

Combination ECMO and cytokine adsorption therapy for severe sepsis with cardiogenic shock and ARDS

*Lees N, Rosenberg A, Popov A, Hurtado-Doce A, Jones J, Marczin N, Simon A
Crit Care Med. 2015 Dec;43(12 Suppl 1):311*

A 33-year-old previously fit female, 5 months postpartum, presented with shock, ARDS, metabolic acidosis and neutropenia as well as a severely impaired, non-dilated left ventricle. Treatment for community-acquired pneumonia was initiated including mechanical ventilation and significant vasopressor support. Venous-arterial ECMO was started due to respiratory and cardiac failure, lactic acidosis and worsening organ function. Additionally, CytoSorb was added to the hemofilter circuit and antibiotics were administered. Treatment resulted in improved oxygenation, gradual resolution of lactic acidosis and most notably withdrawal of vasopressor support within 12 hours. The patient fully recovered and was asymptomatic two months later. This case demonstrates the novel and successful use of ECMO and cytokine removal in severe S.aureus sepsis with ARDS and cardiomyopathy and adds to the evidence showing cytokine adsorption as a compelling adjuvant therapy in severe sepsis.

Case presentation

- 33-year-old previously fit female, 5 mo postpartum, with four-day history of flu-like symptoms, breathlessness, delirium, chest and abdominal pains
- Condition: pyrexial, tachypneic and shocked, with ARDS (Murray score 3.7), metabolic acidosis (pH 7.1) and neutropenia
- Transthoracic echocardiography showed severely impaired, nondilated left ventricle (EF <15 %) and normal right ventricle
- Initiation of treatment for community-acquired pneumonia including mechanical ventilation and significant vasopressor support (NE 1-1.5 µg/kg/min, vasopressin 0.04 U/h, dobutamine)
- Transfer to specialized center for consideration of extracorporeal life support
- Start of venous-arterial ECMO (percutaneous femoral cannulation) within 5 hrs of arrival due to respiratory and cardiac failure, rising lactate and worsening organ function
- Staphylococcus aureus and H1N1 Influenza A were isolated later

Treatment

- CytoSorb in combination with Prismaflex[®] (Gambro, Sweden)
- Treatment time: 24 h
- Anticoagulation: unfractionated heparin

Measurements

- Oxygenation
- Lactic acidosis
- Vasopressor need

Results

- Improvement in oxygenation
- Gradual resolution of lactic acidosis
- Withdrawal of vasopressor support after 12 h

Patient Follow-Up

- LV function was normal by day 9 when ECMO was discontinued
- Discharge to the ward on day 30
- Review two months later was asymptomatic

CONCLUSIONS

- Next to improvement of oxygenation and resolution of lactic acidosis, rapid weaning of vasopressors was the most notable clinical effect associated with CytoSorb therapy
- Treatment demonstrates the novel and successful use of ECMO and cytokine removal in severe S.aureus sepsis with ARDS and cardiomyopathy
- This case adds to the evidence showing cytokine adsorption as a compelling adjuvant therapy in severe sepsis