Are beta-blockers safe to use in patients with asthma or COPD?

Evidence-based answer
Beta-blockers (cardioselective and nonselective) appear safe in patients with mild to moderate asthma or chronic obstructive pulmonary disease (COPD) and do not produce significant adverse respiratory effects (SOR: A, systematic review of RCTs). Beta-blockers are not associated with increased hospital admissions or length of stay and are, in fact, associated with fewer outpatient clinic visits. Avoiding beta-blockers in patients with asthma or COPD who present with acute coronary syndrome is associated with increased mortality (SOR: B, cohort studies).

Evidence summary
A Cochrane meta-analysis of 29 RCTs examined the effects of cardioselective beta-blockers in adults with mild to moderate asthma or COPD. The age range of participants was 20 to 65 years (mean age 40 years). Single-dosed cardioselective beta-blockers reduced forced expiratory volume in 1 second (FEV1) by 7.5% compared with placebo (19 trials, n=240; mean difference [MD] –7.5%; 95% CI, –9.3 to –5.6), without clinically significant adverse respiratory effects (specifically wheezing, dyspnea, or asthma exacerbation).

The change in FEV1 with use of a beta2-agonist after a beta-blocker was larger than the change with the use of a beta2-agonist after placebo (15 trials, n=444; MD 4.6%; 95% CI, 2.5–6.8). Continuous beta-blocker treatment that lasted 2 to 28 days produced no change in FEV1 (10 trials, n=136; MD –0.42%; 95% CI, –3.74 to 2.91), respiratory symptoms, or inhaler use compared with placebo. Most of the participants were relatively young, had only mild to moderate airway obstruction, and no recent asthma exacerbations. Many of the studies were of short duration.

A retrospective cohort study using Veteran’s Administration inpatient and outpatient records in Iowa and Nebraska examined possible associations between healthcare resources used (clinic
visits and hospital admissions) and beta-blocker therapy among patients with asthma or COPD.\textsuperscript{2} Patients with a diagnosis of asthma or COPD receiving treatment with beta-blockers or another cardiovascular agent were included (N=8,390, 97% male, mean age 67 years).

Adjusted for comorbidity and demographics, patients receiving selective beta-blockers had similar odds for hospital admission as those receiving other agents (OR for cardioselective beta-blockers 1.2; 95\% CI, 0.98–1.4; OR for nonselective beta-blockers 1.1; 95\% CI, 0.73–1.7, relative to the non–beta-blocker group). There was also no difference in length of stay. After adjusting outpatient visits related to asthma or COPD for comorbidity and other factors, patients receiving beta-blockers averaged approximately half as many outpatient clinic visits/year as those receiving other cardiovascular drugs (selective beta-blockers −0.47 visits; 95\% CI, −0.61 to −0.33; nonselective beta-blockers −0.54 visits; 95\% CI, −0.91 to −0.18).\textsuperscript{2}

A large retrospective cohort study evaluated current use of beta-blockers in patients with reactive airway disease (RAD, primarily asthma or COPD) who were hospitalized with acute coronary syndrome (ACS).\textsuperscript{3} The Get with the Guidelines database was used to evaluate use of a beta-blocker within 24 hours of admission and at discharge in patients with ACS who had (n=12,967) and did not have (n=81,140) a history of RAD. Data were collected in 435 hospitals between January 2000 and September 2006.

Compared with patients with no history of RAD, patients with a history of RAD were 42\% less likely to receive beta-blockers upon admission (OR 0.58; 95\% CI, 0.54–0.62) and 55\% less likely to receive beta-blockers at discharge (OR 0.45; 95\% CI, 0.41–0.48). However, receiving beta-blockers within 24 hours after admission was associated with a lower in-hospital mortality rate compared with patients not receiving beta-blockers, for patients both with RAD (OR 0.52; 95\% CI, 0.45–0.60) and without RAD (OR 0.38; 95\% CI, 0.34–0.42).\textsuperscript{3}

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