

4th Annual ELSO-SWAC Conference Proceedings

Post-arrest management

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Cardiac arrest is a common problem, both in the in-hospital environment and in the out-of-hospital environment with an estimated incidence of over 300,000 – 400,000 cases of out-of-hospital cardiac arrests every year in the USA. Globally, the outcome of cardiac arrest remains poor, particularly with respect to neurological outcomes.¹ It is estimated that approximately 10 – 11% of patients with cardiac arrest survive to hospital discharge. Approximately 8 – 9% of patients survive to a good neurological outcome with a cerebral performance class of 1 to 2 (surviving to living at home with no or minimal support for activities of daily life). Survival is more likely if cardiac arrest has been witnessed by bystanders and cardiopulmonary resuscitation (CPR) has been commenced immediately. Survival is also more likely if the cause of cardiac arrest is ventricular arrhythmia, either ventricular fibrillation or ventricular tachycardia, and if early defibrillation is available. Given the poor outcomes from cardiac arrest, there has been a growing interest in using novel approaches to try and improve the outcomes, particularly the neurologically intact outcomes from cardiac arrest. One of the potential therapeutic modalities which has arisen in the last decade has been the use of extracorporeal membrane oxygenation (ECMO) for patients with cardiac arrest (E-CPR).² Although there have been a number of retrospective and prospective uncontrolled studies, or for some studies propensity matched with a current or historical control, observational studies have demonstrated potential benefits associated with ECMO.³ Currently, there are no randomized trials in the literature, although there are at least two trials currently being undertaken. Furthermore, at present, there is no widely accepted pathway for patients which provides recovery from cardiac arrest, commencement of E-CPR, management of the cardiovascular system and targeted therapy designed to protect the brain. E-CPR

continues to pose significant challenges in patient management, both in its implementation and in the management of patients following cardiac arrest and resuscitation.^{2,4} The management of patients is likely to be substantially different with E-CPR compared with conventional approaches, particularly following cardiac arrest. In particular, the management of the cardiac function is different in patients with retro-grade aortic blood flow, and the ideal management of the brain, including mean arterial pressure, cerebral perfusion pressure, ideal targets for carbon dioxide and arterial oxygen content, has yet to be defined. Another key challenge is neurological prognostication

and diagnosis of brain stem death, which is more challenging on ECMO.⁴ An additional area that requires careful consideration is temperature management, given the results of recent trials exploring the outcomes for patients managed with hypothermia compared with normothermia.⁵ The relevant literature will be covered and an approach to the management of the post-arrest patient, particularly with respect to considerations on ECMO, will be discussed.

Keywords: ECMO, cardiac arrest, targeted temperature management

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