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438

SAFETY AND EFFICACY OF CEFEPIME INTRAVENOUS PUSH VERSUS PIGGYBACK IN GRAM-NEGATIVE BACTEREMIA

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INTRODUCTION: Gram-negative infections including bacteremia are a major cause of inpatient mortality. Optimizing management is key to improving outcomes. Beta-lactams exhibit optimal antibacterial effects based on the time free concentrations exceed an organism's minimum inhibitory concentration. Limited data exists assessing outcomes using beta-lactams as intravenous push (IVP) compared to intravenous piggyback (IVPB) in serious infections. This study's purpose was to compare safety and efficacy of cefepime administered IVP versus IVPB in gram-negative bacteremia.

METHODS: This was an IRB-approved, retrospective cohort of patients hospitalized January 2014 to December 2021 and administered cefepime for >48 hours for gram-negative bacteremia involving Pseudomonas aeruginosa or AmpC beta-lactamase producing bacteria. Two groups were included: one of patients who received cefepime IVPB and the second of patients who received cefepime IVP. The primary outcome was a desirability of outcome ranking (DOOR) on a five-point ordinal scale including clinical cure (no recurrent bacteremia of initial pathogen, antibiotic escalation, or 30-day in-hospital mortality) and neurologic adverse effects during cefepime treatment up to 30 days inpatient or at discharge. Secondary outcomes included antibiotic escalation, time to defervescence, vasopressor use, and in-hospital mortality. A sample of 127 patients per group provided 80% power. Data was analyzed using measures of central tendency and variability, chi-square, student's T test, and Mann-Whitney U.

RESULTS: A total 254 patients were included with 127 per group. DOOR with clinical cure was similar between the IVPB and IVP groups (105 (82.7%) vs. 104 (81.9%); P=0.656). Escalation of therapy was the most common reason for clinical failure in both the IVPB and IVP groups (17 (13.4%) vs. 18 (14.2%); P=0.856). More patients in the IVP group required vasopressors (13 (10.2%) vs. 28 (22.0%); P=0.011). No difference was found in time to defervescence or in-hospital mortality.

CONCLUSIONS: When compared to cefepime IVPB in gram-negative bacteremia, treatment with IVP showed no significant difference in instances of clinical cure or adverse effects. Further research in a more severely ill population is needed to evaluate safety and efficacy of cefepime IVPB versus IVP.

439

TIME TO FIRST ANTIBIOTICS ADMINISTRATION IN THE ICU

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INTRODUCTION: The Surviving Sepsis Guidelines recommend IV antibiotics (ABX) be administered within 1 hour to patients with sepsis or septic shock. Delays in ABX administration in this patient population have been shown to increase mortality. We sought to determine the time to first IV ABX in ICU patients and to identify barriers resulting in delayed IV ABX administration.

METHODS: This was an IRB-approved retrospective review conducted between May 2021 and July 2021 involving adult patients across three ICUs (2 medical and 1 surgical) at an academic medical center. All patients who received a first-dose IV ABX in the ICU were included. Descriptive statistics were used to characterize the data. Mann-Whitney U test was used to compare the median times to administration between IV ABX dispensed from an automated dispensing cabinet (ADC) versus those from the pharmacy (PHARM).

RESULTS: A total of 250 first IV ABX doses (84% MICU and 16% SICU) in 90 patients were included. There were an average of 2.8 first doses of IV ABX per patient during the study period, half of which were dispensed from ADC and half from PHARM. The median time from order input to patient administration (n=211) was 68 min (40-109). The median time from order input to patient administration was longer if the IV ABX was dispensed from PHARM vs ADC [89 min (60-128) vs 54 min (29-76); p< 0.001]. Vancomycin also had a longer median time from order input to administration if dispensed from PHARM vs ADC [92 min (58-154) vs 39 min (24-71); p< 0.001]. A total of 88 IV ABX were dispensed within 60 min, with 82% from ADC vs 18% from PHARM, 81 ABX were dispensed within 60-120 min, with 65% from ADC vs 35% from PHARM, and 42 IV ABX were administered >120 min, with 59% from ADC vs 41% from PHARM ($X2$=9.42; p=0.009).

CONCLUSIONS: The median time to IV ABX administration in the ICU was near recommendations from guidelines. One limitation was the inability to classify patients as having sepsis or septic shock. Delays in time to IV ABX administration were primarily observed with medications dispensed by PHARM as compared to ADC.