Chronological change of left ventricular systolic function in children with fulminant myocarditis supported on ECMO

Ono H. (1), Hayashi T. (1), Kato H. (1)
National Center for Child Health and Development, Tokyo, Japan

Introduction: Aggressive hemodynamic support including extracorporeal membranous oxygenation (ECMO) would be beneficial for patients with fulminant myocarditis in the acute phase, serving as a bridge to the recovery of LV function. However, few studies reported the optimal duration of ECMO support for children with fulminant myocarditis. We aimed to describe the time course of LV ejection fraction (EF) recovery in children with fulminant myocarditis supported on ECMO. Methods: We identified 15 children supported on ECMO out of 21 children with fulminant myocarditis admitted to the pediatric intensive care unit at our institution from December 2008 to December 2014. Of these, 13 patients were successfully weaned from ECMO support without further treatment with ventricular assist device implantation or heart transplantation, and included in this study. The medical records of the patients were retrospectively reviewed. Results: The median age of the patients was 5 years (range, 4 days-11 years), and the median duration of ECMO support was 8 days (range, 5-14 days). Indication for ECMO support was severe LV systolic dysfunction in 10 patients (group A, LVEF 28 ± 13%), and 3 patients required ECMO support because of uncontrollable arrhythmia despite the preserved LVEF prior to ECMO introduction (group B, LVEF 47 ± 8 %). Overall, LVEF was 32 ± 15% prior to ECMO introduction, and decreased drastically after the initiation of ECMO support. The recovery of LVEF started 4.5 ± 1.5 days (range, 1-7 days) after the ECMO introduction. The patients restored LVEF of 60% 14 ± 9 days (range, 5-38 days) after the ECMO introduction. Children in group A showed later recovery of LVEF (16 vs 9 days) and longer duration of ECMO support (9 vs 6 days) than those in group B, although the differences did not reach statistical significance. Conclusions: In children with fulminant myocarditis successfully weaned from ECMO, LV systolic function started to improve within a week after ECMO initiation and was restored to normal mostly in a month. Further treatment with ventricular assist device implantation or heart transplantation should be considered in patients without an evidence of LVEF recovery after 1 week’s ECMO support.