ICU
MANAGEMENT & PRACTICE

Probiotic Therapy Cuts Risk of Ventilator-Associated Pneumonia in Half for Some in ICU, Study Finds

Daily use of probiotics reduced ventilator-associated pneumonia (VAP) in critically ill patients by almost half, according to new research from Creighton University School of Medicine in Omaha, Nebraska.

The study was published on the American Thoracic Society's Web site ahead of the print edition of the American Journal of Respiratory and Critical Care Medicine.

It is estimated that VAP complicates the care of up to 30 percent of critical care patients receiving mechanical ventilation. "Patients with VAP have increased morbidity, mortality and hospital costs as well as prolonged intensive care unit (ICU) and hospital lengths of stay, and increased costs."

"We chose to study probiotics in this context because VAP is increasingly caused by pathogens associated with antimicrobial resistance and the supply of novel antibiotics is essentially nonexistent for the foreseeable future," said Lee E. Morrow, M.D., M.Sc., associate professor of medicine at Creighton University and lead author. "The implication is that novel methods of prevention must be our priority."

Although previous studies have suggested that probiotics might be effective in reducing risk of VAP, the results have been limited by the quality of their design.

"We were unsure what to expect with this trial," said Dr. Morrow. "Ultimately our hope was that upon completion of this 'proof of concept' study we could demonstrate two critically important points in a patient group at high risk for developing VAP: One, that properly selected probiotic agents can be safely administered to critically ill patients; and, two, when administered to the proper study population these agents also have efficacy in disease prevention. We felt that rigorously establishing these suppositions as facts was essential in order to continue to study probiotic agents in the intensive care unit setting."

Dr. Morrow and colleagues included 138 critically ill patients from a single center to receive either placebo or probiotic therapy. Patients in the treatment arm received 2 x 109 colony-forming units of Lactobacillus rhamnosus twice daily -- half the dose was administered as a slurry to the oropharynx and the remainder was given through nasogatsric tube. After almost 5 years, the researchers found that daily use of probiotics not only decreased VAP infections by about 50 percent compared to placebo, but also reduced the amount of antibiotics needed in comparison to placebo-treated patients. This reduction in antibiotic consumption led to significantly fewer Clostridium difficile infections in patients given probiotics. No side effects attributable to the probiotics were observed.
Meta analysis of similar studies shows an overall reduction in VAP of 39 percent with probiotics.
"Collectively, these data suggest that Lactobacillus may represent a novel, inexpensive (retail price, $2.13 per day for four tablets as administered per protocol), and non-antibiotic approach to prevention of nosocomial infections in properly selected ICU patients," said Dr. Morrow.

Because the patients were carefully selected to reduce the risk of iatrogenic infection, and over 90 percent of patients in the ICU were deemed ineligible for the study, it is important to note, Dr. Morrow cautioned, that these findings are not applicable to all ICU patients and probiotics should not be used for VAP prophylaxis beyond the population that was included in this study.

"We strongly emphasise that these data should be viewed as preliminary in nature and cannot be generalised to the general ICU population given the prolonged period of enrolment, the rigorous inclusion criteria, the large number of exclusion criteria and the small number of patients included.
Other studies have found potentially harmful effects of probiotics, underscoring the need for meticulous monitoring of patients.

"Probiotic prophylaxis of VAP using Lactobacillus rhamnosus GG appears safe and efficacious in a select population with a very high risk of VAP," concluded Dr. Morrow. "Ultimately, probiotics may fulfill a role in antimicrobial stewardship programs given the reductions in antibiotic consumption. Larger, multicentre clinical trials with more liberal inclusion criteria are needed to establish efficacy of probiotics and to allow for extrapolation to a larger at-risk population."

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Journal Reference:

Lee E. Morrow, Marin H. Kollef, and Thomas B Casale. Probiotic Prophylaxis of Ventilator-associated Pneumonia: A Blinded, Randomised, Controlled Trial. American Journal of Respiratory and Critical Care Medicine, 2010; DOI: 10.1164/rccm.200912-1853OC

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