Prospective Evaluation of Antibiotic Resistance Patterns in Emergency Department Patients with Urinary Tract Infections

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Research Hypothesis:
Patient risk factors can be identified that are associated with an increased risk of antimicrobial resistance of common UTI pathogens among adult women.

Significance:
Many reports have documented increasing antimicrobial resistance of common bacteria that cause UTIs. Factors associated with increased resistance in these studies include age, gender, geographic location, diabetes mellitus, recent hospitalization, current use of any antibiotic and recent use of TMP/SMX. Other factors associated with resistance of Escherichia coli (E. coli) to TMP/SMX have been: diapered children in day-care; travel to Mexico; being: diapered children in day-care; travel to Mexico; current use of antibiotics or recent use of TMP/SMX.

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Methods:
Study Design:
This was a prospective observational cohort study of all patients evaluated for nine months and discharged from the ED who did not have exclusion criteria and who had a positive urine culture.

Inclusion criteria:
Adult females (>18 yo). Positive urine culture was defined as ≥ 105 colony forming units (cfu) per milliliter (ml) of a single urinary pathogen from a clean catch urine specimen; or, ≥ 100 cfu/ml of a single urinary pathogen from a non-indwelling urinary catheter specimen; or, multiple pathogenic organisms of ≥ 10 cfu/ml from a non-indwelling urinary catheter specimen.

Exclusion criteria:
The following patients were excluded: males; pregnant patients; patients with indwelling urinary catheters; patients transferred from another hospital; patients admitted to the hospital.

Predictor variables:
Age, residence in a long term care facility, hospitalization within the previous 6 months, history of at least 2 previous UTIs, timing of last UTI (<1 year or >1 year) current antibiotic usage, antibiotic usage within 3 months; diabetes mellitus, recent hospitalization, geographic location, race, gender, current use of any antibiotic and current use of TMP/SMX.

Outcome variables:
The main outcome variable was the presence or absence of resistance of the bacteria identified by the urine culture to TMP/SMX.

Data sources:
The ED patient record, laboratory results of urine culture and antimicrobial susceptibility results and sensitivity tests of a telephone survey were used.

Results:
TMP/SMX resistance was 17.6% (18 of 102 total gram negative organisms). No factors were significantly associated with TMP/SMX resistance.

Conclusion:
TMP/SMX resistance is common among adult females discharged from the ED with UTI. Since no patient variables were associated with resistant organisms, it is difficult to predict TMP/SMX resistance. Although empiric treatment with CIPRO is most often prescribed, less expensive antibiotics with more selective coverage, such as Nitrofurantoin, may be more appropriate in settings with high TMP/SMX resistance and may avoid development of CIPRO resistance.