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Outcomes of Bacteremia due to *Pseudomonas aeruginosa* with Reduced Susceptibility to Piperacillin-Tazobactam: Implications on the Appropriateness of the Resistance Breakpoint.

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BACKGROUND: Bacteremia due to *Pseudomonas aeruginosa* is associated with grave clinical outcomes. Recent studies have emphasized the importance of appropriate empirical therapy, but controversy arises when piperacillin-tazobactam is used against isolates with reduced susceptibility.

METHODS: We performed a retrospective cohort study of pseudomonal bacteremia from 2002 to 2006. Patients were identified by the microbiology laboratory database, and pertinent clinical data (demographic characteristics, baseline Acute Physiology and Chronic Health Evaluation [APACHE] II scores, source of bacteremia, and therapy) were retrieved from the electronic medical records. All patients received appropriate empirical therapy within 24 h of positive culture results. Patients receiving piperacillin-tazobactam were compared with those receiving other agents (control subjects). The primary outcome was 30-day mortality from the first day of bacteremia.

RESULTS: A total of 34 bacteremia episodes were identified involving isolates with reduced susceptibility to piperacillin-tazobactam (minimum inhibitory concentration, 32 or 64 mg/L, reported as susceptible); piperacillin-tazobactam was empirically given in 7 episodes. There was no significant difference in baseline characteristics between the 2 groups. Thirty-day mortality was found to be 85.7% in the piperacillin-tazobactam group and 22.2% in the control group ($P = .004$). Time to hospital mortality was also found to be shorter in the piperacillin-tazobactam group ($P < .001$). In the multivariate analysis, 30-day mortality was found to be associated with empirical piperacillin-tazobactam therapy (odds ratio, 220.5; 95% confidence interval, 3.8-12707.4; $P = .009$), after adjustment for differences in age and APACHE II score.

CONCLUSIONS: In *P. aeruginosa* bacteremia due to isolates with reduced piperacillin-tazobactam susceptibility, empirical piperacillin-tazobactam therapy was associated with increased mortality. Additional studies are warranted to examine the appropriateness of the current Clinical Laboratory Standards Institute resistance breakpoint of piperacillin-tazobactam.

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