

MP1-19

Experience with Berlin-heart Excor® devices in children in south of France

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Background: Techniques for long-term circulatory support in pediatrics are limited and the number of implantations remains low when compared to the adult population. Description and analysis of follow-up data are essential in order to progress on indications, technical difficulties and management of complications.

Methods: A retrospective observational multicenter study was conducted in the south of France. All 3 university hospitals (Bordeaux, Lyon, Marseille) performing circulatory support in children participated. All children (< 18 years of age) who needed a long-term ventricular assist device support were included. Only the Berlin Heart EXCOR® was used. We sought to analyze the morbidity and mortality data in this population and identify risk factors for complications and death.

Results: 45 patients were included. Median age at time of support was 16 months (range: 3-156) , 49% were males. The predominant indication for circulatory support was cardiomyopathy (97,2%). In 53% the assist device was biventricular, the remaining had left assist device. 35,6% patients had extracorporeal membrane oxygenation-support before implantation of the Berlin-heart Excor. The total amount of days of circulatory support for the whole group reached 2272 days, with a mean duration of 34 days (range: 0 - 199 days). 62% of patients were transplanted, 11% were weaned and 27% died. Complications occurred in 82,2% of the patients and were mainly infections (48.9%), severe bleeding (35.8%), stroke (35.6%) and non-neurologic thromboembolic events (37.8%). Preimplantation disorders of consciousness were significantly associated with the occurrence of stroke (p <0.005, log rank test). The number of complications tended to increase with the ventricular assist duration, initial value of BNP (or pro-BNP) and the presence of initial hepatic dysfunction. Male gender was also significantly associated with higher mortality or severe complications (composite criteria - p <0.005 - Fischer Test).

Conclusion: Despite the severity of the underlying disease, the length of the support and the high number of serious complications, the survival was encouraging (73%) in our population and comparable to other published series. Better control of infectious events and more homogenous anti-coagulation protocols are required. More detailed follow-up, in particular with regards to long-term neurological development is required.