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**Feasibility and safety of Impella mechanical circulatory support in different clinical scenarios: a single-centre experience**

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**Background:** The Impella (Abiomed, Danvers, MA) mechanical circulatory support is a catheter-based axial-flow pump. It reduces left ventricular (LV) stroke work and myocardial oxygen demand while increasing systemic and coronary perfusion in the setting of cardiogenic shock (CS), and it provides hemodynamic support during high-risk percutaneous coronary intervention (PCI).

**Purpose:** To evaluate the outcomes of Impella-supported patients in the context of CS and protected-PCI.

**Methods:** This single-center registry includes all patients implanted with Impella device at our institution between February 2013 and June 2018. Indications for Impella support were CS (hypotension despite adequate filling status with signs of hypoperfusion) and protected-PCI (prophylactic hemodynamic support during non-emergent high-risk PCI).

**Results:** A total of 145 patients were implanted with Impella: 130 (89.7%) for CS and 15 (10.3%) for protected-PCI. Among CS patients, mean age was 61.6±12.9, 79.2% males. The prevalence of chronic heart failure (HF) was 26.1%, prior myocardial infarction (MI) 29% and myocardial revascularization 36.6%, chronic kidney disease (CKD) 18.3%. Among protected PCI patients, mean age was 73.4±8.7 years, 86.7% males. The prevalence of HF was 85.7%, prior MI 42.9%, myocardial revascularization 35.7%, CKD 57.1%. In CS group, the indications for Impella implantation were myocarditis in 8 (6.2%) patients, acute coronary syndromes in 77 (59.2%), periprocedural ventricular tachycardia ablation CS in 10 (7.7%), decompensated heart failure in 26.9%. Out of hospital cardiac arrest occurred in 35 (30.4%) patients, INTERMACS I class in 70 (59.3%), mean arterial pressure was 65.4±18.4 mmHg, serum lactate 6.7±5.5 mmol/l, at least 1 inotropic agent use in 73 (66.4%), mean LV EF 21.4±11.7%, right ventricular dysfunction in 53 (48.6%). The rate of device-related complications was not negligible in CS group: 18 (14.5%) patients had limb ischemia and vascular surgery was required in 14, 17 (14.3%) had access-site bleeding. A total of 42 (33.3%) had haemolysis, and 67 (56.8%) acute kidney injury (AKI), half of whom requiring renal replacement therapy. Escalation to other therapies was necessary in 43 cases. Conversely, in the protected-PCI group a low rate of AKI (n=4, 28.6%) and acute limb ischemia (n=1, 7.1%) was observed, whereas no cases of haemolysis nor need of escalation therapy were recorded. Mean Impella support was 135.5±167.21 days for CS group, 60.6±80 for protected-PCI group. Survival at 30 days was 60.33% for CS group and 92.9% for protected-PCI group. One-year all-cause death was 50% for CS group and 13.3% for protected-PCI group.

**Conclusion:** Mechanical circulatory support with Impella is associated with good outcomes and reasonable rates of complications in the protected-PCI group, whereas less favorable results were observed in CS population probably due to the greater severity of clinical presentation.