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ECMO and Emergency Medicine: Future Perspectives

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Letter to the Editor

The extracorporeal membrane oxygenation (ECMO) is a form of extracorporeal life support where external and artificial circuit conducts the venous blood from the patient to the oxygenator (gas exchange device) and after removal of carbon dioxide and blood oxygenation, carries this oxygenated blood to the patient circulation

We have to go back to 1954 to retrieve the origin of extracorporeal membrane oxygenation (ECMO): in this year, Dr. John Gibbon invented the heart lung machine to support patients during cardiac surgery. Following in the 1968 Kolobow and Zapol developed the membrane oxygenator that provided long-term extracorporeal circulation¹. In the 1970s, the ECMO was born and grew up: in the 1971 here was the first successful use of ECMO in the adult; in the 1975, there was the first neonatal ECMO; finally in the 1979, the first randomized controlled trial conducted on adult patients with severe acute respiratory failure (ARDS) comparing ECMO to mechanical ventilation. From the first case of ECMO to recent surgical procedures and device implantations, the ECMO has grown and emerged in the public health more and more.

In the current applications, the ECMO could support and optimize the patient's lung (partial support: Extracorporeal CO₂ removal- ECCO₂R) or lung/heart functions (total support). Especially, the modalities of ECMO depend to patient's disease and position of the cannulae. The modes of ECMO could be: Veno-Venous (V-V); Veno-Arterial (V-A); Veno-Pulmonary Artery (V-PA) [1].

The recent article of Mosier et al [2], described the main and increasing role of ECMO for critically ill adults in the emergency department, in particularly to treat severe acute respiratory failure, in the cardiac arrest and for the shock (cardiogenic, septic, toxic ingestions, thyrotoxicosis and trauma).

This thesis is also supported by Luyt et al [3], that documented the central and important role of ECMO in survival of patient affected by pandemic 2009 influenza A(H1N1) associated to severe ARDS.

Moreover, Monsieurs et al [4] described the role of ECMO as a rescue therapy for those patients in whom the initial ALS manoeuvres fail and to facilitate other specific interventions. In the 3-year prospective observational study and propensity analysis, Chen et al [5] documented the increasing of survival of cardiopulmonary resuscitation (CPR) with assisted extracorporeal life-support versus conventional CPR in the adults with in-hospital cardiac arrest (CPR-ECMO 29% vs CPR 12%).

In addition, Sauer et al [6] analysed the usage of ECMO, the survival rate and the hospitalization costs from 2006 to 2011 in the USA and documented the positive trend of survival rate in patients undergone to ECMO but without increasing the hospitalization hence the costs.

What would we attend from the future? The spreading and advanced use of ECMO with the current results of improvements in survival rates would be more and more safe and reliable with the new technologies, devices and better ability to manage ECMO patients.

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