

# **Pulmonary Artery Catheter Use and Outcomes in Patients with ST-Elevation Myocardial Infarction and Cardiogenic Shock Treated with Impella: A Nationwide Analysis from the United States**

**Introduction:** The role of continuous hemodynamic assessment with pulmonary artery (PA) catheter placement in cardiogenic shock (CS) remains debated. There are limited data exploring the outcomes of ST-elevation myocardial infarction (STEMI) complicated by CS treated with Impella with and without PA catheters. This study aimed to assess the association between PA catheter placement and clinical outcomes in patients with CS secondary to STEMI treated with Impella.

**Methods:** This is a retrospective case-control study of patients hospitalized with STEMI complicated by CS on mechanical circulatory support with Impella comparing outcomes in those treated with and without PA catheters. The primary outcome was in-hospital mortality. Secondary outcomes included complications, hospital length of stay (LOS), and inpatient cost.

**Results:** The total cohort included 11,235 hospitalizations for STEMI complicated by CS between 2016-2019, of which 4,180 (37.2%) received PA catheters. Despite the higher comorbidity burden in the PA catheter group, there was a trend towards improved in-hospital mortality with PA catheter use compared to non-use (41.6% vs. 45.6%,  $p=0.076$ ). After adjusting for baseline characteristics, hospitalizations that included PA catheter use had 18% lower odds of in-hospital mortality (adjusted odds ratio: 0.82, 95% confidence interval: 0.68-0.99,  $p=0.039$ ). However, PA catheters were associated with significantly higher renal, pulmonary, and hematologic complications, longer LOS, and higher cost. There were no significant differences in cardiac and neurologic complications between the two groups.

**Conclusions:** PA catheter use in STEMI patients complicated by CS treated with Impella are associated with reduced in-hospital mortality but higher complication rates. Given the mortality benefit, further research is necessary to optimize PA catheter utilization while reducing complications in STEMI patients with CS.