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Cardiac risk indices in non-cardiac patients

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Keywords

Cardiac risk Indices, non-cardiovascular surgery, scoring

Comments

The use of cardiac risk indices to establish perioperative risk is well established, but their performance in relation to each other is less clear. The authors have evaluated the performance of four of these indices in a large prospective cohort of patients, both individually and in comparison to each other. Their findings suggest that there is little difference between the four indices in predicting adverse cardiac events, and also highlight the relatively low accuracy of the indices which perform moderately better than chance. The study does however, look at a selected population of patients referred for medical consultation prior to elective or urgent noncardiac surgery. There is no mention of what (if any) therapy was instituted at that visit. The same doctors also followed the patients up postoperatively and were free to prescribe therapy they felt was appropriate, both of which may have significantly reduced their risk of cardiac events, and introduced a selection bias. The study does, however, show us that there is still much work to be done to improve these predictors of risk.

Introduction

We constantly try to assess perioperative risk to patients, and a number of guidelines and indices have been published in an attempt to achieve this. The hope is that patients will get both the preoperative and the postoperative care that is appropriate for them and the economic burden of investigating low risk patients will be eased. The American Society of Anesthesiologists' score, despite being a good predictor of death, did not perform so well in predicting cardiac events. This led to the development of multivariate scores like the one published by Goldman in 1977 (see Additional information). These scores have been improved and modified over the years, but it is unclear how they perform in relation to each other. The authors, therefore, decided to compare four scoring systems across a single large prospective surgical population.

Methods

- Prospective observational cohort study
- 2035 patients referred for elective or urgent noncardiac surgery in two Canadian teaching hospitals
- Outcome measures recorded: myocardial infarction, unstable angina, acute pulmonary oedema or death
- Indices assessed: American Society of Anesthesiologists, Goldman, Modified Detsky and the Canadian Cardiovascular Society
- Indices were compared by examining areas under their respective receiver operating curves (ROC)

Results

A total of 2035 patients were enrolled; 1465 at site 1 and 570 at site 2. Cardiac complications occurred in 6.4% of patients. There was a higher incidence of pulmonary oedema at site 2. There were 36 myocardial infarctions, 67 episodes of pulmonary oedema, 27 cases of unstable angina and 48 deaths. Overall, there were no significant differences between the cardiac indices used to predict cardiac complications, with areas under the ROC curve ranging from 0.601 to 0.654. Further analysis revealed that only the Canadian Cardiovascular Society index was useful for predicting the development of unstable angina. The Goldman index was not a good predictor of episodes of pulmonary oedema.

Additional information

Goldman L, Caldera DL, Nussbaum SR, Southwick FS, Krogstad D, Murray B, Burke DS, O'Malley TA, Goroll AH, Caplan CH, Nolan J, Carabello B, Slater BB: **Multifunctional index of cardiac risk in noncardiac surgical procedures.** *N Engl J Med* 1997, **297**:845-850.

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