

Effects of preoperative aspirin on major outcomes in graded high-risk patients undergoing cardiac surgery

Qian Ding^{1,4}, Eric Yuen², Mark W Berguson¹, Hong Liu³, Linong Yao⁴, Jordan Goldhammer¹, Jianzhong Sun¹

[1] Department of Anesthesiology, Thomas Jefferson University Hospital [2] Sidney Kimmel Medical College, Thomas Jefferson University [3] Department of Anesthesiology, University of California Davis Medical Center [4] Tangdu Hospital, Fourth Military Medical University

Introduction

- Among patients with cardiovascular disease, nearly 70% take preventive aspirin.¹
- The benefits of aspirin are greater as a patient's risk of cardiovascular events increases; patients with a lower risk of cardiovascular events derive less of a benefit from aspirin.²
- The effect of aspirin in surgical patients has not yet been investigated, in particular if there is an optimal effect based on operative risk when undergoing cardiac surgery.

Objective

- To determine the effects of preoperative aspirin on major outcomes after cardiac surgery in patients with low, medium, and high predicted operative mortality as determined by the EuroSCORE risk model.

Methods

- Retrospective cohort study.
- 6,514 consecutive patients from two tertiary hospitals between 2001 to 2014 receiving cardiac surgery, including:
 - coronary artery bypass graft (CABG), valve surgery, CABG plus valve surgery, or other cardiac surgery.
- 4,307 patients met inclusion criteria and were divided into three groups based on their risk of operative mortality as calculated by the EuroSCORE model.³
- Patients were further divided into those taking preoperative aspirin or not (control).
- Major outcomes include:
 - major adverse cardiocerebral events (MACE), 30-day mortality, renal failure, ICU stay and readmission.
- ❖ MACEs include perioperative myocardial infarction, heart block, cardiac arrest, permanent stroke, transient ischemic attack (TIA), coma, and renal failure.

Table 1. Effect of aspirin on postoperative outcomes in patients with graded levels of operative risk undergoing cardiac surgery.

EuroSCORE Grade (No.)	Preoperative aspirin		Univariate OR (95% CI)	P	Adjusted OR (95% CI)	P
	Yes	No				
MACE	Outcomes - % (No.)					
All (4307)	9.0% (253)	12.1% (180)	0.718 (0.587 - 0.879)	0.001	0.748 (0.594 - 0.944)	0.01
Low (660)	3.3% (15)	5.3% (11)	0.610 (0.275 - 1.353)	0.22	0.557 (0.224 - 1.385)	0.21
Medium (1523)	5.5% (50)	10.3% (63)	0.503 (0.342 - 0.740)	<0.001	0.666 (0.414 - 1.071)	0.09
High (2124)	13.0% (188)	15.8% (106)	0.796 (0.615 - 1.030)	0.083	0.836 (0.627 - 1.115)	0.22
30-Day Mortality						
All (4307)	3.6% (101)	6.4% (95)	0.546 (0.410 - 0.728)	<0.001	0.570 (0.408 - 0.795)	0
Low (660)	0.2% (1)	2.9% (6)	0.074 (0.009 - 0.620)	0.005	0.077 (0.006 - 0.930)	0.04
Medium (1523)	1.1% (10)	4.8% (29)	0.222 (0.107 - 0.459)	<0.001	0.405 (0.169 - 0.971)	0.04
High (2124)	6.2% (90)	8.9% (60)	0.676 (0.481 - 0.949)	0.023	0.696 (0.475 - 1.019)	0.06

Results

- Among 4,307 patients:
 - 15.3% (660) were low-risk EuroSCORE
 - 35.4% (1,523) were medium-risk EuroSCORE
 - 49.3% (2,124) were high-risk EuroSCORE
- MACE and mortality rates increased significantly from low to medium to high:
 - 3.9% and 1.1% in the low EuroSCORE group, respectively
 - 7.4% and 2.6% in the medium EuroSCORE group, respectively
 - 13.8% and 7.1% in the high EuroSCORE group, respectively.
- Preoperative aspirin use was associated with decreased rates of postoperative MACE and 30-day mortality in patients with various grades of predicted operative mortality undergoing cardiac surgery (Table 1, Figure 1, Figure 2):
 - MACE rates were reduced by 37.7%, 46.6%, 17.7% and 25.6% for patients with low, medium, and high EuroSCORE, and all patients, respectively (low and high EuroSCORE groups did not meet significance)
 - 30-day mortality was significantly reduced by 93.1%, 77.1%, 30.3%, and 43.8% for patients with low, medium, and high EuroSCORE, and all patients, respectively.

