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Beta-blockade in high-risk surgical patients

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Keywords

Beta-blockers, bisoprolol, high-risk surgery, myocardial infarction, outcome, vascular surgery

Comments

This paper will undoubtedly change clinical practice since the perioperative use of bisoprolol dramatically reduced the number of cardiac events in a predetermined high risk population undergoing major vascular surgery. Further studies are required to explore whether this is a peculiarity of the cardioselective beta-blocker, bisoprolol, or whether any beta-blocker would produce the same result. The perioperative management of those patients without a positive result during dobutamine echocardiography requires investigating and perhaps it is this group, who presumably do not have significant coronary artery stenosis, who may benefit from beta agonists and 'optimisation' which also shows significant benefits in the high risk surgical patient. This study therefore begs the question 'should we be optimising these high risk vascular surgical patients with beta agonists or beta antagonists?' since studies have shown benefits with both of these diametrically opposite pharmacological agents.

Introduction

Major vascular surgery is associated with significant perioperative cardiac morbidity and mortality. Identification of patients who had particularly high risk of complications has focused research on interventions which may reduce this risk. Mangano studied the use of beta-blockade in this setting and showed an important reduction in mortality at 2 years in those receiving atenolol. However it lacked statistical power to show an effect on perioperative cardiac morbidity and mortality.

Aims

A randomised, multicentre study to examine the effects of perioperative bisoprolol (a beta-blocker) on the incidence of perioperative cardiac morbidity (nonfatal myocardial infarction) and mortality.

Methods

Over a 3 year period (1996-1999) high risk patients undergoing major vascular surgery were identified by a combination of clinical criteria and dobutamine echocardiography. Exclusions included patients with extensive wall-motion abnormalities on echocardiography and those already receiving beta-blockers. This latter group was analysed separately. High risk patients were then randomised to standard perioperative care, or standard care and bisoprolol. In the former group, beta-blockers were permitted at the discretion of the attending physician if signs or symptoms of myocardial ischaemia developed perioperatively. Cardiac events were monitored for 30 postoperative days.

Results

Of the 1351 patients screened, 846 proceeded to dobutamine echocardiography and 173 patients fulfilled the high risk criteria. One hundred and twelve patients were randomised, 59 to bisoprolol and 53 to standard care alone. Sixty-one patients were not randomised - 53 were already taking a beta-blocker and 8 had extensive wall-motion abnormalities.In those randomised, nine (17%) patients died in the standard care group of cardiac causes compared to two (3.4%) in the bisoprolol group. Nonfatal myocardial infarction was seen in nine (17%) patients in the standard care group compared to none in the bisoprolol group. The majority of events occurred in the first 7 postoperative days. Consequently, the trial was halted by the safety committee well short of the initially projected 266 patients. There were four (7.5%) deaths in the nonrandomised group who were already receiving beta-blockers.

Discussion

The combined incidence of cardiac events was 34% and 3.4% in the standard care and bisoprolol groups respectively. The high incidence of events in the standard care group is similar to that in a previous study performed in one of the study centres. Significant coronary artery stenosis is presumably important in the mechanism of these perioperative events, since they occurred almost exclusively in those patients with positive dobutamine echocardiography. Several mechanisms have been proposed to explain this important protective role of beta-blockade, including improvements in myocardial oxygen balance and dysrythmia protection during ischaemic episodes. The authors highlight the limitations of this study - the lack of blinding assuming the most importance. However, it is unlikely that unknown confounding factors could be responsible for this important reduction in cardiac events with the use of perioperative bisoprolol.

References

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