Medical Xpress

Study shows unassisted method works best to restore independent breathing in patients on ventilators

January 28 2013

(Medical Xpress)—Use of a device that supplies humidified oxygen is more effective than a technique that reduces positive airway pressure delivered to the lungs in helping patients who have been on a ventilator more than 21 days regain the ability to breathe on their own, according to a study supported by the National Institutes of Health.

The research compared twocommon methods for removing such patients from a ventilator, a practice known as weaning. One is to use a tracheostomy collar, which is placed over a breathing tube in a tracheotomy incision in the throat, and through which humidified oxygen is given. The other is to reduce the pressure support supplied via the ventilator.

The study found tracheostomy collars significantly outperformed pressure support in helping patients breathe on their own again. Researchers examined data on patients in long-term acute care hospitals (LTACH), which specialize in weaning patients from ventilators. Such patients are increasingly sent to LTACHs from intensive care units, or ICUs. The study found the median weaning time among the 194 study participants in an LTACH was six days shorter with tracheostomy collar use.

The study, funded by the National Institute of Nursing Research (NINR), a component of the NIH, appeared online this week in the

Journal of the American Medical Association (JAMA).

"By contributing to the evidence base for weaning from machine-assisted breathing, this study will help improve the quality of life for patients on ventilators by helping them regain their ability to breathe on their own more quickly," said NINR Director Patricia A. Grady, Ph.D. "Clinicians also benefit from patient-centered data—which nursing science studies such as this are providing—to develop the most effective guidelines for common procedures such as weaning."

Use of LTACHs for weaning increased 267 percent between 1997 and 2006. Yet the relative efficacy of these two weaning methods (tracheostomy collars and pressure support) within the LTACH setting has received little or no scrutiny.

The study was led by Amal Jubran, M.D., from Edward Hines Jr. Veterans Affairs Hospital, Hines, Ill., RML Specialty Hospital, Hinsdale, Ill., and Loyola University of Chicago Stritch School of Medicine in Maywood, Ill. Jubran and colleagues used a five-day unassisted breathing screening procedure to select participants from among 500 patients enrolled for the study. Three hundred twelve patients were selected and randomized, and 194 completed the study (118 died or withdrew, but were included in the analysis).

Participants were divided into two groups based on the time it took them to fail the screening procedure: an early-failure group (0-12 hours) or a late-failure group (12-120 hours). They were then randomly assigned to pressure support or a tracheostomy collar for weaning. Successful weaning for both groups was defined as the ability to sustain five days of unassisted breathing.

"The results of the study show that the method of ventilator weaning can significantly improve the outcome of patients who require prolonged

mechanical ventilation at an LTACH facility," said Jubran.

Researchers also found a difference in weaning rates based on the time it had taken a patient to fail the screening procedure, with the late-failure group weaning 2.2 times faster with the tracheostomy collar than with pressure support. There was no significant difference in weaning rates between the two techniques for the early-failure group. "Severity of illness may have had a greater influence on weaning outcome for this group than did weaning method," noted Jubran.

In addition, the researchers discovered several clinical variables associated with the time required for successful weaning in addition to weaning technique: age, ventilator duration before randomizing, the ratio of how fast and deep a patient could breathe, and the strength of a patient's ability to inhale. The data also indicated that some patients could have been weaned at the ICU, avoiding the need for transfer to the LTACH, since more than 32 percent of the 500 enrolled passed the five-day unassisted breathing challenge.

More information: Jubran A., et al. Effect of pressure support vs. unassisted breathing through a tracheostomy collar on weaning duration in patients requiring prolonged mechanical ventilation. *Journal of the American Medical Association* jama.jamanetwork.com/article.a … D=1558054#qundefined

Provided by National Institutes of Health