ECMO Boosts Survival in Flu-Induced Acute RDS

BY KERRI WACHTER

Most patients in Australia and New Zealand who developed acute respiratory distress syndrome due to 2009 influenza A(H1N1) and were treated with extracorporeal membrane oxygenation survived, with a mortality rate of 21%. The results were drawn from data compiled during the winter season in these countries.

"Despite the disease severity and the intensity of treatment, the mortality rate was low," Dr. Andrew R. Davies of Monash University, Melbourne, and his colleagues reported.

"Our findings have implications for health care planning and the clinical management of patients with 2009 influenza A(H1N1) during the 2009-2010 northern hemisphere winter. Our results indicate that the incidence of ARDS [acute respiratory distress syndrome] sufficient to warrant consideration of ECMO … exceeds 2.6 per million inhabitants."

With a similar incidence of ECMO use, the United States and the European Union could provide ECMO to approximately 800 and 1,300 patients, respectively, during their 2009-2010 winter season, the researchers wrote (JAMA 2009;302:doi:10.1001/JAMA.2009.1535).

The study by the Australia and New Zealand Extracorporeal Membrane Oxygenation Influenza Investigators included all adult and pediatric patients who were treated with extracorporeal membrane oxygenation (ECMO) between June 1 and Aug. 31, 2009, in 15 ICUs in the two countries. Neonates and patients treated with ECMO for primary cardiac failure following heart and/or lung transplantation were excluded. All outcomes were censored at midnight Sept. 7, 2009.

A total of 252 patients were admitted with influenza to the participating ICUs. Of these, 201 received mechanical ventilation. A total of 68 received ECMO; 61 had confirmed H1N1 infection. The 68 ECMO patients had a mean age of 34 years; half were male. The most common comorbidities were obesity (body mass index greater than 30 kg/m^2), asthma, and diabetes mellitus. Six patients were pregnant, and four patients were post-partum. Three patients were children younger than 15 years. Of the 68 ECMO patients, 48 survived to ICU discharge (32 were discharged from the hospital and 16 were still hospital inpatients). Fourteen patients (21%) had died, and six remained in the ICU.

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Among the 14 patients who died, intracranial hemorrhage (6 patients), other hemorrhage (4), and intractable respiratory failure (4) were the most common causes of death. Notably, 7 of the 10 pregnant/postpartum patients survived. All three of the children treated with ECMO were alive, though one was still in the ICU.

During ECMO, hemorrhagic complications occurred in 54% of patients and infective complications in 62%.

The researchers estimated the incidence of ECMO use for the combination of confirmed and suspected 2009 influenza A(H1N1) during the winter season to be 2.6 cases per million people. When only confirmed cases were considered, the incidence fell slightly to 2.0 cases per million. By comparison, 0.15 cases per million were treated with ECMO for ARDS in the preceding winter season.

The investigators also obtained data on 133 patients with confirmed H1N1 infection in the same ICUs who were treated with mechanical ventilation but not ECMO. Patients treated with ECMO had longer median durations of mechanical ventilation (18 days vs. 8 days), longer median ICU stays (22 vs. 12), and greater ICU mortality (14 vs. 12), compared with those who did not receive ECMO.

Dr. Davies treats patients in the ICU of Alfred Hospital in Melbourne. The authors reported that they have no relevant financial relationships. ■