Abstract

Background. In patients receiving mechanical ventilation for acute respiratory distress syndrome (ARDS), neuromuscular blocking agents (NMBAs) may improve oxygenation and decrease ventilator-induced lung injury but may cause muscle weakness. We evaluated whether two days of NMBA therapy in early severe ARDS improved clinical outcomes.

Methods. Patients with onset within the last 48 hours of severe ARDS (PaO_2:FiO_2<150 mm Hg with ≥5 cm H_2O positive end-expiratory pressure and 6-8 ml/kg tidal volume) were enrolled in a multicenter double-blind randomized trial of cisatracurium besylate (n=178) versus placebo (n=162), both for 48 hours. The primary outcome was 90-day inhospital mortality (proportion of patients who died before hospital discharge and within 90 days after study enrollment).

Results. Crude 90-day mortality was 31.6 percent (95 percent confidence interval, 25.2;38.8 percent) in the NMBA group and 40.7 percent (33.5;48.4 percent) in the placebo group (*P*=0.08). The Cox regression model adjusted for the Simplified Acute Physiology Score II and plateau pressure on inclusion yielded a hazard ratio for 90-day mortality in the NMBA group of 0.68 (0.48;0.98; *P*=0.04). Mortality at 28 days was 23.7 percent (18.1;30.5 percent) with NMBA and 33.3 percent (26.5;40.9 percent) with placebo (*P*=0.05). The NMBA group had more ventilator-free and organ-failure-free days during the first 28 days and fewer cases of pneumothorax (4.0 vs. 11.7 percent, *P*=0.01), compared to the placebo group. The rate of muscle weakness was not different between the two groups.

Conclusions. In patients with severe ARDS, early NMBA administration improved adjusted 90-day survival and increased time off the ventilator without increasing muscle weakness.

(Trial Registration clinicaltrials.gov Identifier: NCT00299650)