Early results and long-term follow-up after mechanical circulatory support (MCS) with a variety of devices in children


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Introduction
MCS is increasingly used in children when conventional medical treatment fails. New pediatric sized devices have been developed in the last several years. Nevertheless, poor overall survival and long-term outcome have been observed. We report our early and late outcome as well as the health-related quality of life (HRQoL).

Methods
Between 2001 and 7/2012, a total of 51 children, median age 3 months (range 4d–17y), underwent 53 MCS courses with a median supporting time of 3 days (range 1-248).

MCS (9 different systems) included Extracorporeal Membrane Oxygenation (v-v-ECMO, n=2), Extracorporeal Life Support (v-a-ECLS n=33), and the use of Ventricular Assist Devices (VAD n=9). In some patients, we took a switch from one system to the other: v-v-ECMO/v-a-ECLS (n=6) and v-a-ECLS/VAD (n=3).

Diagnosis: Myocarditis n=5, Cardiomyopathy n=5, in n=33 weaning from bypass failed after surgery, 6 others.

For HRQoL, all 21 long-term survivors answered standardized questionnaires (Kiddy-Kindl®, Kiddo-Kindl®, SF36®) and were graded according to age into 5 groups: 0-3 years (n=6), 4-7 years (n=6), 8-12 years (n=2) and patients older than 13 years (n=6).

Results
51 children underwent 53 MCS courses. 64% survived (55% weaned, 9% transplanted). Two weaned patients underwent later transplantation (after 4 and 10 months respectively). Despite successful weaning, 9 died over the course of hospitalization and 25 (47%) were discharged home, 4 dying later.

Despite individual cases with motric problems or cognitive delay, HRQoL showed a favorable outcome for selected patients regarding their social and psychomotoric development and their morbidity in the view of their parents (patients younger than 12 years), and a most favorable outcome in their own sensation (patients older than 13 years).

Conclusion
Overall, long-term survival and QoL is satisfactory. Nevertheless, a long-term follow-up program of these severely ill children should be structured to detect early disorders to offer individual support.