

# Beta-blockers reduce mortality in patients with COPD after vascular surgery

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In the first study to directly examine the effects of beta-blockers on surgical patients with chronic obstructive pulmonary disease (COPD), researchers have found that, contrary to previous thought, beta-blockers significantly reduce mortality in COPD patients.

"Patients with COPD frequently have unrecognized, atherosclerotic disease. This is also a major cause for late morbidity and mortality," said principle investigator Don Poldermans, M.D., Ph.D., of the Erasmus Medical Center in Rotterdam, the Netherlands.

The results were published in the first issue for October of the *American Journal of Respiratory and Critical Care Medicine*, published by the American Thoracic Society.

Clinical trials on the benefits of using preoperative beta-blockers to lower the risk of cardiovascular events in patients undergoing noncardiac surgery have yielded inconsistent results. Recent guidelines from the American Heart Association, however, recommend beta-blockers before noncardiac surgery for patients who are at high risk for or who have known cardiovascular disease.

But patients with COPD, who have an increased risk of cardiovascular disease, often do not receive preoperative beta-blockers because of concerns that the drugs will aggravate bronchospasm and worsen their airway obstruction. Moreover, the benefits of beta-blockers have not been examined in a population of patients with COPD undergoing

noncardiac disease.

To determine the effect of beta-blockers on COPD patients undergoing vascular surgery, the researchers evaluated the mortality outcomes of more than 3,000 consecutive patients who underwent vascular surgery at the Erasmus Medical Center in Rotterdam between 1990 and 2006. They specifically looked at the effect of a low dose of beta-blockers (less than 25 percent maximum recommended therapeutic dose) versus an "intensified" dosage (more than 25 percent maximum recommended therapeutic dose).

Of the 3,371 patients evaluated, 31 percent—more than 1000—received cardio-selective beta-blockers at their initial hospitalization. There was no apparent clinical differences between the patients with COPD— 39 percent of the entire study sample— and those without in terms of the likelihood of them receiving beta-blockers.

They found that cardio-selective beta-blockers were independently associated with reduced 30-day mortality in both patients with and without COPD. In the 30 days after surgery, COPD patients did not receive beta-blockers were twice as likely to die as those who did (eight percent versus four percent.) Over the long term, a similar trend, though not statistically significant, emerged. During the follow-up period, 40 percent of COPD patients on beta-blockers died, whereas 67 percent who were not on beta-blockers died.

"What was observed in the population, beta blockers, especially, cardioselective beta blockers like bisoprolol are well tolerated by COPD patients without inducing respiratory adverse effects. More importantly, they improve outcome, by preventing late cardiac events, a major cause for late morbidity and mortality," said Dr. Poldermans.

They also found that in COPD patients, an intensified dose, but not a

low dose, of beta-blockers was associated with reduced 30-day mortality, but in the long term, both intensified and low dosages were associated with similar reductions in mortality. In patients without COPD, both low and intensified doses were associated with reduced mortality in 30-days but in the long term, only the intensified dose was associated with a nonsignificant trend in reduced mortality.

"We found that an intensified dosing regimen appeared to be superior to low-dose therapy in terms of its impact on 30-day mortality," wrote Dr. Poldermans. "We [demonstrated] among a large group of well-characterized patients with COPD...that beta-blockers were safe and beneficial in prolonging survival after major vascular surgery."

"The indications of our findings are that a high-dose might be preferred in the COPD population," said Dr. Poldermans. "The safety of cardioselective beta blockers in the COPD population will support their use."

These findings demonstrate that carefully selected patients with COPD can tolerate cardioselective beta-blockers without experiencing respiratory complications. They also show that COPD patients may be protected by beta-blocker therapy from cardiovascular complications of surgery, such as myocardial infarction. These findings need to be put in context with the recent POISE (Perioperative Ischemic Evaluation) study that demonstrated higher mortality among general populations of patients – those with and without COPD – treated with preoperative beta-blockers.

Dr. John E. Heffner, past president of ATS and Garnjobst Chair at Providence Portland Medical Center, observed that "the jury remains out regarding the utility of preoperative beta-blockers for all patients at risk of cardiovascular complications from noncardiac surgery. But this study suggests that carefully selected patients with COPD, which is an extreme

risk factor for cardiovascular disease, at best may benefit but at least appear to tolerate cardioselective beta-blocker therapy. "

Source: American Thoracic Society

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