Antimicrobial Stewardship Program Interventions Targeting Intravenous Vancomycin Use at a Community Hospital Improves Prescribing and Safety

Ronald Kendall, PharmD & Asgar Boxwalla, MD
Henry Ford Wyandotte Hospital

Abstract

• Key changes to vancomycin guidelines included:
  • Education regarding patients with difficult-to-estimate creatinine clearances (conditions with false low or high creatinine concentrations)
  • More conservative empiric dosing nomogram
  • Information regarding trough monitoring underestimating the true 24-hour area-under-the-curve by up to 33% and subsequently using clinical judgment to not increase vancomycin dose just to meet the trough goal in patients

• Additional changes implemented:
  • Formal system ASP campaign “Curb Vancomycin Use” with top 10 tips and vancomycin days of therapy/1000 patient days available on website
  • Respiratory culture comment updated from “commensal flora only” to “Commensal respiratory flora: No MRSA/S. aureus or P. aeruginosa”
  • Procalcitonin testing made available and guidelines for use created and distributed
  • Pharmacist practice model redesigned
    • From centralized to decentralized with physical pharmacist presence on each unit 7 days per week on first shift
    • Expectation created for each pharmacist to assist ID pharmacist with ASP functions, with emphasis on making “face-to-face” recommendations to providers

Results

• From October 2015 through March 2018 there were 1149 vancomycin-related interventions attempted by the ASP. Intervention types included:
  • De-escalation off vancomycin
  • No indication for antibiotics, recommend to discontinue
  • Stop vancomycin; duration of therapy sufficient
  • Initiate vancomycin therapy
  • Dose optimization by the ID pharmacist (done per protocol)

• Approximately 85% of non-dosing interventions accepted by prescribers

• Frequency of each time of attempted intervention in table below:

VAN Use declined from a peak quarterly use of 119 DOT/1000 PD to a minimum of 74 DOT/1000 PD (37.8% decrease).

• AKI was defined as an increase of ≥ 0.5 mg/dL in serum creatinine or 50% increase from baseline in all hospitalized patients with baseline <2 mg/dL. AKI rate declined from a peak of 9 AKI/1000 PD to a minimum of 4 AKI/1000 PD.

• Combined DOT/1000 PD for VAN alternatives (daptomycin, linezolid, and ceftaroline) remained stable and less than 10 for the entire study period, indicating the decrease in VAN usage was not due to increased use of VAN alternatives.

Conclusion, Keys to Success, and Future Direction

• ASP initiatives, prescriber and pharmacist education, and prospective audit and feedback by an ID pharmacist was associated with reduced VAN use and reduction in overall AKI at a community hospital.

• After creation of a new VAN dosing guideline, auditing dosing and providing feedback to the dosing pharmacist created a culture of accountability and education.

• Face-to-face antimicrobial stewardship recommendations seemed to accepted more frequently and in a more timely manner than making recommendations via pager or progress note in the electronic medical record.

• Future directions to decrease VAN use further include the use of MRSA nares swabs to discontinue vancomycin for lower respiratory tract infections when nares are MRSA negative and the creation of an antibiotic duration column in the electronic medical record patient list to help prescribers and pharmacists identify excessive durations of therapy.

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