TREATMENT AND MORTALITY OF MYOCARDIAL INJURY AFTER NONCARDIAC SURGERY

BACKGROUND

In patients having non-cardiac surgery, cardiovascular events are causes of morbidity and mortality. Myocardial injury following noncardiac surgery (MINS) is characterized by elevated postoperative cardiac troponins with or without evidence of myocardial ischemia. The aim of our study was to assess the prevalence of MINS and its impact on mortality among different surgical procedures.

METHODS

We included 3766 patients who underwent noncardiac surgery and had troponin levels checked within 7 days. Patients with sepsis and pulmonary embolism were excluded. MINS was defined as troponin levels above the 99th percentile of the upper reference limit. We performed multivariate analysis to determine predictors of MINS and in-hospital mortality of different surgeries and impact of different treatment modalities including coronary revascularization.

RESULTS

699 patients (19%) developed MINS. Patients with MINS were older and more likely to have classic cardiovascular risk factors. Hospital mortality was higher and length of stay was longer compared to patients without MINS. They were more likely to receive aspirin, intravenous heparin and to undergo percutaneous coronary intervention (PCI). A higher number of MINS patients (33%) underwent vascular surgery compared to other surgeries. Multivariate analyses showed that, among MINS patients, receiving beta blockers (OR 0.52, 95% CI: 0.32-0.86), having hyperlipidemia (OR 0.57, 95% CI: 0.33-0.99), and undergoing orthopedic surgery (OR 0.35, 95% CI: 0.18-0.69) were predictors of lower overall mortality while undergoing neurosurgery was linked to higher mortality (OR 3.46, 95% CI: 1.55-7.72). Vascular surgery did not significantly impact overall mortality (OR 1.08, 95% CI: 0.50-2.35). PCI was not associated with lower mortality in patients with MINS.

CONCLUSION

Acute myocardial injury after noncardiac surgery is associated with a longer length of stay and higher postoperative mortality. Postoperative monitoring of high-risk patients for the development of myocardial injury is crucial. Prospective studies are needed to clarify the benefit of anti-ischemic medical treatment and coronary revascularization.

Postoperative surveillance and prompt management of myocardial injury after noncardiac surgery is crucial to shorten the length of stay and lower morbidity and mortality

Predictors of In-Hospital Mortality in Patients With MINS

Variable	Multivariate Odds Ratio	95% Confidence Interval	P-value
Age	0.26	0.99 – 1.02	0.26
Perioperative use of Beta blockers	0.52	0.32 – 0.86	0.01
Hyperlipidemia	0.57	0.33 – 0.99	0.004
Orthopedic Surgery	0.35	0.18 – 0.69	0.003
Neurosurgery	3.46	1.55 – 7.72	0.002

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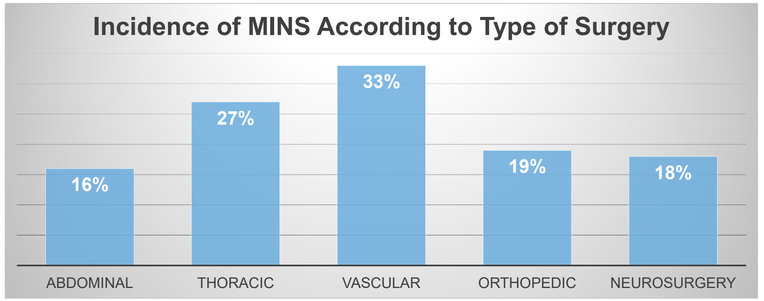
DISCUSSION

Acute myocardial injury after noncardiac surgery (MINS) was previously overlooked due to the absence of ischemic symptoms as a result of postoperative sedation and analgesia. Patients are considered to have MINS if the initial postoperative troponin exceeds the 99th percentile with >20% increase or decrease in subsequent measures.(1)

The pathophysiology of such elevations in cardiac enzymes after noncardiac surgeries is thought to be a multifactorial process interdependent on several factors that lead to myocardial injury including a rise of inflammatory cytokines, surges of cortisol and catecholamines, anemia,(2,3) and hypotension in the perioperative period. Additionally, bouts of postoperative hypertension can disrupt preexisting coronary atherosclerotic plaques,(4,5) along with platelet activation, and vascular endothelial dysfunction that may occur after surgery.

Our study revealed that patients on beta blockers prior to surgery had a lower overall mortality compared to patients that were not on beta blockers prior to surgery. Further investigations are needed to explore the role of beta blockers in lowering the mortality associated with myocardial injury after noncardiac surgery. Surprisingly, no evidence of mortality benefits was found in patients who underwent percutaneous coronary interventions to treat MINS.

Myocardial injury after noncardiac surgery is associated with higher in-hospital mortality and longer length of stay as compared to patients without MINS. More studies including randomized trials are needed to provide clear guidelines on how to manage patients with myocardial injury following noncardiac surgery.



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DISCLOSURE INFORMATION

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