

Survival of Children after Weaning from Mechanical Circulatory Support

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Introduction

Since myocardial recovery during ventricular assist device support is infrequently observed in general, clinical data following weaning in children is even more limited at present.

Thus, we aimed to evaluate the outcome of all patients weaned from the Berlin Heart EXCOR Pediatric Ventricular Assist Device (VAD) at our institution.

Methods

A total of 125 children received implantation of the Berlin Heart EXCOR pediatric VAD at our institution between 1994 and 2014. The study group consisted of all 20 children (16%), (13 female, 7 male) who have been weaned from VAD support. Event free survival was defined as freedom from death or transplantation.

Seven children suffered from cardiomyopathy, seven presented with myocarditis, further indications included congenital heart disease and status post cardiac transplantation. Fourteen patients received a left ventricular assist device, one patient a right ventricular assist device, and five patients a biventricular assist device. The median age at implantation was 0.7 years (range 0–14), the median duration of support was 32 days (6–124).

Results

At present 16 of the 20 children who could be weaned are alive. One patient who was transplanted two months after weaning died from chronic graft failure. Three children died after 2.5, 3.3, and 15.5 years, respectively. Causes of death included bronchiolitis in one child, two patients died suddenly of unknown cause. The median interval between VAD explantation and follow-up was 9.0 years (range 1–18). The Kaplan-Meier analysis showed an event-free survival rate after 5, 10 and 15 years of 83.7 %, respectively. Mean survival was 14.3 years (CI 11.5-17.1). At follow-up, echocardiographic median ejection fraction (EF) was 53.0 % (range 28–64). There was no significant difference between the median EF at discharge following weaning and at follow-up ($p = 0.25$).

Conclusions

The survival analysis of our cohort reveals very good outcome in general. Survival after 5, 10 and 15 years was superior in children weaned from VAD support compared to children after orthotopic heart transplantation (ISHLT registry data, 2015). Moreover, cardiac function is remarkably stable over years.