Veno-venous Extracorporeal Membrane Oxygenation in Patient with Acute Respiratory Distress Syndrome

Thesis

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ABSTRACT

Introduction: Extracorporeal membrane oxygenation (ECMO) is considered a rescue therapy in severe cases of acute respiratory failure.

Aim of the work: Test the clinical impact on in- hospital patient course regarding morbidity and mortality using the Extracorporeal Membrane Oxygenation (ECMO) as a salvage therapy for patient with severe ARDS.

Methods: Our ECMO program started in January 2014. Since then we supported 23 respiratory failure patients on ECMO indicated according to ELSO guidelines, Respiratory failure patients were subjected to VV ECMO when lung injury score (LIS) was above 3 and PaO2/FiO2 <100 on protective lung strategy mechanical ventilation according to ARDS net protocol and or severe hypercapnia with pH < 7.2 with trial of prone positioningin the indicated cases. Percutaneous cannulation was done in all patients using single lumen cannulae, additional cannula was added when needed. Cardiohelp (Maquet, Germany) and Rotaflow (Maquet, Germany) ECMO consoles were used with centrifugal pump. ECMO circuits PLS for Rotaflow and HLS for Cardiohelp were changed when indicated.

Results: A total of twenty three patients received ECMO between January 2014 and April 2017. The mean age was 34 years. (Range 8–67 years), 10 males and 13 female. Out of patients of VV ECMO three had viral pneumonia, thirteen had bacterial pneumonia, two traumatic lung contusions and fourwith organophosphorus poisoning, and one had chemical pneumonitis leading to severe ARDS. Lung injury score range was 3.55 ± 0.24 , mechanical ventilation duration before ECMO 4.2 ± 2.8 , Femoro-jugular cannulation in 20 patients and femoro-femoral in 3 patients.

All patients were initially sedated and paralyzed and ventilated on pressure controlled ventilation with Pmax of 25 cm H2O and PEEP of 10 cmH2O. Heparin intravenous infusion was used initially in all patients and changed to Bivalirudin in patients due to possible HIT.

Pump flow ranged from 2.5 to 5.5 L/min. Support time was 12 days (range 2–39 days). Nine patients were successfully disconnected from ECMO and Eight survived to hospital discharge. Hospital length of stay ranged from 3 to 42 days, tracheostomy was done percutaneously in 4 patients.

Complications were recorded and their frequency were as following, neurological complication affected 4 patients , arrhythmia affected 13 patients , GIT bleeding affected 14 patients but most of attacks were self-limiting and needed no intervention, cannula site bleeding and infection was encountered in 13% and 17% of patient population respectively.

Pneumothorax was one of the most frequently encountered complication with rate reaching of 90% and this may be due to barotrauma caused by mechanical ventilator in the very last minutes before ECMO **institution**.

Conclusion: ECMO can be introduced in highly specialized tertiary centers in developing countries. Benchmarking against ELSO results may help continuous quality improvements in starting ECMO centers.

Key words

Severe ARDS, murray score, WEcme, ELSO