An Early Aggressive Strategy for the Treatment of Hanta Virus Cardiopulmonary Syndrome: A Perspective From an Extracorporeal Membrane Oxygenation Center

To the Editor—We received a 47-year-old man in cardiopulmonary distress. Two weeks before admission, the patient had experienced fevers, myalgias, anorexia, and fatigue. He went to a local emergency department where he received antibiotics and was discharged with presumed community-acquired pneumonia. Four hours later, he returned with worsening dyspnea in hypoxemic respiratory failure. Chest radiograph was reported as multifocal pneumonia. Intravenous antibiotics were initiated and he was transferred to our hospital.

Three weeks earlier, he had gone fishing in Port Lavaca, Texas, and stayed in a cabin infested with rat feces. The rest of his social and family history was unremarkable. On initial presentation, noninvasive ventilation was converted to intubation and mechanical ventilation for worsening hypoxemia. His exam showed fever with a temperature of 39.2°C, blood pressure of 91/63 mm Hg, and tachycardia. Hypoxemia persisted despite support with 100% fraction of inspired oxygen and high positive end expiratory pressure. Aside from diffuse lung crackles, the rest of his exam was negative. His initial chest radiograph had bilateral alveolar opacities. Blood gas revealed a PaO₂/FiO₂ ratio <100, consistent with severe acute respiratory distress syndrome (ARDS). His laboratory tests showed a white blood count of 49,000 cells/µL, acute renal failure with a creatinine level of 3.8 mg/dL, and severe lactic acidosis with a serum lactate level of 47 mg/dL. Bedside cardiac echocardiography demonstrated poor left ventricle contractility.

Because of combined hemodynamic and pulmonary failure with epidemiological data concerning for Hanta virus exposure, the patient underwent early venoarterial extracorporeal membrane oxygenation (VA-ECMO) cannulation. Hanta virus studies were sent to the Centers for Disease Control and Prevention, later coming back positive. We provided full hemodynamic support and lung "rest" ventilation, and utilized continuous renal replacement therapy to limit volume overload. His systolic function, oxygenation, and radiographic findings rapidly improved (Figure 1). He was successfully
decannulated from ECMO on hospital day 5 and extubated on day 7.

Hanta virus cardiopulmonary syndrome (HVCPS) is a systemic manifestation of a disseminated viral infection characterized by severe ARDS and hemodynamic instability as a result of distributive and cardiogenic shock. The mortality predicted with this syndrome can be as high as 100% [1]. VA-ECMO has been previously used to support patients with severe HVCPS, but historically only as a “rescue” therapy after conventional strategies to treat shock and ARDS have failed [2, 3]. There is no clear guide in the literature as to the optimal timing to pursue this invasive strategy for HVCPS [4].

In our patient, the high index of suspicion for HVCPS and the critical nature of his clinical state prompted us to employ VA-ECMO as an early intervention before vasopressors and low tidal volume ventilation failed to improve his critical condition. This aggressive approach for early full supportive care resulted in rapid and safe recovery from cardiorespiratory failure due to HVCPS. This clinical case suggests that early use of VA-ECMO in HVCPS could be a key factor associated with better clinical outcomes.

Note

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References


