Assessing the Impact of an Adult Emergency Department Antibiotic Guide and Education on Emergency Medicine Residents for Judicious Empiric Therapy Selection

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Purpose
To evaluate the impact of an emergency department antibiotic guide and education on emergency medicine residents for judicious empiric therapy selection

Background
- Optimal antibiotic selection in the Emergency Department (ED) is imperative both for successful treatment and limiting antibiotic resistance. Antimicrobial stewardship programs in the ED have been successfully implemented in several institutions throughout the country through collaborations with Pharmacy, the ED, and Infectious Diseases departments.1
- May and colleagues discuss the importance of ED-specific empiric antibiotic guidelines. As national guidelines cannot account for local resistance patterns for both in and outpatient drug regimens, it is essential for providers to tailor recommendations to their specific institutional needs. These guidelines also create the opportunity to optimize dosing as well as potentially shorten duration of antibiotic therapy to the minimal duration necessary. In this article, May and colleagues also discuss in detail the need for active educational programs to “promote dialogue and increase likelihood of clinician engagement which is fundamental to practice change”. These educational strategies enhance the use of ED specific recommendations, as to ensure full understanding as to how each recommendation was developed.2
- The Pharmacy, adult ED, and adult Infectious Diseases (ID) departments at our institution collaborated to form ED specific empiric antibiotic recommendations for several common disease states. The Infectious Diseases Society of America (IDSA) guidelines for each disease state covered were tailored based on local resistance patterns and formulary availability. We evaluated the impact of the ED antibiotic guide and education on emergency medicine (EM) residents for judicious empiric therapy selection

Objectives

Primary
- Compare overall pre and post ED empiric antibiotic guide implementation and education quiz results
- Secondary
  - Compare in-patient antibiotic quiz results before and after ED empiric antibiotic guide implementation and education
  - Compare out-patient antibiotic quiz results before and after ED empiric antibiotic guide implementation and education
  - Evaluate quiz results based on year of residency class

Methods

Study design
- IRB approved cross-sectional single center study with a pre and post design
- Inclusion criteria
  - Residents were included if they are present at a pre-established meeting (EM weekly conference), and if they are willing to take the quiz
- Exclusion criteria
  - Residents were excluded if they opt to not take the quiz, as it is voluntary
- Study population
  - The study population were the Emergency Medicine (EM) Residents. The EM Residency at HackensackUMC is an ACGME fully accredited PGY 1-2-3 program with 36 residents.
  - The 12 residents from each residency class will be offered the survey at EM weekly conference
- Verbal consent was obtained from all participants

Methods Continued

Intervention
- The empiric antibiotic drug card was distributed to all EM residents regardless of study participation
- The EM clinical Pharmacist provided education on recommendations over 3 one-hour sessions during EM weekly conference

Results

Quiz questions
- Pre-intervention quiz and post-intervention questions were identical, with a total of 20 questions, 10 inpatient based and 10 outpatient based
- The quiz contained a mixture of simple and complex case based questions that were tailored to match the antibiotic card that was used as the education tool
- The post-intervention quiz was offered to the same residency classes approximately six months after the pre-intervention quiz was offered
- All results were completely anonymous

Results Continued

Statistical analysis was performed: alpha = 0.025 (one sided analysis)

In total, 31 residents took the pre-intervention quiz, while 22 residents participated in the post-intervention quiz

Table 1: Demographics

<table>
<thead>
<tr>
<th>PGY 1</th>
<th>PGY 2</th>
<th>PGY 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>229/620</td>
<td>77/200</td>
<td>68/140</td>
<td>374/1060</td>
</tr>
</tbody>
</table>

Table 2: Comparison of Quiz Outcomes Across Evaluation Periods by Type of Question

<table>
<thead>
<tr>
<th>Sample</th>
<th>Pre-Evaluation</th>
<th>Post-Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>n correct/total questions</td>
<td>% correct</td>
<td>n correct/total questions</td>
</tr>
<tr>
<td>PGY1</td>
<td>85/240</td>
<td>35.42</td>
</tr>
<tr>
<td>PGY2</td>
<td>67/180</td>
<td>37.22</td>
</tr>
<tr>
<td>PGY3</td>
<td>77/200</td>
<td>38.50</td>
</tr>
<tr>
<td>Total</td>
<td>229/620</td>
<td>36.94</td>
</tr>
</tbody>
</table>

*One-tailed Fisher’s Exact Test

Table 3: Comparison of Quiz Outcomes Across Evaluation Periods

<table>
<thead>
<tr>
<th>Sample</th>
<th>Pre-Evaluation</th>
<th>Post-Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>n correct/total questions</td>
<td>% correct</td>
<td>n correct/total questions</td>
</tr>
<tr>
<td>PGY1</td>
<td>40/120</td>
<td>33.33</td>
</tr>
<tr>
<td>PGY2</td>
<td>39/90</td>
<td>43.33</td>
</tr>
<tr>
<td>PGY3</td>
<td>43/100</td>
<td>43.00</td>
</tr>
<tr>
<td>Total</td>
<td>123/310</td>
<td>39.68</td>
</tr>
</tbody>
</table>

Results were also analyzed to differentiate in-patient versus outpatient antibiotic selection

Results Continued

Discussion

- During the 6 month period, while education was being conducted, residents and providers requested an electronic version of the empiric antibiotic guide, which was then made available for them, but was not available throughout the whole time. This made the card more accessible during working hours in the ED
- Three 1 hour educational sessions were provided to the EM residents during their required conference time, however, all residents who took the quiz may not have been present for every session due to time off and alternate rotations
- Lower scores were overall identified on outpatient antibiotic selection, potentially due to limited education throughout residency overall when compared to inpatient selection
- Education may be needed continuously to further increase optimal selection of antibiotic therapy for both in and outpatient use
- Statistical analysis was performed on evaluation of question type (ie inpatient versus outpatient). No difference was shown per residency group, while statistical significance was seen in total due to small sample size of each individual group

Conclusion

- Overall, the education and antibiotic guide did improve EM resident quiz scores.
- Additional educational sessions and materials may be necessary to further improve empiric antibiotic selection, particularly for outpatient prescriptions

References


Disclosure

No authors have any conflicts to declare. For questions please contact: Gabrielle Procopio at gabrielle.procopio@hackensackmeridian.org