Heart rate variability and cardiac troponin I are incremental and independent predictors of one-year all-cause mortality after major noncardiac surgery in patients at risk of coronary artery disease

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OBJECTIVES: The aim of this study was to determine whether perioperative measurements of heart rate variability (HRV) and cardiac troponin I (cTnI) add additional prognostic information to established risk scores for first-year mortality in patients at risk of coronary artery disease (CAD) undergoing major noncardiac surgery. BACKGROUND: In cardiac-risk patients undergoing major noncardiac surgery, the short- and long-term prognoses are mainly influenced by perioperative cardiac complications. Heart rate variability and cTnI are important prognostic markers in patients with congestive heart failure and myocardial infarction. METHODS: In a prospective study, 173 patients with CAD or at high risk of CAD undergoing major noncardiac surgery were followed up for one year. The main outcome measure was all-cause mortality. In addition to clinical parameters and established risk scores, HRV and cTnI were assessed perioperatively. RESULTS: Twenty-eight (16%) patients died within one year. Multivariate logistic regression analysis revealed three findings that were independently associated with death within the first year after surgery: the revised cardiac risk index (odds ratio 6.2 [95% confidence interval 1.6 to 25], depressed HRV before induction of anesthesia (16.2 [2.8 to 94]), and elevation of cTnI on postoperative day 1 or 2 (9.8 [3.0 to 32]). CONCLUSIONS: Depressed HRV before induction of anesthesia and elevated cTnI postoperatively are independent and powerful predictors of one-year mortality for patients at risk of CAD undergoing major noncardiac surgery and add incremental prognostic information to established risk scores that only consider preoperative information.

type: journal paper/review (English)
date of publishing: 19-11-2003
journal title: Journal of the American College of Cardiology
ISSN print: 0735-1097
pages: 1767-76