Characterization of Inappropriate Antimicrobial Therapy Following Changes in Antimicrobial Stewardship Strategies

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Abstract
Background: The traditional antimicrobial stewardship approach at the University of California Davis Medical Center (UCDMC) emphasized prior authorization. In 2013, UCDMC transitioned to a prospective audit with intervention and feedback model and de-restricted several antimicrobials, including cefepime, ceftazidime, piperacillin-tazobactam (PTZ), micafungin, and fluconazole. Our aim was to determine if prescription rates increased for the de-restricted antimicrobials following the stewardship strategy change.

Methods: We identified inpatient orders for the de-restricted antimicrobials using a retrospective cohort design. The pre- and post-periods examined were 10/1/12-12/31/12 and 10/1/13-12/31/13, respectively. Inclusion criteria were age ≥ 18 years, hospital admission, and receipt of >1 dose of the select agent following patient admission. Patients were excluded if the agents were recommended by the Infectious Diseases service or initiated by an outside facility. Appropriate use was assessed based on antimicrobial spectrum of activity and conformity with national or institutional guidelines.

Results: Subsequent to antimicrobial de-restriction, prescription rates per 1000 patient-days increased by 106% for PTZ and 64% for micafungin, but decreased by 7% for cefepime and 36% for fluconazole. A trend toward increased inappropriate PTZ (n = 168) prescribing was observed for several physician services, including medical intensivists (8% vs 30%; p = 0.127), hospitalists (0% vs 25%; p = 0.147), gastroenterology (0% vs 40%; p = 0.444), cardiothoracic surgery (13% vs 60%; p = 0.217), vascular surgery (22% vs 50%; p = 0.491), and orthopedic surgery (20% vs 33%; p = 0.604). Increased inappropriate PTZ prescribing was observed for pulmonary (10% vs 43%; p = 0.033), abdominal (10% vs 36%; p = 0.515), and pelvic (0% vs 25%; p = 0.515) infections. Rates of inappropriate micafungin (n = 16) prescribing did not change.

Conclusions: Our comparison of prescribing practices identified several services and infection types that may merit intervention on PTZ selection. Continued characterization of prescribing practices following changes in stewardship strategies can identify targets for enhanced stewardship efforts.

Goal
To determine the best allocation of antimicrobial stewardship program (ASP) resources to streamline stewardship processes and antimicrobial utilization.