

The use of extracorporeal membrane oxygenation (ECMO) in the current Indian scenario

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Extracorporeal membrane oxygenation (ECMO) is a technique whereby the pulmonary and/or cardiac function are supported externally by a pump and oxygenator, and is the mainstay of treatment in cases where the conventional therapy is not successful especially in patients with impending respiratory or cardiac failure [1-3].

ECMO provides physiologic cardiopulmonary support thus helping in reversing the attributes of the disease process and allow recovery [3]. However, ECMO does not provide treatment of the underlying disease in fact, it prevents the lung from further injury by reducing the incidence of ventilator-induced lung injury due to mechanical ventilation with high PEEP and prevents multi-organ failure due to hypoxemia and high vasopressor requirements [1,3]. The Extracorporeal Life Support Organization (ELSO) General Guidelines recommend the ECMO treatment to be considered when the expected mortality with conventional therapy is higher than 50% and ECMO is indicated when the chances of mortality is higher than 80% [1,4].

With the improvement in the technological aspects and remarkable developments in the practice of critical care, ECMO has burgeoned into a lifesaving technique with impeccable results [5]. Currently ECMO has become more reliable as evidenced by improvements in morbidity and mortality in critical cases [3]. Thus, the indications for ECMO are extended to more protracted use in intensive care units, such as a bridge to both lung and cardiac transplant and a support for lung resections in unstable cases [3,6]. Improved survival in patients with acute respiratory distress syndrome (ARDS) treated with ECMO during the H1N1 influenza pandemic have led to a significant expansion of ECMO use [5]. Neonatal implications of ECMO are widely reported in the literature [7].

ECMO is also used early in cases with cardiac arrest to aid in the traditional cardiopulmonary resuscitation in the form of extracorporeal cardiopulmonary resuscitation (ECPR) [5]. ECPR may play a role in the pre-hospital or emergency management of refractory cardiac arrest, cardiovascular collapse due to pulmonary embolism, drowning, hypothermia, airway obstruction, overdoses, and severe electrolyte abnormalities [5].

In the current Indian scenario, ECMO is available only at few large centers even in the national capital [8]. Besides, the inter-hospital transport of cases on conventional treatment to an ECMO center is very difficult which limits the use of this lifesaving therapy [8]. Kumar et al. 2016, suggested the importance of ECMO retrieval services in such a scenario thereby, allowing safe mobilization of these patients to ECMO centers and improving the chances of survival [8]. Mobile ECMO unit provides critically ill patients refractory to aggressive conventional treatment an option of hemodynamic and/or respiratory stabilization and subsequent transportation to specialized ECMO centers for further management [9]. However, out-of-hospital mobile ECMO implantation, transport and retrieval of patients require a significant multidisciplinary and organizational commitment, along with logistical and clinical efforts [9]. Initiating ECMO in a severe case requires considerations related to equipment, blood bank capabilities, cannulation configuration, availability of necessary personnel, and coordination with the receiving critical care physicians [5]. Also, the whole process is very costly around 12 lakh INR for 15 days and thus many patients are unable to bear the cost [5,10]. Few government hospitals have this facility, but in a country where a meagre amount is assigned to the annual health budget, having such relatively ultramodern lifesaving therapies readily in public hospitals looks like a distant dream [10].

Furthermore, the advantages of ECMO in critical care should be widely disseminated and thus the role of both the public and private undertakings along with the NGO's is important. The clinicians and staff working in the emergency department should be trained in the ECMO therapy so as to provide the best treatment without hesitation. Also, research studies regarding the easy availability, plans for setting-up of ECMO units in the government hospitals, and the treatment outcomes, both with conventional and in ECMO supported cases is imperative. Besides, a cost effective mobile ECMO rescue unit is the need of the hour.

Conflicts of interest: None declared

Acknowledgements: None

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