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Evaluation of the Impact of an Antibiotic Time-out for Transition of IV Vancomycin to Oral Linezolid in Hospitalized Patients

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Abstract

Title: Evaluation of the Impact of an Antibiotic Time-out for Transition of IV Vancomycin to Oral Linezolid in Hospitalized Patients

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Background: Oral linezolid is a broad-spectrum oxazolidinone antibiotic that offers advantages compared to intravenous (IV) vancomycin including no requirement for therapeutic drug monitoring, no need for home health or peripherally inserted central catheter (PICC) line placement, and opportunities for earlier hospital discharge due to the ease of continuing therapy outpatient. A medication use evaluation investigated if opportunities existed for oral linezolid over IV vancomycin among a randomized cohort of 100 patients initiated on IV vancomycin. Reviewers identified 15 patients who were candidates for transition to oral linezolid and calculated a potential cost avoidance of \$125 per day of antibiotic therapy. The purpose of this study is to assess the feasibility of implementing an interdisciplinary approach for transitioning IV vancomycin to oral linezolid based on pharmacist-led transition criteria.

Methods: This is an IRB-reviewed, single-center, quasi-experimental study at Baptist Hospital of Miami, a 900-bed tertiary community hospital. Included patients were >18 years old, receiving IV vancomycin for >48 hours, and admitted between January 10, 2023 and March 31, 2023. Patients were excluded if they had an active vasopressor order, were immunocompromised, or if the patient was receiving antibiotics for meningitis, endocarditis, febrile neutropenia, or surgical prophylaxis. A pharmacy resident was on-call to assess for oral linezolid candidates using antibiotic timeout criteria and intervened as appropriate. Continuous and categorical variables were evaluated using the Mann-Whitney U test and Fisher's exact test, respectively. The primary outcome was total cost avoidance in patients transitioned from IV vancomycin to oral linezolid. Secondary outcomes included median hospital length of stay, median antibiotic treatment days, and incidence of thrombocytopenia and acute kidney injury, and pharmacist intervention acceptance rate.

Results: Investigators screened 317 patients for study inclusion and 94 patients met criteria. 66 (70%) patients met pharmacist-driven criteria for IV vancomycin to oral linezolid transition, with a total of 20 (30%) patients transitioned. There were 27 pharmacist interventions attempted, 15 interventions were accepted for transition to linezolid therapy and 5 interventions resulted in de-escalation to reduced spectrum antibiotic coverage, leading to a 74% provider acceptance rate. IV vancomycin therapy was continued in 31 patients and alternative therapy was selected for 15 patients. The total cost avoidance because of the transition to linezolid therapy was \$5,538, with a total of \$21 and \$70 saved per inpatient and outpatient antibiotic treatment day, respectively. Median length of antibiotic treatment days was 6 days between both groups ($p=0.3524$). No statistically significant differences were observed between length of stay, length of antibiotic treatment days, or safety outcomes between the 2 groups. Acute kidney injury occurred in 1 patient receiving linezolid and 1 patient receiving IV vancomycin. Thrombocytopenia, defined as a >50% drop in platelet count from baseline, occurred in 1 patient receiving provider-driven linezolid therapy.

Conclusion: Pharmacist-driven transition criteria from IV vancomycin to linezolid therapy resulted in a positive cost avoidance strategy, with similar effect on hospital antibiotic treatment days and no difference in incidence of adverse effects. These results demonstrate the practicality of a pharmacist prospective antibiotic timeout and intervention strategy for patients receiving empiric or targeted Methicillin-resistant *Staphylococcus aureus* (MRSA) therapy.