Routine Screening of Preoperative Troponin as a Predictor of Adverse Events in Hip Fracture Patients

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Purpose: The 2024 AHA Guideline for Perioperative Management of Noncardiac Surgery includes troponin as a preoperative biomarker for risk stratification. The guideline acknowledges that preoperative high-sensitivity cardiac troponin can identify myocardial injury and elevated perioperative risk, but there is limited evidence on its ability to predict adverse outcomes in routine preoperative screening. This study evaluates preoperative troponin as a predictor of in-hospital cardiac events, kidney injury, and mortality in patients with hip fracture.

Methods: A retrospective cohort study was conducted of 173 patients with hip fracture at a Level I trauma hospital from January 2022 to July 2024. Perioperative troponin values were routinely collected as part of a hip fracture pathway, and cases were matched to the institutional hip fracture registry. Troponin levels were categorized as normal (<30 ng/L), elevated (30–100 ng/L), and significantly elevated (>100 ng/L). Adverse outcomes were assessed using ICD-10 codes during hospitalization. Associations between troponin and outcomes were evaluated using logistic regression and $\chi 2$ tests, with odds ratios (OR) and 95% confidence intervals (CI).

Results: $\chi 2$ analysis demonstrated a significant association between perioperative troponin and cardiac events ($\chi^2 = 20.53$, $p = 0.000035$) and mortality ($\chi^2 = 12.53$, $p = 0.002$). Logistic regression showed that patients with significantly elevated troponin (>100 ng/L) had 26.2 higher odds of mortality (OR = 26.2; 95% CI: 2.18, 314.46; $p = 0.010$) and 43.67 higher odds of a cardiac event (OR = 43.67; 95% CI: 4.12, 463.30; $p = 0.002$) compared to those with normal troponin. Patients with elevated troponin (30–100 ng/L) also had increased odds of cardiac events (OR = 9.70, $p = 0.067$), although the association did not reach statistical significance. The association between troponin and kidney injury was not statistically significant ($\chi^2 = 2.9429$, $p = 0.230$).

Conclusion: Routine collection of perioperative troponin predicts in-hospital cardiac events and mortality after hip fracture surgery. Additionally, it is imperative to understand the etiology of the elevated troponin—ischemic cardiac (MINS) versus extra-cardiac (e.g., pulmonary embolus or sepsis)—to guide treatment. Further, a larger patient cohort is needed to determine the impact of surgery timing on outcomes; specifically, does any preoperative intervention in these patients improve outcomes or should accelerated time to surgery be the goal?