An observational study of perioperative risk associated with aortic stenosis (AS) in non-cardiac surgery

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Introduction

The magnitude of the perioperative risk associated with AS is relatively unknown. The last prospective trial was Goldman's derivation of the cardiac risk index in 1977[1]. The study had 23 patients with clinically diagnosed AS. Recent work has been retrospective with varying results. In three relatively large retrospective controlled trials two found no difference between the controls and asymptomatic patients with severe AS, and one an increase in major cardiac adverse events (MACE) but not mortality[2,3,4.] Apart from the retrospective nature, the trials had variable control criteria and different surgical populations in particular with regard to emergency and elective surgery. Our aim was to record the risks associated with AS in non-cardiac surgery and to try and identify pre-operative variables associated with the risk.

Method

Five centres in NZ agreed to participate in the study (Nelson, Auckland, Christchurch, Whangarei, Wellington). Patients were recruited pre operatively and information collected on a number of variables including demographics, co-morbidities, frailty, symptoms, echo parameters and laboratory investigations. Post operatively, 30-day mortality, one year mortality and major adverse cardiac events were recorded as outcomes. Regression analysis was used to identify univariate and then significant multivariate variables associated with these outcomes.

Results

147 patients were entered into the study. Severe AS was present in 61 (41.5%) and 86 (58.5%) had moderate AS. 104 patients (70.8%) had elective surgery and 43 (29.2%) emergency surgery. 31 patients (21%) patients died within 1 year and 13 (9%) of these within 30-days. 33 (22%) had a MACE. Significant univariate variables associated with all 3 outcomes were age, ASA, emergency surgery, NYHA classification, albumin, frailty and a history of congestive heart failure. Aortic valve area, surgical risk and MR were associated with mortality only. On multivariate analysis only emergency surgery was associated with all 3 outcomes. Aortic valve area and albumin were associated with 30-day mortality. Symptomatic AS was associated with increased MACE but not mortality.

Discussion

The incidence of AS in first world populations is largely related to advanced age, particularly over the age of 75 years. As the size of the elderly population increases so too will the influence of AS on perioperative outcome. This study identified AS is associated with 30-day mortality after non cardiac surgery. The increased risk is related to valve area with increasing valve area reducing risk (OR 0.03, CI 0-0.4). Emergency surgery was the only variable associated with 30-day mortality, one year mortality and

MACE. Patients with low albumin had increased MACE's and were more likely to die at 30 days post operatively. Translating these findings into a clinically useful approach can be done in a number of ways. At a simplistic level the crude rates of 30-day mortality (9%) and MACE (22%) can be used as a starting point and adjusted according to surgery type, symptomatic status, valve area etc. A more complex approach would be to calculate the expected mortality using existing morbidity and mortality calculators and then adjust to aortic valve area with each reduction in 0.1cm^2 increasing mortality by 10%.[5].

Summary

The study encourages anaesthetists to view reduction in valve area as a risk factor rather than categorisation into moderate and severe AS and focuses outcome on mortality. It also defines the role of emergency surgery, symptoms and albumin in this patient population.

References

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