Evaluating the need for Antimicrobial Stewardship Efforts in the Outpatient Setting: A Focus on Appropriate Prescribing for Urinary Tract Infections

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Abstract

Background: Increasing antimicrobial resistance is a major threat to public health. Antimicrobial stewardship programs (ASPs) have shown to reduce antimicrobial utilization and resistance, improve patient outcomes, and decrease healthcare-associated infections. Most ASPs target antimicrobial use in the acute care setting; however, the majority of antimicrobial prescribing occurs at ambulatory care sites making this a critical target for ASPs. We describe a baseline needs assessment for antimicrobial stewardship efforts focused on appropriate diagnosis and prescribing for urinary tract infections (UTIs) at ambulatory care sites.

Methods: A retrospective cohort study was conducted of adult patients treated at three ambulatory care sites providing express care between January 1 and September 30, 2014 to assess guideline-concordant prescribing (GCP) of empiric therapy for UTIs. Patients were eligible for inclusion if they had a diagnosis of pyuria, pyuria, cystitis, pyelonephritis or asymptomatic bacteriuria. Patients were excluded if they were pregnant, neuentration severity index (NSI) of renal transplant. Data collected included patient characteristics, diagnostic characteristics, appropriateness of therapy, and patient outcomes including officialexists within 30 days and adverse effects such as Clostridium difficile infection. Therapy was considered GCP if it met national and local health system guidelines for empiric therapy based on drug selection, dose, and duration of therapy.

Results: A total of 1638 patients were eligible for the study. 388 patients were randomly selected for inclusion. Patients were mostly female (91.2%) with an average age of 50 ± 18 years. 376 patients (96.9%) had a dipstick urinalysis performed in the outpatient office while 249 (64.2%) had a urine culture performed. Escherichia coli was the most commonly identified organism, n = 150 (43.7%), while 95 patients (26.8%) had a negative culture. 294 patients (74.5%) were prescribed antibiotics. The most common reason for not meeting GCP were diagnosis with inappropriate antimicrobial prescribing (31%). Baseline and quarterly report cards to individual providers were used to support ASP efforts. The most common reasons for not meeting GCP were use of non-preferred antibiotic (31%) and prolonged duration of therapy (97%).

Conclusions: This study supports the need for outpatient ASP interventions targeting appropriate UTI diagnosis and prescribing.

Methods

Primary objective: • Assess appropriateness of outpatient antibiotic prescribing for UTIs prior to educational intervention according to local susceptibility and national prescribing guidelines.

Study Setting: • Mercy Health Physician Partners in Grand Rapids, Michigan • 21 sites with over 500 physicians

Study Design: • Retrospective cohort study assessing baseline diagnoses and prescribing habits and comparing these between each site

Inclusion Criteria

Exclusion Criteria

• Diagnosis of: Asymptomatic bacteriuria, pyuria, cystitis, UTI, dysuria, pyelonephritis, or CA-UTI
• ≤ 18 years of age

• Pregnancy
• Pre-operative screening cultures
• Diagnosis of candiduria
• Neuropenia (ANC < 1000)
• Renal transplant recipient
• < 18 years of age

• Data Collected
• Patient characteristics
- Demographics, diagnosis, urinary symptoms

• Microbiology
- Urinalysis, urine culture (UCx) results

• Antimicrobial therapy
- Empiric antibiotic choice, dose, and duration, susceptibility data

• Clinical outcomes
- Guideline concordant prescribing (GCP)
- Revisit to outpatient provider or ED/hospital admission within 30 days
- Clostridium difficile infection (CDI)

• Analysis
- Descriptive statistics were used to characterize each group
- Nominal data was compared with the Chi-square test or Fisher’s Exact test when appropriate, ordinal data was compared with the Students t test

Results

Patient Characteristics

<table>
<thead>
<tr>
<th>Site A (n=128)</th>
<th>Site B (n=130)</th>
<th>Site C (n=130)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female, n (%)</td>
<td>108 (84.4)</td>
<td>127 (97.7)</td>
</tr>
<tr>
<td>Age, mean (range)</td>
<td>55 (18 – 85)</td>
<td>51 (21 – 94)</td>
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</tbody>
</table>

Patient Symptoms

<table>
<thead>
<tr>
<th>Symptomatic, n (%)</th>
<th>Asymptomatic, n (%)</th>
</tr>
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<tbody>
<tr>
<td>Site A (n=128)</td>
<td>122 (95)</td>
</tr>
<tr>
<td>Site B (n=130)</td>
<td>130 (100)</td>
</tr>
<tr>
<td>Site C (n=130)</td>
<td>117 (90)</td>
</tr>
</tbody>
</table>

Laboratory/Diagnostics

<table>
<thead>
<tr>
<th>U/A Performed, n (%)</th>
<th>U/A Positive, n (%)</th>
<th>U/CX Performed, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site A (n=128)</td>
<td>122 (95.3)</td>
<td>80 (65.6)</td>
</tr>
<tr>
<td>Site B (n=130)</td>
<td>129 (99.2)</td>
<td>97 (75.2)</td>
</tr>
<tr>
<td>Site C (n=130)</td>
<td>125 (96.2)</td>
<td>94 (75.2)</td>
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</tbody>
</table>

Microbiologic & Treatment Characteristics

<table>
<thead>
<tr>
<th>Site A (n=128)</th>
<th>Site B (n=130)</th>
<th>Site C (n=130)</th>
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</tr>
<tr>
<td>Site B (n=130)</td>
<td>80 (65.6)</td>
<td>97 (75.2)</td>
</tr>
<tr>
<td>Site C (n=130)</td>
<td>80 (62.5)</td>
<td>71 (54.6)</td>
</tr>
</tbody>
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Conclusions

• Despite the high prevalence of patients symptoms, dipstick U/A and UCx were performed despite guideline recommendations against these in the majority of the population
• Educational intervention could reduce inappropriate testing
• Percentage of GCP was low.
• Heavy use of FQ and SMX/TMP over NTF
• Prolonged durations of therapy
• This study supports the need for outpatient ASP interventions targeting appropriate UTI diagnosis and prescribing

Future Directions

• Outpatient UTI stewardship audit and feedback program
• Education April 2015 and data collection began June 2015
• Baseline and quarterly report cards to individual providers
• Percent concordance with institutional guideline (below):

References