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

**Background**: Temporary mechanical circulatory support with intra-aortic balloon bumps (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**: Adult patients who received an intra-aortic balloon bump (IABP) or percutaneous ventricular assist device (PVAD) between 2005 and 2011 and for whom information on procedural timing was available were identified in the National Inpatient Sample using ICD-9. We compared in-hospital mortality between PVAD and IABP by indication for circulatory support and distinguished between early circulatory support (on hospital day 0 or 1) and late circulatory support (>7 days post-admission).

**Results:**

Circulatory support with IABP and PVADs was initiated for cardiogenic shock (39.1% vs. 29.7%), acute myocardial infarction (AMI) without cardiogenic shock (37.8% vs. 27.5%), or percutaneous coronary intervention (PCI) without either AMI or cardiogenic shock (3.4% vs. 33.3%). Median hospital length of stay for both IABP and PVAD patients was 8 days (range: 0-261 days vs. 8 days; range: 0-81 days), and the vast majority of IABPs and PVADs were placed on the first day of hospitalization (XX %, range: 0-197 days vs. XX%, 0-82 days). For patients with PVAD placed for cardiogenic shock, delayed circulatory support had increased mortality compared to early circulatory support (20.5% vs. 34.1%, < calculate p value>), however there was no such difference for patients with IABP placed for cardiogenic shock (30.2% vs. 33.8%, < calculate p value>). On the contrary, in patients diagnosed with AMI without cardiogenic shock, early IABP placement had decreased mortality compared to late IABP placement (10.7% vs. 26.8%, < calculate p value>), however there was no such difference for patients with PVAD placement in the setting of AMI (32.9% vs. 27.5%, <calculate p value>). In patients who received PCI without AMI or cardiogenic shock, early circulatory support had decreased mortality for both IABP (6.4% vs. 10.9%, <calculate p value>) and PVAD (25.8% vs. 35.7%), and patients with IABP had consistently lower mortality compared to patients with PVAD(≤ 1 day post-admission, 6.4% vs. 25.8%, p-value = 0.0001; >7 days post-admission, 10.9% vs. 35.7%, p-value = 0.0005).

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