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Does De-Escalation of Antibiotic Therapy for Ventilator-Associated Pneumonia Affect the Likelihood of Recurrent Pneumonia or Mortality in Critically Ill Surgical Patients?

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BACKGROUND: Ventilator-associated pneumonia (VAP) is a leading cause of mortality in critically ill patients. Although previous studies have shown that de-escalation therapy (DT) of antibiotics may decrease costs and the development of resistant pathogens, minimal data have shown its effect in surgical patients or in any patients with septic shock. We hypothesized that DT for VAP was not associated with an increased rate of recurrent pneumonia (RP) or mortality in a high acuity cohort of critically ill surgical patients.

METHODS: All surgical intensive care unit (SICU) patients from January 2005 to May 2007 with VAP diagnosed by quantitative bronchoalveolar lavage with a positive threshold of 10,000 CFU/mL were identified. Data collected included age, gender, Acute Physiologic and Chronic Health Evaluation Score III (A3), type of bacterial or other pathogen, antibiotics used for initial and final therapy, mortality, RP, and appropriateness of initial therapy (AIT). Patients were designated as receiving AIT, DT, or escalation of antibiotic therapy based on microbiology for their VAP.

RESULTS: One hundred thirty-eight of 1,596 SICU patients developed VAP during the study period (8.7%). For VAP patients, the mean Acute Physiologic and Chronic Health Evaluation III score was 82.7 points with a mean age of 63.8 years. The RP rate was 30% and did not differ between patients receiving DT (27.3%) and those who did not receive DT (35.1%). Overall mortality was 37% (55% predicted by A3 norms) and did not differ between those receiving DT (33.8%) or not (42.1%). The most common pathogens for primary VAP were methicillin-resistant Staphylococcus aureus (14%), Escherichia coli (11%), and Pseudomonas aeruginosa (9%) whereas P. aeruginosa was the most common pathogen in RP. The AIT for all VAP was 93%. De-escalation of therapy occurred in 55% of patients with AIT whereas 8% of VAP patients required escalation of antibiotic therapy. The most commonly used initial antibiotic choice was vancomycin/piperacillin-tazobactam (16%) and the final choice was piperacillin-tazobactam (20%). Logistic regression demonstrated no specific parameter correlated with development of RP. Higher A3 (Odds ratio, 1.03; 95% confidence interval, 1.01-1.05) was associated with mortality whereas lack of RP (odds ratio, 0.31; 95% confidence interval, 0.12-0.80), and AIT reduced mortality (odds ratio, 0.024; 95% confidence interval, 0.007-0.221). Age, gender, individual pathogen, individual antibiotic regimen, and the use of DT had no effect on mortality.

CONCLUSION: De-escalation therapy did not lead to RP or increased mortality in critically ill surgical patients with VAP. De-escalation therapy was also shown to be safe in patients with septic shock. Because of its acknowledged benefits and lack of demonstrable risks, de-escalation therapy should be used whenever possible in critically ill patients with VAP.

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