Discussion

- Overall, there was a tendency toward unfavorable outcomes as patients' EuroSCOREs increased.
- For patients across a range of EuroSCORE grades undergoing cardiac surgery, preoperative aspirin therapy was associated with a decrease in MACE and mortality.
- The magnitude of the survival benefit was greater in patients with low and medium EuroSCORE than high EuroSCORE, indicating that the benefits of aspirin are strongest in patients with low to medium EuroSCORE undergoing cardiac surgery.

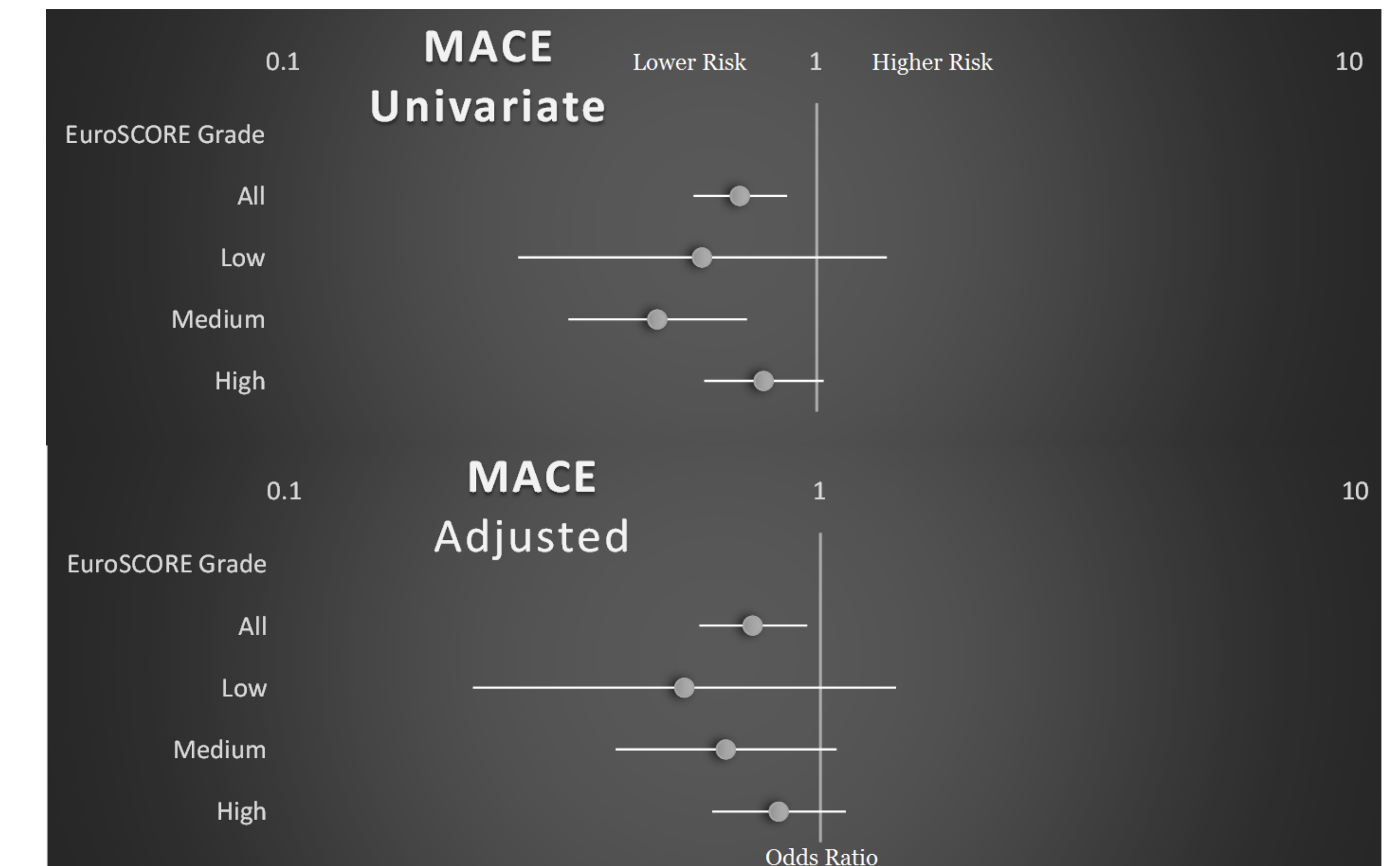


Figure 1. Effects of aspirin on postoperative MACE in patients with low, medium, and high EuroSCORE predicted operative mortality undergoing cardiac surgery.



Figure 2. Effects of aspirin on 30-day mortality in patients with low, medium, and high EuroSCORE predicted operative mortality undergoing cardiac surgery.

References

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