Effectiveness of Prehospital Continuous Positive Airway Pressure in the Management of Acute Pulmonary Edema


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Objective. To compare the effectiveness of continuous positive airway pressure (CPAP) with standard pharmacologic treatment in the management of prehospital acute pulmonary edema.

Methods. Using a nonrandomized control group design, all consecutive patients presenting to two participating emergency medical services (EMS) systems with a field impression of acute pulmonary edema between July 1, 2004, and June 30, 2005, were included in the study. The control EMS system patients received standard treatment with oxygen, nitrates, furosemide, morphine, and, if indicated, endotracheal intubation. The intervention EMS system patients received CPAP via face mask at 10 cm H2O in addition to standard therapy.

Results. Ninety-five patients received standard therapy, and 120 patients received CPAP and standard therapy. Intubation was required in 8.9% of CPAP-treated patients compared with 25.3% in the control group (p = 0.003), and mortality was lower in the CPAP group than in the control group (5.4% vs. 23.2%; p = 0.000). When compared with the control group, the CPAP group had more improvement in respiratory rate (~4.55 vs. ~1.81; p = 0.001), pulse rate (~4.77 vs. 0.82; p = 0.013), and dyspnea score (~2.11 vs. ~1.36; p = 0.008). Using logistic regression to control for potential confounders, patients receiving standard treatment were more likely to be intubated (odds ratio, 4.04; 95% confidence interval, 1.64 to 9.95) and more likely to die (odds ratio, 7.48; 95% confidence interval, 1.96 to 28.54) than those receiving standard therapy and CPAP.

Conclusion. The prehospital use of CPAP is feasible, may avert the need for endotracheal intubation, and may reduce short-term mortality.