Differences of In-Hospital Survival based on Time to Catheterization in Non-ST-Elevation Myocardial Infarction Patients with Cardiogenic Shock: Insight from The National Inpatient Sample Database 2016-2019

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Background:

Limited data exist to support a survival benefit of an early invasive strategy in patients with NSTEMI and cardiogenic shock.

Objectives:

To evaluate the effect of an early invasive strategy on in-hospital survival in patients with NSTEMI and cardiogenic shock (NSTEMI-CS).

Methods

We queried the National Inpatient Sample database from 2016-2019 for hospitalizations with a primary diagnosis of NSTEMI and a secondary diagnosis of cardiogenic shock. We defined early invasive strategy (EIS) as coronary angiography/revascularization within 48 hours of admission and conservative strategy as either no coronary angiography or angiography after 48 hours of admission. We assessed the two groups' demographics and in-hospital mortality. In-hospital mortality was adjusted for potential confounders using multivariable logistic regression analysis.

Results:

Out of 66,525 patients admitted for NSTEMI-CS, 47.65% had EIS, while 52.35% had a conservative strategy. Patients in the EIS group were likely younger (68.69 vs. 71.95 years, $p<0.001$), with fewer comorbidities like heart failure, valvular heart disease, chronic kidney

disease, cardiomyopathy, COPD, stroke/TIA, and a lower Elixhauser comorbidity index. However, the EIS group received more invasive support with balloon pumps, left ventricular assist devices, and mechanical ventilation than the conservative strategy group. In-hospital mortality was statistically lower in EIS compared to the conservative strategy in univariate analysis (24.83% vs. 36.24%, OR: 0.58, 95% CI: 0.54-0.63, p<0.001), which persisted when adjusted for the difference in comorbidities and treatment (adjusted OR: 0.65, 95% CI: 0.59-0.71, p<0.001). On Subgroup analysis, we didn't find any difference in unadjusted or adjusted in-hospital mortality in a patient undergoing coronary catheterization within 24 hours vs. 24-48 hours (adjusted OR: 0.99, 95% CI: 0.87-1.12, p=0.84). We also found a lower unadjusted and adjusted in-hospital mortality in patients undergoing coronary catheterization after 48 hours compared to no catheterization (adjusted OR: 0.29, 95% CI: 0.26-0.34, p<0.001) (Figure 1).

Conclusion:

An early invasive strategy was associated with lower in-hospital mortality in patients with NSTEMI-CS. However, we didn't find any difference in in-hospital mortality in cardiac catheterization within 24 vs. 24-48 hours. Further study is required to understand if catheterization within 24 hours has a long-term survival benefit compared to 24-48 hours.

Keywords: NSTEMI, Cardiogenic Shock, In-hospital Mortality, Database Factual

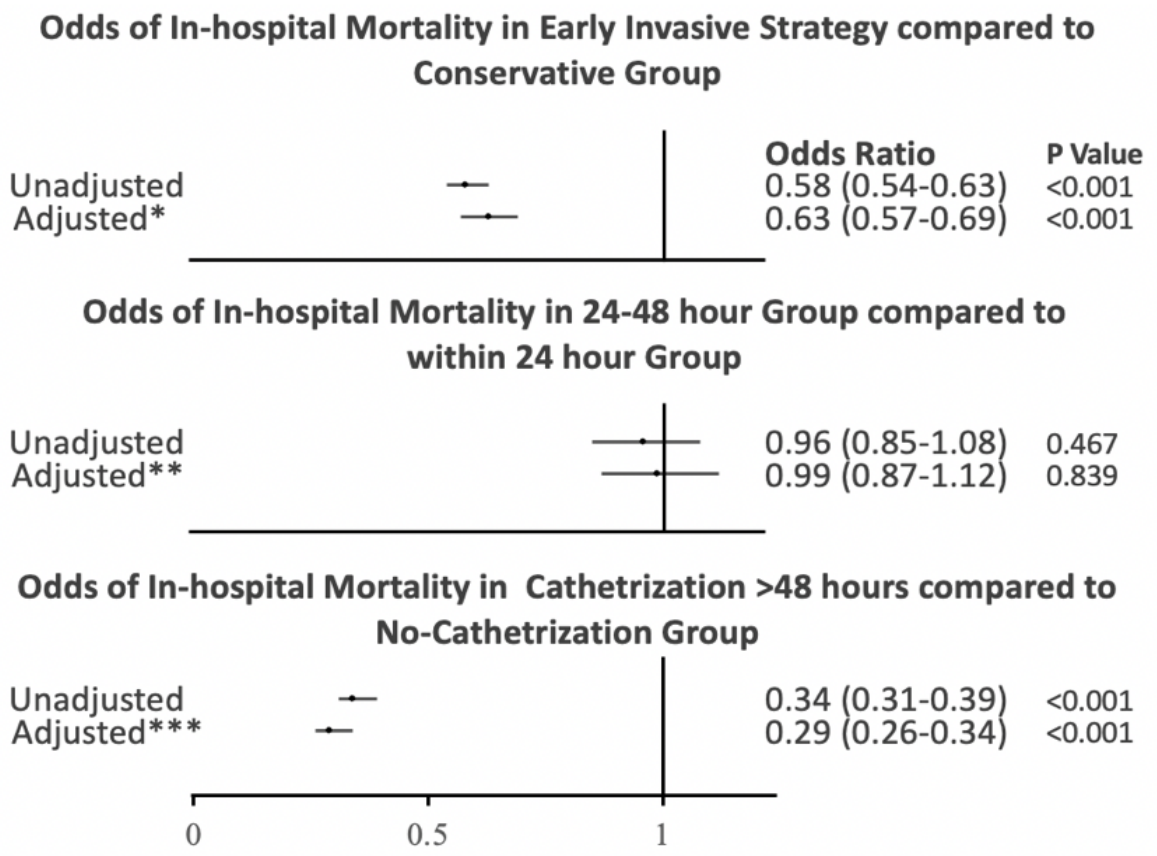

Figure 1: Unadjusted and adjusted odds ratios of outcomes of In-hospital Mortality.

* Adjusted for: Age, race, income, primary payer, hospital region, hospital bed size, hospital location, balloon pump, left ventricular assist device, mechanical ventilation, CABG procedure, COPD, history of stroke/TIA, coronary artery disease, history of coronary artery bypass graft, heart failure, smoking, hyperlipidemia, obesity, valvular heart disease, diabetes, cardiomyopathy, acute kidney injury, Elixhauser comorbidity mortality index, obesity, alcohol use, and chronic kidney disease stage 3 or greater.

** Adjusted for: Income, hospital region, balloon pump, mechanical ventilation, CABG procedure, COPD, history of stroke/TIA, heart failure, COPD, heart failure, smoking, hyperlipidemia, obesity, valvular heart disease, hypertension and diabetes.

*** Adjusted for: Age, race, hospital bed size, hospital location, hospital teaching status, Sex, balloon pump, left ventricular assist device, mechanical ventilation, CABG procedure, coronary artery disease, COPD, history of stent, heart failure, smoking, hyperlipidemia, obesity, valvular heart disease, chronic kidney disease stage 3 or greater, peripheral vascular disease, hypertension, diabetes, cardiomyopathy, new hemodialysis and Elixhauser comorbidity mortality index.