems to have other effects that cannot be achieved by inhaled steroids alone. Together with the fact that it can be injected every 2 to 4 weeks, it is a new method of asthma treatment with benefits that are additive and complementary to currently available medication.

However, the major limitation of anti-IgE currently is its cost-to-benefit ratio. The cost of the medication is currently about U.S. $10 000 per year, which far exceeds other forms of asthma treatment. From this point of view, the cost-to-benefit ratio still favors inhaled steroids and long-acting β-agonists as the foundation of achieving good asthma control in most patients. Nevertheless, there are patients maintained on optimal doses of these medications who continue to have poor asthma control or achieve control only with unacceptable side effects. In such patients, the direct and indirect costs of poor asthma control and frequent asthma exacerbations may well justify the cost of anti-IgE therapy. Looking ahead, if the cost of biotechnology and the price of this medication falls, it will be an adjunct to, and may well supplant, currently available inhaled steroids and long-acting β-agonists even in patients with mild asthma.

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2. **Busse W, Corren J, Lanier BQ, et al.** Omalizumab, anti-IgE recombinant humanized monoclonal antibody, for the treatment of severe allergic asthma. J Allergy Clin Immunol. 2001;108:184-90.