**Title: Defining prognostically significant perioperative myocardial injury during cardiac surgery using high-sensitivity cardiac Troponin-T – insights from the ERICCA trial**

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**ABSTRACT**

**Introduction**

Evidence-based cut-off thresholds of cardiac troponin elevations for defining prognostically relevant perioperative myocardial injury (PMI) in cardiac surgery need to be established.

**Methods**

In a retrospective analysis of 1612 patients undergoing cardiac surgery as part of the ERICCA trial, we evaluated the associations between baseline (pre-op), and post-op hs-TnT elevation with 1-year all-cause mortality to determine the optimum thresholds in hs-TnT elevation for independently predicting 1-year mortality.

**Results**

1261 patients were included in the final analysis. Baseline (pre-op) hs-TnT elevations >1.2x 99th percentile upper reference limit (URL) were associated with 1-year mortality (adj HR 2.09, 95%CI 1.33-3.28; p=0.001). Post-operative hs-TnT elevations peaked at 6-12h post-surgery and optimal cut-off thresholds (x99th percentile URL) varied with time (6h 100x; 12h 70x; 24h 50x; 48h 35x and 72h 30x). Overall, a cut-off >35x 99th URL at 48 h had the strongest association with 1-year mortality (adj HR 2.58, 95% CI 1.62-4.10, AUC 0.713 CI 0.659-0.766; p<0.001). A similar pattern of optimal cut-off threshold were found in patients (n=537) with normal baseline (pre-op) hs-TnT levels (<99th percentile URL).

**Conclusions**

Both baseline (pre-op) hs-TnT elevations (>1.2x 99th percentile) and post-operative hs-TnT elevations are independently associated with higher 1-year mortality following cardiac surgery. Peak hs-TnT peak elevation was more common at earlier time points (6-12 hrs post op), but later peak (>35x URL elevation at 48 hrs) had the strongest association with 1-year mortality. Much higher early elevation (> 100x URL at 6 hrs and > 70x URL at 12 hrs) is still strongly associated with increased 1-year mortality.

**Figure 1**. Kaplan-Meier survival curve showing that 48-hour hs-TnT with 35x URL elevation post-cardiac surgery was predictive of increased 1-year all-cause mortality

