

## Impact of the period of the day on mortality and major cardiovascular complications after vascular surgeries

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**Introduction:** Patients submitted to arterial vascular surgeries are at a high risk of postoperative cardiac and non-cardiac complications, therefore developing strategies to lower perioperative complications is essential to optimize outcomes for this subgroup. Recent studies have suggested that the period of the day in which surgeries are performed may influence postoperative major cardiovascular complications but there is still no evidence of this association in vascular surgeries.

**Purpose:** Our goal is to evaluate whether the period of the day in which surgeries are performed may influence mortality and cardiovascular outcomes in patients undergoing non-cardiac vascular procedures.

**Methods:** Patients who underwent non-cardiac vascular surgeries between 2012 and 2018 were prospectively included at our cohort. For this analysis, subjects were categorized into two groups: those who underwent surgery in the morning (7am - 12am) and those who underwent surgery in the afternoon/night (12:01pm - 6:59am). The primary endpoints were to compare the incidence of major adverse cardiac events (MACE - acute myocardial infarction, acute heart failure, arrhythmias, and cardiovascular death) and total mortality between morning and afternoon/night surgeries within 30 days and one year. The secondary endpoint was the incidence of perioperative myocardial injury (PMI) in both groups. PMI was defined

as an absolute elevation of high-sensitivity cardiac troponin T (hs-cTnT) concentrations  $\geq 14\text{ng/L}$ . Multivariable analysis using Cox proportional regression (with Hazard Ratio – HR and Confidence Interval – 95% CI) was performed to adjust for confounding variables, including emergency and urgent surgeries.

**Results:** Of 1267 patients included, 1002 (79.1%) underwent vascular surgery in the morning and 265 (20.9%) in the afternoon/night. After adjusting for confounding variables, the incidence of MACE at 30 days was higher among those who underwent surgery in the afternoon/night period (37.4% vs 20.4% – HR 1.43, 95% CI: 1.10–1.85;  $p=0.008$ ). Mortality rates were also elevated in the afternoon/night group (21.5% vs 9.9%, HR 1.59, 95% CI: 1.10–2.29;  $p=0.013$ ). After one-year of follow-up the worst outcomes persisted in patients operated in the afternoon/night: higher incidence of MACE (37.7% vs 21.2%, HR 1.37, 95% CI: 1.06–1.78;  $p=0.017$ ) and mortality (35.8% vs 17.6%, HR 1.72, 95% CI 1.31–2.27;  $p<0.001$ ). There was no significant difference in the incidence of PMI between groups ( $p=0.8$ ).

**Conclusions:** In this group of patients, being operated in the afternoon/night period was independently associated with increased mortality rates and incidence of MACE.

