

# What Is the Role of Tiotropium in Asthma?: A Systematic Review With Meta-analysis

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## Abstract

### BACKGROUND

The role of tiotropium for the treatment of asthma has not yet been clearly defined. The aim of this systematic review was to assess the efficacy and safety of tiotropium in patients with asthma.

### METHODS

Randomized placebo-controlled trials were included. Primary outcomes were peak and trough FEV<sub>1</sub> and morning and evening peak expiratory flow (PEF).

### RESULTS

Thirteen studies (4, 966 patients) were included. Three different therapeutic protocols were identified. Tiotropium as an add-on to inhaled corticosteroids (ICSs) showed statistically and clinically significant increases in PEF (22-24 L/min) and FEV<sub>1</sub> (140-150 mL). Additionally, tiotropium decreased the rate of exacerbations (number needed to treat for benefit [NNTB], 36) and improved asthma control. The use of tiotropium in patients poorly controlled despite the use of medium to high doses of ICS was not inferior to salmeterol. Finally, the use of tiotropium as an add-on to ICS/salmeterol combination increased pulmonary function to a clinically significant magnitude, reduced asthma exacerbations (relative risk, 0.70; 95% CI, 0.53-0.94;  $P < .02$ ;  $I^2 = 0\%$ ; NNTB, 17), and improved asthma control compared with ICS/salmeterol. Tiotropium was well tolerated, and no potential safety signals were observed.

### CONCLUSIONS

Tiotropium resulted noninferiorly to salmeterol and superiorly to placebo in patients with moderate to severe asthma who were not adequately controlled by ICS or ICS/salmeterol. Major benefits were concentrated in the increase in lung function and in the case of patients with severe asthma, in the reduction of exacerbations.