Intraoperative hypotension is associated with acute kidney injury in non-cardiac surgery

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Conclusions

In major non-cardiac surgery, there is an association between intraoperative fall in systolic blood pressure >50% from baseline and postoperative acute kidney injury (AKI).

Background

Postoperative acute kidney injury (AKI) is associated with increased mortality and other postoperative complications.

Objectives

The present study sought to investigate if individually based intraoperative hypotension, and other potential risk factors, including; comorbidities, blood loss, fluid balance etc, were associated with increased risk of perioperative AKI.

Methods

In this observational cohort study of patients undergoing major elective non-cardiac surgery, who required an overnight admission at the postoperative unit, at the Karolinska University Hospital, Stockholm, Sweden during 2012-13 and 2015-16, preoperative risk factors (comorbidities), intraoperative events (hypotension defined as a decrease in systolic blood pressure relative each patient's baseline lasting >5 min) and postoperative data were recorded. Levels of creatinine were measured before surgery and on postoperative day 1 to 3. AKI was defined according to the KDIGO criteria.

Results

Of the final cohort of 470 patients, 127 (27%) developed AKI within 2 postoperative days. Multivariable logistic regression analyses demonstrated that an intraoperative hypotensive event >50% was associated with a more than doubled risk of postoperative AKI (OR, 2.46; 95% CI 1.31-4.62).

Preoperative predictors and odds ratios of AKI in relation to an intraoperative hypotensive event* and the influence of intraoperative blood loss.

Risk factor	OR (unadjusted) (95% CI)	OR (adjusted ^a) (95% CI)	OR (adjusted ^b) (95% CI)
Hypotensive event* >40-≤50%	1.56 (0.98-2.48)	1.64 (1.015-2.66)	1.50 (0.92-2.47)
vs ≤40%	2.38 (1.30-4.36)	2.46 (1.31-4.62)	2.18 (1.14-4.18)
Hypotensive event* >50% vs ≤ 40%			

* Decrease in systolic blood pressure in percent relative to baseline for >5 min.
^a Adjusted for the covariates: gender (male), ASA>2, treated hypertension and pre-operative creatinine >90 μmol/L.
^b Adjusted for the covariates mentioned above and blood loss in quartiles.