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Characteristics And Outcomes Of Patients Supported With Impella Percutaneous VAD Device At Pediatric Institutions: Action Collaborative Experience.

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Abstract:
Purpose We describe Advanced Cardiac Therapies Improving Outcomes Network (ACTION) pediatric multicenter experience with Impella® percutaneous ventricular assist device (PVAD) support for management of cardiogenic shock.
Methods Retrospective review of patients supported with a Impella PVAD 15 pediatric centers participating in ACTION Collaborative from 10/2014 to 09/2021. Only patients supported with Impella PVAD alone were included. Demographics, device, and outcomes data was reviewed and reported using descriptive statistics.
Results Total of 47 patients met the inclusion criteria. Median age was 16.1 years (range 6.38,34.4), weight 65.0 kg (range 29.6,124), and BSA 1.75 m^2 (range 1.05,2.52). PVAD was used most often for transplant graft dysfunction (40.4%) followed by dilated cardiomyopathy/myocarditis (31.9%), end stage congenital heart disease (14.9%) and others (12.5%). INTERMACS Profile 1 was reported in 42.6%, Profile 2 in 42.6%, and Profile 3 in 10.6%. Strategies for support included bridge to recovery (55.3%), bridge to transplant (23.4%) and bridge to decision (19.1%). Ten patients (21.3%) were bridged to durable VAD support. Impella CP was used in 64% cases, 5.0 in 18% and 5.5 in 18%. Nine (19%) patients had >1 device implanted. Anticoagulation was achieved with unfractioned heparin in 91% and a direct thrombin inhibitors in 9%. Median duration of support was 5.5 days (range 1,116) on CP device, 27 days (range 6,64) on 5.5 device and 21.5 days (range 8,143) on 5.0 device. Most common device complications included hemolysis (39.0%), major bleeding (15.3%), device malfunction (13.6%), renal failure (8.5%), arterial non-CNS thrombus (5.1%), and cardiac arrhythmia (3.2%). There were no neurological events. A positive clinical outcome was achieved in 85% of patients (77% survived to explant; 8% alive on device).
Conclusion This study reports the Impella PVAD pediatric multi center experience for support of cardiogenic shock, with overall low morbidity and satisfactory survival benefit for a high-risk population. This device should be considered as part of the mechanical support armamentarium used in management of cardiogenic shock. Further investigation into optimal patient selection and support environment is needed to optimize its use in pediatric institutions and minimize adverse events.

Author Disclosure Information:

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