Continuous dialysis by gravity through the filter of the extracorporeal membrane oxygenation

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current therapeutic options including non-specific immuno-suppression, conservative treatment with ACE inhibition, blood pressure reduction and lipid control. In MN associated with HCV infection, the rationale is enforced by the selective action of rituximab on B lymphocytes. However, large randomized clinical trials with longer follow-up are needed, to verify the efficacy and the long-term tolerability of rituximab therapy, in both idiopathic and secondary MN.

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As standard renal replacement therapies could not be used due to the blood pressure (BP) levels, we tried another depurative technique.

The ECMO system haemofilter was used as dialysis membrane (1.4 m² poly-ethersulfone membrane; Cobe cardiovascular, Mirandola, Italy). Dialysis fluid was provided by two 5 l bags suspended above the patient (Figure 1). A ‘Y’ tube system was used to deliver a kalium-free dialysate (Na 140 mmol/l, bicarbonate 34 mmol/l). To control dialysis flow speed, two plastics locks provided by the manufacturer alternatively closed and opened the system. From the filter, another ‘Y’ tube collected the drainage fluid in two 5 l bags below the patient. Each bag was weighed, using an electronic newborn scale, to calculate the ultrafiltration volume. A ‘Y’ line returned the blood from the ECMO: the main branch directly to the patient and the other to the haemofilter. The dialysis flow was maintained at 291 ml/min for 2 h and decreased to 83 ml/min for 3 h (mean flow 166 ml/min). Patient’s net balance throughout the procedure was zero and temperature 35.5 °C. After 5 h, BP increased to 76/45, pH to 7.4, kaliemia decreased to 6.2 mmol/l, lactate to 8.5 mmol/l and bicarbonate remained stable. In the absence of a positive fluid balance, improvement of kaliemia was attributed to dialysis. Improvement of BP could be due to the decrease in potassium levels and the slightly lower core temperature [5]. Lactate decrease was probably due to a better tissue perfusion, rather than a dialytic effect [6]. Gravity dialysis could then be changed to conventional CRRT.

In summary, the technique of continuous dialysis by gravity using the ECMO filter could be a therapeutic option in critically unstable patients, unable to tolerate CRRT and requiring urgent management of electrolytic disturbances (Figure 2).

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Fig. 1. Schematic representation of the system of dialysis by gravity.

Fig. 2. Photography of the dialysis by gravity system.