Do Patients Die From, or With, Ventilator-Associated Pneumonia?

BY DAMIAN McNAMARA

EXPERT ANALYSIS FROM THE ANNUAL CONGRESS OF THE SOCIETY OF CRITICAL CARE MEDICINE

MIAMI BEACH — The extent of mortality due to ventilator-associated pneumonia remains uncertain, but its impact on increasing morbidity and hospital costs is clear, Dr. Robert C. Hyzy said.

"Pneumonia is bad; pneumonia kills people; so, ventilator-associated pneumonia must be bad, too, right?" Dr. Hyzy said at the annual congress. The unresolved issue is whether patients die with or die from ventilator-associated pneumonia (VAP).

There is little evidence-based medicine to make this determination. Most studies designed to assess VAP mortality are observational cohort trials.

For example, a systematic review of observational studies revealed an overall relative mortality risk of 1.27 for patients with VAP, compared with those without (Crit. Care Med. 2009;37:2709-18). "But a high degree of heterogeneity between studies limits the observation," said Dr. Hyzy, who is an associate professor of medicine and director of the critical care medicine unit at the University of Michigan, Ann Arbor. "Ultimately, these investigators said they do not know."

However, there are two subpopulations for which there is enough evidence to clear VAP of attributable mortality, he added.

In a subset of patients—those with acute respiratory distress syndrome (ARDS) or trauma—data were sufficiently robust to demonstrate that mechanically ventilated patients were not at increased risk of death if they developed VAP. "This makes sense—these patients are very sick to begin with," Dr. Hyzy said.

Regarding morbidity, another study indicated that 27% of 401 patients with microbiologically proven VAP experienced recurrence of pneumonia within 28 days of onset of VAP (Crit. Care Med. 2007;35:146-54).

A 14% relapse rate and a 19% superinfection rate were other findings in that study. Dr. Hyzy noted that recurrence was more likely if patients were infected with methicillin-resistant *Staphylococcus aureus* (odds ratio, 2.50) or nonfermenting gram-negative bacilli (OR, 2.00).

Interestingly, recurrence did not differ significantly between patients who received 8 days vs. 15 days of antibiotic therapy.

Not surprisingly, superinfection increased length of hospital stay and costs for patients with VAP. Other researchers quantified those effects in a retrospective study of 74 patients (Semin. Respir. Crit. Care Med. 2009;30:116-23). The researchers in that study found that median length of stay was 48 days for patients who had a superinfection, compared with 28 days for unaffected patients.

"If you stay longer, you may get superinfected, and you can get recurrence. Also, the longer you stay, the more it will cost," Dr. Hyzy said.

Other researchers calculated that the cost attributable to VAP was $11,897.

They studied 819 mechanically ventilated patients, 127 (16%) of whom developed VAP. Total hospital costs also were significantly higher for VAP patients, $70,568, compared with non-VAP patients, $21,620 (Crit. Care Med. 2003;31:1312-7). Total costs included room, nursing, respiratory therapy, and pharmacy.

In March 2009, a health economist reported costs associated with a range of hospital-acquired infections, including approximately 52,542 VAP infections (www.cdc.gov/NCIDOD/DHQP/pdf/Scott_CostPaper.pdf). On a per-patient basis, the average costs ranged from $14,806 to $27,520.

Silver-coated endotracheal tubes for mechanical ventilation of critical care patients were associated with lower rates of VAP, 4.8%, compared with traditional tubes, 7.5%, in another study (JAMA 2008;300:805-13). However, their higher cost needs to be considered, said Dr. Hyzy, a collaborator on the study.

Dr. Hyzy disclosed that he is a former consultant to Kimberly-Clark, maker of the silver-coated Microcuff Endotracheal Tube. ■

More Time on Mechanical Ventilation Was Not Linked to Worse Survival

BY DAMIAN McNAMARA

FROM THE ANNUAL CONGRESS OF THE SOCIETY OF CRITICAL CARE MEDICINE

MIAMI BEACH — Patients who exceeded their expected time on mechanical ventilation by 2 or more days fared no worse than did those who were weaned within predicted times, based on discharge rates and follow-up at 30, 60, and 90 days.

