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Single Center Study of the Impella Pump

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Background

Impella® is a percutaneously inserted ventricular assist device. Its use increased from 11 devices placed in 2016 to 39 in 2019 at Valley Baptist Medical Center (VBMC). We review the anticoagulation options, side effects and mortality.

Methods

We conduct a retrospective chart review of all patients placed on Impella from January 1, 2016 to March 31, 2020 admitted to VBMC. A final sample of 107 patients was collected. Descriptive statistics were used to assess the distribution of variables; continuous variables summarized as mean values with standard deviations and categorical variables summarized as counts and percentages.

Results

The indication for Impella was protected percutaneous coronary intervention (PCI) (71%, of which 18.4% was intervention on a previous coronary artery bypass graft, CABG), cardiogenic shock (17.7%) or coronary angiogram prior to CABG (11.3%). Average duration of being placed on support was 1.3±1.8 days.

Periprocedural anticoagulants administered by cardiologist were heparin (H), bivalirudin (B), or both. Some patients received enoxaparin (E) [dosed as per ACS protocol] for ≥24hrs before the procedure. Anticoagulation groups are H (55.1%), B (22.4%), H+B (7.5%), E+H (3.7%), E+B (8.4%), and none (2.8%). Observed side effects were acute bleeding (18.7%) with hemoglobin ≤7 mg/dl by group is 10.1% vs 20.8% vs 37.5% vs 50% vs 33.3 respectively (p=0.06), femoral pseudoaneurysm (2.8%) and retroperitoneal bleed (0.9%). Average aPTT was 70-140 seconds in the heparin group, ACT (measured in 9.3% of patients only) was 275±212.4, fibrinogen (measured in 12.1% of patients only) was 356±125.8.

Death within a month (32/107) occurred when indication was cardiogenic shock (83.3%) versus protected PCI (28.9%) (p=0.00018).

Conclusion

In agreeance with the manufacturer's recommendation, the lowest risk of bleeding is observed with heparin (dosing: weight-based) only. Further clinical studies required for having a standardized protocol for anticoagulation with dosing and duration of therapy.