Comparative-Effectiveness of Ceftaroline and Daptomycin as First-line Therapy for Patients with Bacteremia or Sepsis Admitted to Hospitals in the United States Veterans Health Care System


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ABSTRACT

BACKGROUND: Bacteremias and sepsis are on the rise, and evidence to support specific drugs for treatment is lacking. This study compared patient mortality and hospital readmission for patients with bacteremia or sepsis who received ceftaroline or daptomycin as first-line therapy.

METHODOLOGY: We conducted a retrospective cohort study of patients (age ≥18) admitted to hospitals in the United States Veterans Health Care System, with bacteremia or sepsis during October 1, 2010, and September 30, 2014, who received ceftaroline or daptomycin as first-line therapy for bacteremia or sepsis. Patients who received other agents, or who received ceftaroline or daptomycin as second-line therapy, were excluded. Chi-Square, Fisher’s exact, and Wilcoxon Rank Sum tests were used to compare baseline characteristics. Multivariate logistic regression was used to compare patient outcomes. Model covariates were those with p-value < 0.10.

RESULTS: The study took place between October 1, 2010 and September 30, 2014. Variance determined prior to study initiation included:

- Patient characteristics (age, race, Hispanic ethnicity, comorbidities, prior medications, determinations made within 24 h)
- Treatment setting (clinic, hospital ward, intensive care unit [ICU])
- Clinical signs and symptoms (line of therapy, dose, duration, infection)
- Treatment outcomes (length of stay, patient mortality, readmission)
- International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) and Clinical Classifications Software (CCS) codes were utilized to evaluate outcomes.

DATA COLLECTION AND DEFINITIONS:

- Inclusion criteria: Patients aged ≥18 treated with ceftaroline or daptomycin as first-line therapy for bacteremia and/or sepsis within the Veteran Affairs Health Care System.
- Exclusion criteria: Patients who received both study drugs.

DISCUSSION

This study demonstrated that, in this patient population, ceftaroline was more effective than daptomycin for the treatment of bacteremia and/or sepsis. No significant differences were found for 30-day, 60-day, or 90-day mortality (28% vs. 20%, p=0.10; 61% vs. 60%, p=0.76; and 90% vs. 90%, p=0.93), respectively. Differences in the rate of hospital readmission were observed at 30 days (39% vs. 30%, p=0.10), 60 days (63% vs. 55%, p=0.15), and 90 days (75% vs. 90%, p=0.55). The study found that patients treated with ceftaroline were less likely than those treated with daptomycin to be readmitted to the hospital (OR, 95% CI: 0.54, 0.29 – 0.99). In multivariate models with all divergent baseline characteristics included as variables in the multivariable model, patients treated with ceftaroline were less likely than those treated with daptomycin to be readmitted to the hospital (OR, 95% CI: 0.42, 0.23 – 0.75). The study identified Charlson combined age-comorbidity index as a higher baseline Charlson combined age-comorbidity index, indicating greater probability of treatment failure related to underlying disease. Lower mortality would have been expected in the daptomycin treatment arm, yet was found in the ceftaroline treatment arm.

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