

PRE-HOSPITAL IMPLANTATION OF EXTRACORPOREAL LIFE SUPPORT FOR REFRACTORY CARDIAC ARREST: PRELIMINARY RESULTS OF A MULTIDISCIPLINARY APPROACH

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AIM

Cardiopulmonary resuscitation (CPR) of out-of-hospital cardiac arrest (OHCA) offers poor outcomes. Extracorporeal life support (ECLS) could be used as a salvage option for refractory OHCA patients in whom CPR is unsuccessful when the suspected cause of the cardiac arrest is potentially reversible. As the duration of CPR is a leading predictor of survival, pre-hospital implantation of ECLS has been suggested in an effort to reduce the time of low-flow and improve outcomes. We reviewed our institution's experience of pre-hospital ECLS implantation for refractory OHCA.

METHODS

We performed an observational analysis of our prospective database. Pre-hospital ECLS implantation was performed by one emergency medical service physician and one cardiac surgeon. The patient was then transferred to our medical intensive care unit. The primary endpoint was survival to hospital discharge with good neurological recovery, defined as Cerebral Performance Category (CPC) score 1 or 2 on a five-point scale.

RESULTS

Between June 2017 and December 2018, 11 patients received an ECLS in the pre-hospital setting. The mean age was 45.7 ± 11.1 years with 90.9% of males. The mean time of arrival on site of our team was 22.1 ± 11.0 minutes. At ECLS implantation, mean end-tidal carbon dioxide (ETCO₂) was 23.0 ± 8.8 mmHg and 4 (36.3%) patients presented a shockable rhythm. Mean no-flow and low-flow times were 2.0 ± 2.2 and 70.2 ± 17.1 minutes, respectively. Femoral cannulation failed in 1 (9.1%) patient and mean cannulation time was 20.1 ± 2.7 minutes. The causes of refractory OHCA were: acute myocardial infarction (n=5), hypertrophic cardiomyopathy (n=3) and unknown (n=2). Two (20%) patients presented lower limb ischemia during ECLS support while 1 (10%) patient required a surgical debridement of the groin due to a surgical site infection. Eight (80%) patients died during the first 48 hours of ECLS support (multiorgan failure n=5, brain death n=3) while 2 (20%) patients were successfully weaned from ECLS. Survival to hospital discharge CPC 1-2 was 20% (n=2). After a mean follow-up of 17.4 ± 3.2 months, survivors were still alive with a good neurological recovery.

CONCLUSIONS

In the setting of refractory OHCA, pre-hospital ECLS implantation is feasible and allows for a satisfactory survival with good neurological outcome. Further efforts of our multidisciplinary team should be addressed to the reduction of low-flow time in order to improve overall outcomes.

