Predictors of in-hospital mortality in STEMI patients complicated by cardiogenic shock treated with primary percutaneous coronary intervention

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Topic(s):
Acute Coronary Syndromes: Shock

Citation:

Introduction: Cardiogenic shock (CS) is an uncommon complex syndrome in patients (pts) with acute myocardial infarction (AMI). However, it remains the most serious complication and the most common cause of in-hospital mortality, with mortality rates ranging from 40% to 60%. The majority of pts are thought to develop CS after admission (late CS), but the incidence in a contemporary STEMI cohort admitted for percutaneous coronary intervention (PCI) remains unknown.

Objective: The aim of the present study was to evaluate pts with STEMI and cardiogenic shock undergoing pPCI, in order to establish the timing of CS onset, mortality rates and predictors of in-hospital mortality.

Methods: The records of 1679 STEMI pts admitted, consecutively, in our coronary care unit during six years were analysed retrospectively. Of this pts, 137 (8%) developed CS based on clinical criteria. Univariate and multivariate logistic regression analyses were used to identify independent predictors of in-hospital mortality. Primary endpoint was the occurrence of death at 30 days and 1 year; follow-up was completed in 100% of patients. Statistical analysis was performed using SPSS 20.0.

Results: The sample was formed by 90 (65.7%) men and 47 (34.3%) women, with mean age of 67±15 years. The incidence of CS was 8%. The majority of this pts (48%) were transferred from a non-PCI centre, 27% were rescued by an emergency medical system and 26% were admitted directly at a PCI centre. Around of 39% of pts had to be resuscitated before coronary intervention. Regarding the timing of CS onset, 66% of pts had CS on admission and 34% developed late CS. The left anterior descending artery was the most affected artery (47%), and 55% of the patients had multivessel disease. All-cause in-hospital and 1 year mortality was 45% and 53%, respectively. A multivariate analysis identified age > 75 (HR 1.1, p=0.002), eGFR < 60 ml/min/1.73 m2 (HR 2.2, p=0.02), left ventricular dysfunction (LVEF<40%) (HR 2.1, p=0.027), resuscitation before PCI (HR 1.2, p=0.045), and Intra-Aortic Balloon Pump (IABP) implantation after PCI (HR 4.4, p=0.026) as independent predictors of in-hospital mortality.

Conclusion: Despite the therapeutic advances and early revascularization have substantially improved the survival of pts with STEMI and CS, the in-hospital mortality is still significant. This study identified age, acute renal failure, left ventricular dysfunction, resuscitation before PCI, and IABP implantation after PCI as independent predictors of in-hospital mortality in patients with cardiogenic shock due to AMI. Consequently, only the timing of IABP insertion was the only modifiable factor predicting in-hospital mortality in our study, and its implantation before PCI can be considered to improve the outcome of these patients. These results should motivate the search for potentially modifiable factors that can lead to better results in the prognosis of these patients.