

Cardiogenic shock without hypotension in acute myocardial infarction

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Introduction: Cardiogenic Shock (CS) complicates 10% of Acute Myocardial Infarction (AMI), being the main cause for intra-hospital death in these patients. Although early revascularization has contributed to increase survival, mortality still presents high, being 40-50%. CS usually presents with inadequate cardiac output and persistent hypotension. However, after large AMI, peripheral hypoperfusion can occur with sustained or borderline systolic blood pressure (SBP).

Purpose: Characterize patients (pts) with CS after AMI in the absence of hypotension (defined as SBP < 90 mmHg), and assess impact in mortality.

Methods: We evaluated 528 pts presenting with CS in context of AMI. We considered 2 groups: Group 1 - Pts who had SBP \geq 90 mmHg, without any inotropic drug or assist device and 2 - Pts with SBP < 90 mmHg. We registered age, gender, co-morbidities, presentation, coronary anatomy and treatment strategies. We evaluated in-hospital mortality and complications: re-infarction, mechanical complications, high-grade atrioventricular block (AVB), sustained ventricular tachycardia, atrial fibrillation, resuscitated cardiac arrest and stroke.

Results: AMI presenting as Cardiogenic Shock without hypotension (CSWH) was found in 51% of pts (n = 272), of whom 69% were male. They were younger (between age of 45-64 years old in 34% of cases vs 25%, p = 0.040) and had higher body mass index (27.3 ± 4.5 vs 26 ± 4.1 , p = 0.001). Hypertension was a similarly distributed comorbidity. In group 1, pts were previously more frequently under beta blocker medication (25.2% vs 17.7%, p = 0.047). In this group, mean left ventricular (LV) ejection fraction was $39 \pm 13\%$, a quarter having severely depressed LV function (< 30%). Although STEMI was the most common presentation in both sets (73.5% vs 87.1%, p < 0.001), NSTEMI was more prevalent in CSWH (23.9% vs 12.1%, p < 0.001). Those pts presented more, at admission, with dyspnea (14.9% vs 5.5%, p < 0.001) and in sinus rhythm (81.9% vs 69%, p < 0.001). In this group, ICU admission was less frequent (19.4% vs 27.2%, p = 0.036), and only about half of pts were medicated with inotropic drugs (vs 78.1%, p < 0.001). However, difference in intra-aortic balloon use wasn't found. CSWH presented with multi-vessel disease in 63.8% of pts, being LAD more frequently the culprit vessel (42.4% vs 30.7%, p = 0.030), but fewer left main artery (LM) (4.2% vs 14.0%, p = 0.003). Group 1 had fewer prevalence of vessel occlusion, which was particularly true for LM (3.8% vs 11.5%, p = 0.015) and circumflex (12.4% vs 20.7%, p = 0.047), and were less often submitted to revascularization. Group 1 had fewer AVB (9.8% vs 22.4%, p < 0.001). Rates of other complications were similar. In-hospital mortality was higher in classic CS (33.1% vs 43.8%, p = 0.012).

Conclusion: Cardiogenic Shock without hypotension was found in about half of pts with CS due to AMI. A majority of these were younger and globally had a less severe event and complications. Even though CSWH was associated with one third of in-hospital mortality, it was lower than in pts with hypotension.