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Pharmacodynamic-Based Clinical Pathway for Empiric Antibiotic Choice in Patients with Ventilator-Associated Pneumonia.

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BACKGROUND: Because of the high frequency of multidrug resistant bacteria in our intensive care units (ICUs), we implemented a ventilator-associated pneumonia (VAP) clinical pathway based on unit-specific minimum inhibitory concentration (MIC) distributions and pharmacodynamic modeling in 3 of our ICUs.
METHODS: This was a prospective, observational evaluation with a historical control group in adult patients (n = 168) who met clinical and radiologic criteria for VAP. Monte Carlo simulation was used to determine antibiotic regimens having the greatest likelihood of achieving bactericidal exposures against Pseudomonas aeruginosa. Antibiotic regimens were incorporated into an ICU-specific computerized clinical pathway as empiric agents of choice.
RESULTS: Pharmacodynamic modeling found 3-hour infusions of cefepime 2 g every 8 hours or meropenem 2 g every 8 hours plus tobramycin and vancomycin would provide the greatest probability of empirically treating VAP in these ICUs. Infection-related mortality was reduced by 69% (8.5% vs 21.6%; P = .029), infection-related length of stay was shorter (11.7 +/- 8.1 vs 26.1 +/- 18.5; P < .001), and fewer superinfections were observed in patients treated on the pathway. A number of patients with nonsusceptible P aeruginosa were successfully treated with high-dose, 3-hour infusion regimens.
CONCLUSIONS: In our ICUs where multidrug resistant bacteria are common, an approach considering ICU-specific antibiotic MICs coupled with pharmacodynamic dosing strategies resulted in improved outcomes and shorter duration of treatments.

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