Assessment of Antimicrobial Susceptibility Testing Profiles of Urine Isolates from Veterans to Guide Empiric Therapy for Suspected Urinary Tract Infection

Ketzela J. Marsh¹, Lesley Mundy², John Holter², and James R. Johnson¹,²
¹University of Minnesota, Minneapolis, MN; ²Minneapolis Veterans Affairs Medical Center, Minneapolis, MN

Background

- Urinary tract infection (UTI) is common among patients at Veterans Affairs Medical Centers (VAMCs), many of whom are elderly men with underlying medical or urological problems.
- Most UTI treatment guidelines address uncomplicated UTI in women and presume knowledge of local antimicrobial susceptibility testing (AST) patterns for uropathogens¹
  - Local patterns are often unknown, or are inferred from *E. coli*²
- To inform selection of empiric therapy for UTI at our VAMC, we compiled AST data for one year’s urine isolates

Methods

- We compiled AST results (from a bioMerieux VITEK® instrument) for the 2,494 significant urine isolates from the Minneapolis VAMC clinical microbiology laboratory from June 1, 2013 through May 31, 2014.
- For “drug-bug” combinations that were not tested, we imputed results based on local or published data, and/or expert opinion
- Cumulative % susceptible was then calculated for 25 relevant antimicrobial agents, overall and stratified by Gram stain group and clinical site (intensive care unit, inpatient, outpatient, community residential centers, or extended care center)
- In ambiguous situations susceptibility was analyzed as both 100% and 0% for:
  - *Enterococcus* and TMP/SMX susceptibility
  - Proteus spp., *Staph. saprophyticus*, and fosfomycin (FOF) susceptibility
- and as both 50% and 0% for:
  - *Pseudomonas aeruginosa* and fosfomycin susceptibility

Results

- The 2,494 urine isolates included 946 Gram-positive and 1,548 Gram-negative organisms.
- Species distribution varied significantly by site (Figure 1):
  - *Enterococcus* and other Gram-positives were prevalent at each site and overall (14% and 23%, respectively)
  - *E. coli* represented only 9-37% depending on site and overall 27%
- Cumulative AST profiles varied significantly (not shown):
  - by Gram stain group
  - between *E. coli* and other Gram-negatives
  - by clinical site
- No tested oral agent provided ≥ 80% overall susceptibility (Figure 2):
  - Imputation for fosfomycin suggested 82-95% susceptibility overall

Conclusions

- Among urine isolates from veterans, *E. coli* was a minor contributor and a poor surrogate for total population AST profiles.
- The only agent that provided ≥ 80% susceptibility overall was fosfomycin
  - Fosfomycin may be an important option for empiric lower UTI therapy for veterans
- Urine isolate-specific antibiograms that reflect local AST data, stratified by Gram stain group and clinical site, could improve empirical UTI therapy for veterans, as could the performance of urine Gram stains.

Contact:
Ketzela Marsh, MD
Fellow, Adult and Pediatric Infectious Disease
marsh846@umn.edu

References: