**Differential survival benefit of IABPs and PVADs by procedural timing and clinical indication**

**Background**: Temporary mechanical circulatory support with intra-aortic balloon pumps (IABPs) and percutaneous ventricular assist devices (PVADs) are used to support patients in cardiogenic shock (CS) and with acute myocardial infarction (AMI). There is limited data concerning the optimal timing of placement of IABPs and PVADs, and outcomes based upon indication for placement.

**Methods**: 98,381 adult patients who received an IABP or PVAD between 2005 and 2011 for CS or AMI and for whom information on procedural timing was available were identified in the National Inpatient Sample. We compared in-hospital mortality between PVAD and IABP by timing of placement and indication for placement.

**Results:** IABP and PVAD were initiated for the indications of CS (n = 44,217 and 281 respectively), and AMI without CS (n = 53622 and 262 respectively). Patients with IABP and PVAD were of similar age (65.1 years vs. 65.3 years, p = 0.72) and similar proportion of female patients (28.5% vs. 32.5%, p = 0.057), but had a higher number of comorbidities (13.2 vs. 10.2, p < 0.001). The median hospital length of stay for both IABP and PVAD patients was 8 days, and the majority of IABPs and PVADs were placed on the first day of hospitalization (60.0% vs. 51.0%; range: 0-197 days vs. 0-82 days). In patients diagnosed with CS, IABP patients had increased mortality compared to PVAD patients when support was placed on hospital day 0 or 1 (30.2% vs. 20.5%, p = 0.01). This difference was not present when support was placed > 1 week post admission (33.8% vs. 34.1%, p = 0.96). In patients diagnosed with AMI without CS, IABP patients had decreased mortality compared to PVAD patients when placed on hospital day 0 or 1 (10.7% vs. 32.9%, p = 0.0001), and difference also disappeared when the devices were placed > 1 week post admission (26.8% vs. 27.5%, p = 0.91).

**Conclusions**: The survival benefit of IABPs versus PVADs is influenced by the timing of the procedure and the clinical indication for placement.