Pneumonia After Tracheotomy

To the Editor:

I read with interest Dr. Rello’s report (December 2003) on the incidence, etiology, and outcome of nosocomial pneumonia in ICU patients requiring percutaneous tracheotomy for mechanical ventilation. He showed that as many as 18% of patients acquired ventilator-associated pneumonia (VAP) after tracheotomy, most of them in the first week after the procedure.

Unfortunately, the investigators did not compare the incidence of VAP in patients after tracheotomy with the incidence of nosocomial pneumonia in patients not receiving a tracheostomy. When the incidence of pneumonia in the latter group is as high as in the studied population, which very well might be the case, one can also say that prolonged mechanical ventilation predisposes to pneumonia. Thus, their conclusion—percutaneous tracheotomy predisposes to pneumonia—is not accurate.

Furthermore, I was very much surprised to see that antimicrobial prophylaxis before tracheotomy—a single dose of amoxicillin-clavunate—was recommended. In addition, many patients received antibiotics before the procedure (80%). Antibiotic use may have predisposed to the high incidence of VAP, more than the procedure itself. It is not correct to state that the current findings suggest the need to select an antipseudomonal agent for prophylaxis; one can also suggest not administering antimicrobial prophylaxis.

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Reference


Ventilator-Associated Pneumonia, Percutaneous Tracheostomy, and Antimicrobial Prophylaxis

To the Editor:

Dr. Schultz raises pertinent concerns about the use of antimicrobial prophylaxis in patients who undergo percutaneous tracheostomies, and disagrees with our interpretation of the findings of ventilator-associated pneumonia (VAP) after percutaneous tracheostomy. Tracheostomy is an elective surgical procedure in patients with contaminated tracheal mucosa (present in all intubated patients). Therefore, we believe that administration of a β-lactam in the interval of 2 h before the time of surgical incision is a correct indication.

Antimicrobial prophylaxis should cover potential pathogens to decrease surgery-related infections. The most frequent isolates colonizing our patients prior to tracheotomy were nonfermentative Gram-negative bacilli, with Pseudomonas aeruginosa being identified as the most frequent responsible pathogen. Another patient acquired bacteremia by P aeruginosa during the procedure. Based on these findings, we suggested that surgical antimicrobials prescribed for tracheostomy prophylaxis in intubated patients should be active against P aeruginosa.

Dr. Schultz also expressed concern that the incidence of VAP in patients with tracheotomy was not compared to patients not receiving a tracheostomy. The overall incidence of VAP in our ICU was 9.6% of intubated patients in the study period. In the current article, 18.1% of patients acquired VAP after percutaneous tracheostomy. These episodes occurred a median of 7 days after intubation, and most episodes occurred within the first 5 days after the procedure (Table 2). This percentage notably exceed the < 1% cumulative risk of acquiring pneumonia per day of mechanical ventilation, which is considered standard in intubated patients.

Finally, Dr. Schultz indicates that antibiotic use in many patients before the procedure may have predisposed to the high incidence of VAP. However, in a cohort study focusing on episodes of pneumonia, prior antibiotic use showed a protective effect (relative risk, 0.1; 95% confidence interval, 0.01 to 0.71) within the first days after intubation. These findings agree with observations reported by Sirvent et al using a prophylactic antibiotic approach. Similarly, Cook et al estimated that exposure to antibiotics was associated with a risk ratio of 0.37 (95% confidence interval, 0.27 to 0.51) for development of VAP. A recent review article by Bonten et al confirmed these reports. Antibiotic exposure protects against pneumonia development within the first days of the intubation manipulation, especially...
against flora present in the colonized airways, suggesting that risk factors vary depending on the exposure to risk (ie, length of ventilation).8

Our opinion on antimicrobial prophylaxis for VAP has been clearly stated in a recent editorial,9 and a randomized clinical trial (ventilation).8 In their discussion about complications, Diaz O, Diaz E, Rello J. Risk factors for pneumonia in the intubated patient. Infect Dis Clin North Am 2003; 17:697–705 suggests that prescription of a single dose of an antipseudomonal agent prior to the percutaneous tracheotomy is the most pertinent policy.

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Surgical Stress in ARDS Open-Lung Biopsy

To the Editor:

We read with great interest the recent case series by Patel and colleagues (January 2004).1 In their discussion about complications after open-lung biopsy in patients with ARDS, however, they did not refer to the contribution of surgical stress to ARDS. Major surgery, including cardiovascular surgery with cramping of the aorta and resulting in ischemia/reperfusion of the lower body, sometimes causes a systemic inflammatory response leading to the development of fatal organ-system dysfunction such as ARDS.2,3 Tumor necrosis factor or other cytokines and chemokines play important roles in systemic inflammatory response syndrome.4 Enhanced release of proinflammatory cytokines and chemokines results in a trigger for the production of numerous other inflammatory mediators such as nitric oxide, adhesion molecules, and eicosanoids.5 Rajimakers et al demonstrated the strong correlation between an increase in circulating interleukin-8 and pulmonary microvascular permeability related to aortic surgery. Indeed, we previously confirmed the pivotal roles of proinflammatory cytokines in murine acute lung injury induced by bacterial endotoxin, a similar condition for ARDS in humans.6

In particular, proinflammatory chemokines such as macrophage inflammatory protein-1, macrophage chemotactrant protein-1, and keratinocyte chemotactrant in the lung paralleled the magnitude of lung injury and neutrophilic inflammation in our experiments.7 Therefore, surgery itself may aggravate ARDS. As Patel and colleagues concluded, clinicians should give careful consideration to the selection of patients with ARDS.

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