

INTERMITTENT DIALYSIS AND EXTRACORPORAL MEMBRANE OXYGENATION

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INTRODUCTION

Extracorporeal membrane oxygenation (ECMO) is used in critically ill patients presenting acute cardiac and/or pulmonary dysfunctions, who are at high risk of developing acute kidney injury and fluid overload.

OBJECTIVE

Describe the collaboration between anaesthesiology-resuscitation department (ARO), ECMO perfusionist and dialysis team. We will point out the specifics and differences between the initiation of standard dialysis treatment and providing renal replacement therapy during the ECMO procedure.

METHODOLOGY

The organization of work and the collaboration involve a clear division of competences according to individual specializations as follows:

- The ARO or RES department will request haemodialysis (HD) via ECMO
- The perfusionist will notify the dialysis centre of the time when the dialysis nurse should arrive
- The nephrologist creates a dialysis prescription – duration, dialyzer, type of dialysis solution
- The dialysis nurse prepares the haemodialysis machine and set the treatment parameters
- The perfusionist and dialysis nurse will connect the patient to the haemodialysis machine and disconnect the patient after the end of the HD. (Introduction of a RRT device into the ECMO circuit).
- The nurse from ARO, RES monitors the vital functions, ventilation parameters
- The dialysis nurse observes and monitors the dialysis parameters
- The perfusionist checks the ECMO

BENEFITS OF INTERMITTENT DIALYSIS AND ECMO:

- Vascular access is secured via ECMO – the patient is not burdened by creating a vascular access for haemodialysis, reducing the risk of infection associated with another vascular access
- Dose of heparin used is carefully controlled to prevent bleeding complications during ECMO procedure

DISADVANTAGES:

- Increased risk of bleeding
- High demands on patient care
- Risk of dislocation, disengagement of the cannulas

TREATMENT SPECIFICS:

The pressure in the ECMO machine affects the arterial and venous pressure in the HD machine – permanently in positive figures of up to 200 mmHg.

The dialysis circuit via the HD machine cannot be used to give infusions and blood products due to permanent high pressure.

It is possible to perform only the Haemodialysis, not Haemodiafiltration. Heparinization via an HD device is not required, the patient is adequately heparinized according to ARO, RES for the entire duration of the ECMO connection.

RESULTS

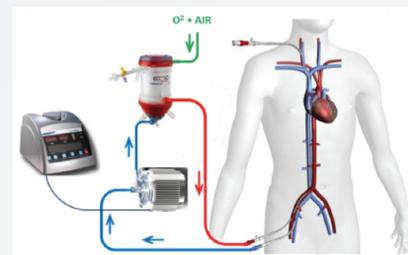
Thus far, we have used combination of extracorporeal membrane oxygenation and continuous renal replacement therapy in 4 patients – 2 with a diagnosis of H1N1 (swine flu), 1 patient with cardiogenic shock and 1 patient with acute respiratory distress syndrome (ARDS).

CONCLUSION

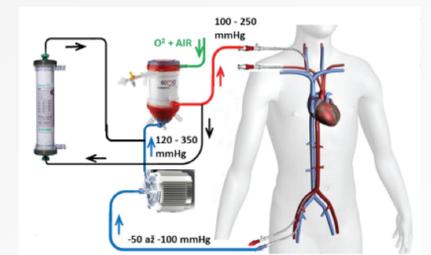
Intermittent HD and ECMO, conducted in collaboration with the specific workplace, are a clear benefit for the patient in terms of availability and quality of care.

Multidisciplinary patient care is also a source of sharing experience and knowledge among healthcare professionals. Effective team communication and collaboration are essential.

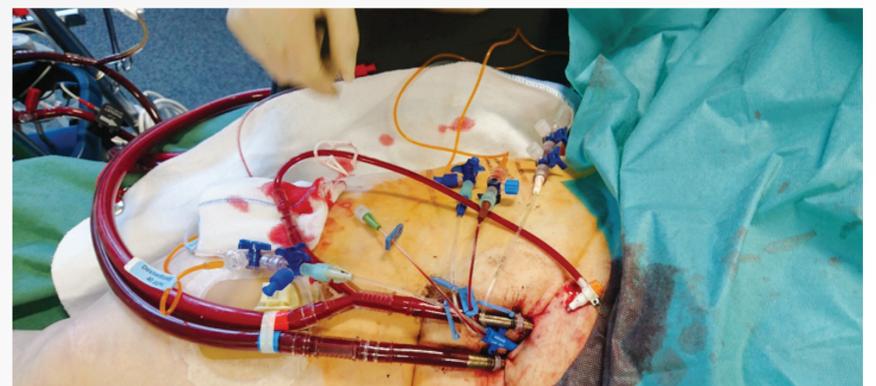
We plan to use our experience to make recommendations for nursing care for patients treated with intermittent dialysis and ECMO.



ECMO – principles



Pressures and connection



Insercion V-A ECMO



V-V ECMO – Vascular Access



Illustrative photography