The Role of Critical Care Nephrology in Antibody-Mediated Cardiac Transplant Rejection Managed with Extracorporeal Blood Purification Technique

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Introduction

Therapeutic plasma exchange (TPE) using a CRRT machine allows the removal of pathogenic substances and can be offered as initial treatment for antibody-mediated rejection in cardiac transplant. The role of the nephrologist is essential, since in charge of the prescription. The filter TPE 2000 as membrane filtration (Fig. 1), with an effective surface area of 0.35 m2 of polypropylene with ethylene oxide sterilization, targets a large-molecular-weight substances present in plasma as immunoglobulin. TPE must be offered as initial therapeutic intervention as it rapidly removes pathogenic substances as antibodies and cytokines from patients' plasma. The technology is already in ICU: CRRT machines.

Clinical Case

A 24-year-old woman, post cardiac transplantation 4 months prior to admission for dilated cardiomyopathy. She arrived to ER with progressive dyspnea, orthopnea and oliguria. VS: BP 91/64 mmHg, HR 120bpm, 24 RR, O2 sat 85%. Echocardiography: LVEF 20%, severe cardiac graft dysfunction with severe impairment of biventricular function TAPSE 0. A myocardial biopsy was performed. She presented pulseless electrical activity and ALS were performed for 2 minutes with success. Inotropic and vasopressors were started, orotracheal intubation was required and the patient was transferred to ICU. Biopsy results shows acute cellular rejection 2R. Positive for changes compatible with antibody-mediated rejection (AMR). A cardiorenal syndrome developed. Steroids and TPE were offered. 5 sessions of plasma exchange with TPE 2000 membrane were given, prescription with 1.5 plasma exchange, each one with albumin at 25% (Table 1). After TPE treatment there was a vasopressor reduction, inotropic withdrawal, and LVEF increase to 40% were achieve after treatment. The patient continues with immune suppressant therapy, and she is stable as she waits for the next step in regard of the heart failure and a possible second transplant. The cardiorenal syndrome improved.

Discussion

Allograft dysfunction due to AMR is one of the worst complications post heart transplantations. Many therapies have been useful for these patients like high-dose steroids, intravenous immunoglobulin and TPE. In this case we were able to evaluate the allograft disfunction previously to TPE, and subsequently we measure the allograft improvement which was from LVEF pre-TPE 20% and post-TPE 40%. This can guide us to continue the research about TPE in AMR as there is no evidence-based guidelines that establish this therapy for patients as complex as they are.

Figure 1. CRRT machine with TPE membrane.

Conclusions

This can guide us to continue the research about TPE in AMR as there is no evidence-based guidelines that establish this therapy for patients as complex as this are. In Latin America is not a common practice in this type of patient, more research should be achieved.

Table 1. Prescription dose.

Weight (kg)	Htco (%)	Plasma Volume (ml)	Plasma Exchange (1.5)	Blood flow	Substitution Flow (ml/h)	Plasma UF (ml/h)	Total Volume (ml)
54	49	1823	2,735	120	1000	0	3000
54	38.5	2159	3,300	120	1000	0	3500
54	40	2106	3,200	120	1000	100	3500
54	32	2387	3,580	120	1000	100	3500
54	26	2596	3,893	120	1000	100	3510

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