VITALS

Major Finding: In 996 patients on mechanical ventilation longer than expected, standardized mortality ratios were 0.74 for the ICU and 0.77 for the hospital.

Data Source: Single-center review of 5,345 patients ventilated on their first day in the ICU during the period 2004-2009.

Disclosures: None were reported.

Of 5,345 patients who were mechanically ventilated on their first ICU day, nearly 19% (996) were outliers. Yet survival was better than expected in this group, with standardized mortality ratios of 0.74 for the ICU and 0.77 for the hospital. In other terms, 65 of the 996 patients in the outlier group were "unexpected survivors," Kelly Becker, R.N., said at the annual congress of the Society of Critical Care Medicine.

Survival to, 30, 60, and 90 days was assessed for a subset of 99 patients ventilated in 2008. Of those patients, 75% survived for at least 90 days post discharge.

"We did not have the outcomes we expected at all—we were surprised," Ms. Becker said in an interview at a poster she copresented with Sue Hanna. Both presenters are affiliated with Borgess Medical Center, a 424-bed research and teaching hospital in Kalamazoo, Mich.

"Length of stay and length of time on a ventilator does not always measure how well you are taking care of a patient who is critically ill," she remarked.

Patients in the study were on mechanical ventilation between November 2004 and July 2009. The median APACHE score was 78 (range, 74-104). Nearly half (48%) were aged 65 years or older.

In aggregate, the patients who exceeded their expected mechanical ventilation time by at least 2 days (the APACHE IV definition of ventilator outlier) had 9,163 more total days of mechanical ventilation than predicted. Similarly, this group spent 10,956 more days than expected in the ICU and 9,750 additional days in the hospital.

The study is ongoing, with more patients being recruited, Ms. Becker said. ■

Disposable Sheath Prevents Endoscope Contamination

BY HEIDI SPLETE

FROM THE TRIOLOGICAL SOCIETY'S COMBINED SECTIONS MEETING

ORLANDO — Sterile, disposable sheaths for flexible endoscopes are as effective as germicidal solutions in preventing cross-contamination, and they take less time to use, according to the results of a randomized, controlled trial that included 100 fiberoptic nasopharyngolaryngoscopes.

Cross-contamination from flexible endoscopes remains a problem, highlighted by a recent outbreak in the Veterans Administration health system last year, said Dr. Alphi P. Elackattu, a resident in otolaryngology–head and neck surgery at Boston University. In that outbreak, about 10,000 patients were exposed to cross-contamination due to mechanical failure or human error, he explained at the meeting.

VITALS

Major Finding: A disposable sheath took significantly less time to use than a germicidal solution (89 seconds vs. 14 minutes), and was as effective in decontaminating flexible endoscopes.

Data Source: A randomized, controlled trial including 100 fiberoptic nasopharyngolaryngoscopes.

Disclosures: The researchers had no financial conflicts to disclose.

Dr. Elackattu and his colleagues hypothesized that using individually packaged sterile sheaths for flexible endoscopes would cut down on cross-contamination.

In their study, they collected baseline cultures from several sites on each of 100 fiberoptic nasopharyngolaryngoscopes (FNPLs). After use, the FNPLs were randomized to either the sheath protocol or the standard disinfection protocol of immersion in germicidal solution.

The product used in the study was the Slide-On EndoSheath from Medtronic Inc., but Medtronic was not involved in the study.

The researchers noted that the average time spent on the process of disinfection was significantly shorter when using the sheath than it was when using the germicidal solution (89 seconds vs. 14 minutes).

After a single use and disinfection protocol, there were no significant differences in the presence of organisms on the FNPLs in the sheath group, compared with the germicidal solution group.

Subjective observations by staff members suggested that germicidal immersion might actually increase the risk of cross-contamination involving FNPLs because it is more complicated to perform than using a disposable sheath, Dr. Elackattu noted.

In addition, patients might feel more secure and comfortable when they see that a disposable sheath is being used on the nasopharyngolaryngoscope, he said.

More research is needed to assess the value of using a disposable sheath and of combining the use of a sheath with the use of germicidal solution, Dr. Elackattu said at the meeting.

The meeting was jointly sponsored by the Triological Society and the American College of Surgeons. ■