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Antimicrobial Resistance's Clinical Impact: Finding New Solutions with Traditional

Methods

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DESCRIPTION

Patients infected with Multi Drug-Resistant (MDR) pathogens have a higher mortality rate than those infected with sensitive pathogens. In one study of ICU infection, the presence of infection caused by Acinetobacter species, *Pseudomonas aeruginosa*, or methicillin-resistant *Staphylococcus aureus* increased the risk of mortality. Possible explanations for this observation include the use of initially improper antibiotic therapy due to the presence of bacterial resistance; the possibility that bacterial resistance is simply a marker of severe dysthymia disease, and that poor outcomes are the result of the comorbid disease; and the presence of bacterial resistance as a marker of severe diagnosable disease; or increased virulence and severity of infection because of the presence of multidrug resistance itself. Knowing the mechanism of increased mortality has important implications is prevention of infection the only way to reduce the mortality of MDR infection or can we still improve outcomes if we optimize therapy when MDR infection is recognized.

A study revealed about the implications of carbapenem resistance on patients with hospital-acquired pneumonia (HAP) and Ventilator-associated pneumonia (VAP). A total of 1,059 carbapenem-resistant organisms were found in a large database of 8,969 patients with gram-negative HAP or VAP (per blood or respiratory cultures). *Aeruginosa* was the most common pathogen. Those with resistant organisms were more likely to receive inappropriate therapy than those with sensitive pathogens and they also had more severe comorbid illness. After adjusting for illness severity, they found no increased mortality for M D Reinfection, but they did find a longer length of stay and higher cost for patients with resistant pathogens. As a result, this study suggested that resistance did not directly contribute to mortality, especially after controlling for confounding factors; thus, proper infection management could still have a positive impact on outcomes

The study is notable for applying a unique, developed method that might be broadly implemented in big databases to patients with pneumonia in the ICU. The process involved developing a unique HAP/VAP algorithm that was then applied to the Premier database. The algorithm started by looking for individuals who had positive blood or respiratory tract cultures after the third day of hospitalization in HAP patients or three days of mechanical ventilation in VAP patients. The stability of these data, as well as their validation of conclusions acquired using more traditional methods, implies that developing algorithms to query existing databases as an alternative to time-consuming retrospective chart checks or prospective analyses is worthwhile.

Taking all of this information into account it appears that the increased mortality associated with antibiotic resistance is related to patient comorbidity and inappropriate therapy. We can reduce the risk of death by starting appropriate therapy as soon as possible. Most studies indicate that resistance does not increase organism virulence or serve as a direct cause of death. The implication of these findings is that, while we cannot prevent infection with resistant organisms, we can minimize their impact if we can anticipate their presence and use this information to initiate appropriate therapy. This gives hope that we will still be able to help these patients.