

Drug does not significantly reduce duration of mechanical ventilation for COPD patients

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Among mechanically ventilated patients with chronic obstructive pulmonary disease (COPD) and metabolic alkalosis, administration of the respiratory stimulant acetazolamide did not significantly reduce the duration of invasive mechanical ventilation, according to a study in the February 2 issue of *JAMA*.

Chronic [obstructive pulmonary disease](#) is a frequent cause of [intensive care unit](#) (ICU) admission. Noninvasive mechanical ventilation has altered the outcomes of patients with acute COPD exacerbation by reducing the need for intubation. Nevertheless, patients with COPD may still require invasive mechanical ventilation when noninvasive ventilation fails. Acetazolamide has been used for decades as a respiratory stimulant for patients with COPD and metabolic alkalosis (an increase in the alkalinity of body fluids due to an increase in alkali intake or a decrease in acid concentration), but no large randomized placebo-controlled trial has been available to confirm this approach.

Christophe Faisy, M.D., Ph.D., of the European Georges Pompidou Hospital, Paris, and colleagues randomly assigned 382 patients with COPD who were expected to receive mechanical ventilation for more than 24 hours to acetazolamide (500-1000 mg, twice daily) or placebo, administered intravenously in cases of pure or mixed metabolic alkalosis. Treatment was initiated within 48 hours of ICU admission and continued during the ICU stay for a maximum of 28 days; 380 patients were included in an intention-to treat analysis. The study was conducted from October 2011 through July 2014 in 15 ICUs in France. The

primary outcome was the duration of invasive mechanical ventilation via endotracheal intubation or tracheotomy.

Among 382 randomized [patients](#), 380 completed the study. For the acetazolamide group (n = 187), compared with the placebo group (n = 193), no significant between-group differences were found for median duration of mechanical ventilation (-16.0 hours), duration of weaning off mechanical ventilation (-0.9 hours), or for other respiratory parameter-values (respiratory frequency, tidal volume, and minute ventilation), although daily changes of serum bicarbonate and number of days with metabolic alkalosis decreased significantly more in the acetazolamide group.

Secondary outcomes, such as adverse events, use of [noninvasive ventilation](#) after extubation, the duration of ICU stay, and in-ICU mortality, did not differ significantly between groups.

The authors note that the primary finding of this study ([duration](#) of invasive [mechanical ventilation](#)) must be considered with prudence. "Indeed, the study may have identified a clinically important benefit of acetazolamide for the primary end point that did not demonstrate statistical significance because of a possible lack of power."

More information: *JAMA*, [DOI: 10.1001/jama.2016.0019](https://doi.org/10.1001/jama.2016.0019)

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