**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 and patients undergoing high risk percutaneous coronary interventions. There is limited data comparing the optimal timing and practice patterns between IABPs and PVADs.

**Methods**: 120,452 adult patients who received an IABP or PVAD between 2005 and 2011 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 indication and distinguished between early (hospital day 0 or 1) and late circulatory support (>7 days post-admission).

**Results:** IABP and PVAD was initiated for cardiogenic shock (CS, 39.1% vs. 29.7%), acute myocardial infarction (AMI) without CS (37.8% vs. 27.5%), or percutaneous coronary intervention (PCI) without AMI or CS (3.4% vs. 33.3%). Median hospital length of stay for both IABP and PVAD patients was 8 days (range: 0-261 days vs. 0-81 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 placed early during admission (30.2% vs. 20.5%, p = 0.0111). This difference was not present in late circulatory support (33.8% vs. 34.1%, p = 0.9604). In patients diagnosed with AMI without CS, IABP patients had decreased mortality compared to PVAD patients when placed early during admission (10.7% vs. 32.9%, p = 0.0001), although this difference also diminished when the devices were placed later in the hospitalization (26.8% vs. 27.5%, p = 0.9147). Finally, in patients who received PCI without a diagnosis of AMI or CS, IABP patients had consistently decreased mortality compared to PVAD patients irrespective of device timing (early, 6.4% vs. 25.8%, p = 0.0001; late, 10.9% vs. 35.7%, p = 0.0005).

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