

Mechanical circulatory support in pediatric age: experience, outcomes and morbidity

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Introduction:

Concerning mechanical circulatory support (MCS) in pediatric age, device choice and timing of implantation rely on patient's characteristics and device's risk profile.

The aim of this study is to analyze patient's characteristics, outcomes and morbidity associated to different MCS modalities.

Methods:

Retrospective patient data analysis, who needed MCS between 2002 and 2018.

Results:

Between 2002 and 2018, 20 patients needed MCS and 22 devices were used. Eleven were on ECMO, eight on pulsatile paracorporeal ventricular assist device (PPVAD) and three on paracorporeal continuous flow ventricular assist device (PCFVAD) with magnetic levitated pump system.

Group A (ECMO): medium age of 4 years, minimum weight 3,2Kg. ECMO was initiated for failure to leave bypass after cardiac surgery (4), refractory postoperative arrhythmia (3), cardiogenic shock (4) in dilated cardiomyopathies (DCM) (2) and congenital heart disease (2). Left ventricular decompression was needed in 2.

During a mean of 7,5 days in MCS, 36% experienced major bleeding demanding surgical revision, 9% cannula associated thrombus and 9% neurological events. Renal substitution therapy (RST) was needed in 4. Death occurred in 3 patients (27%), upgrading to another form of MCS in 2 and 5 were weaned off (45%).

Group B (PPVAD): 8 DCM patients (pedimacs 1 and 2), medium age 1,4 years, minimum weight 3,5Kg. PPVAD was used as "bridge to transplant" in all. Mean support time was 71,7 days (7 to 125 days) during which 75% experienced major infection, 37,5% major bleeding, 12,5% device malfunction and 37,5% neurological events. Two needed RST. Half were successfully transplanted.

Group C (PCFVAD): 3 DCM patients (pedimacs 1 and 2), medium age 11,3 years, minimum weight 17,7Kg. PCFVAD was used as "bridge to transplant" in all. Mean support time was 14,6 days (11 to 20 days) during which 66,6% had major bleeding and 33,3% had neurologic events. One patient needed RST. All patients were successfully transplanted.

Conclusion:

MCS defined as short term, can be used for longer periods with an acceptable risk profile. The main complications are bleeding and thrombosis related events. The outcomes and prognosis are highly influenced by patient's characteristics and status at time of implantation.