Biventricular versus monventricular mechanical circulatory assistance in children

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Experience in Pediatric Mechanical Circulatory Support has shown that prognosis is worse in biventricular (biVAD) than LV (LVAD) support.

Objectives: To assess outcomes of children who had biVAD compared to LVAD in a single center experience.

Material and methods: From 2005 to 2014, 27 patients aged <18years, were implanted with Ventricular Assist Device. Their clinical and biological data, echocardiographic records and outcomes were reviewed. Patients were divided in biVAD (21 cases) and LVAD (6 cases) groups.

Results: Thirteen females and 14 males, aged 4 ± 4.8years: 0.29 to 16.1 years (median 1.4) received a left ventricular (n= 6) or biventricular (n= 21) support, for cardiogenic shock or cardiac arrest in 8, or uncontrolled low cardiac output in 19, due to cardiomyopathy (24), acute myocarditis (2) or ischemic cardiomyopathy (1). Age at VAD was lower in LVAD than BiVAD (median : 0.9 vs 2.5y). Duration of support was 46 ± 44days: 3 to 182 days (median 35: 31days in biVAD, 65days in LVAD. Four patients less than 1 year, experienced a severe stroke (14%), 6 died on support (22%), of whom 5 were < 1 year, 3 were weaned off support (11%), 18 were transplanted (67%). Mortality was 19% in biVAD vs 33% in LVAD. Survival to support was 78%. Death decreased from 28.5% in 2005-09 to 15.4% in 2010-14 (p= 0.22), significant stroke from 28.5% to none (p= 0.05) and infections from 71.4% to 30.8% (p= 0.02). Significant strike on VAD was more frequent in LVAD (33%) than in biVAD (9%), p= 0.1. Infections rate was 33% in LVAD compared to 57% in biVAD (p= 0.5).

Conclusion: Survival to mechanical circulatory support in children increased over time despite biVAD still being the most frequently used mode. Stroke and mortality was lower in biVAD than LVAD groups.