Financial impact of a regional antimicrobial stewardship cost saving initiative in a large integrated health care system

Van Nguyen
Colton Taylor
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Financial impact of a regional antimicrobial stewardship cost saving initiative in a large integrated health care system

Van Nguyen, PharmD; Colton Taylor, PharmD; Alyssa Christensen, PharmD, BCIDP; Brent Footer, PharmD, BCPS

Background

• Since 2017, antimicrobial stewardship is a Centers for Medicare & Medicaid Services (CMS) and The Joint Commission (JhC) requirement for all acute care hospitals, critical access hospitals, and nursing care centers.
• Given the current evidence supporting the utilization of extended-infusion beta-lactams, the system transitioned all its acute care facilities within the region to extended-infusion piperacillin/tazobactam (TZP) in March 2016.
• According to Bauer et al, the median length of stay and hospital costs were significantly less for patients admitted to the ICU who received extended-infusion cefepime for bacteremia and/or pneumonia.

Cost savings associated with reduced extended-areas to reduce costs in the future.


2020.


Cost savings associated with decrease in use of antimicrobial stewardship team resulted in

The purpose of this study was to evaluate financial impact of a regional cost saving initiative by the antimicrobial stewardship program for all acute care facilities within the region, and identify potential areas to reduce costs in the future.

The study looked at the following:

• Cost savings associated with reduced extended-infusion piperacillin/tazobactam administrations in 2020.
• Difference in overall days of therapy and antimicrobial-associated costs between 2019-2020.
• Cost savings associated with decrease in use of restricted antimicrobial agents between 2019-2020.
• Potential cost savings associated with reduction in hospital length of stay related to extended-infusion cephefime use in ICU patients for the treatment of Pseudomonas aeruginosa pneumonia.

Purpose

Methods

• Multi-site retrospective review of eight inpatient medical centers within the region of a large integrated healthcare system

TZP

TZP

18 years old who received >24 hours of TZP
TZP

TZP

18 years old who received >24 hours of TZP in ICU

P

P

P. aeruginosa respiratory sample

N = 25 for the region

Duration of therapy per encounter

On avg. sample 1 dose per day

Cost of each TZP premix bag was $10

Cost of each hospitalized day in 2020, excluding COVID-associated expenses was between $3611.16 - $8392.71/day, depending on facility

Cost difference between 2019 and 2020 associated with change in usage of pre-specified “restricted” antimicrobial agents, as well as total costs and days of therapy associated with overall antimicrobial usage, excluding for remdesivir, were collected through Tableau reporting system.

Results

• The initiative by the antimicrobial stewardship program has resulted in substantial cost savings for all covered inpatient facilities within the region.
• In 2020, the use of extended-infusion piperacillin/tazobactam resulted in saving $226,420 due to reduced administrations compared to traditional infusion.
• Decreased usage in antimicrobial agents that have been considered as “restricted” by the antimicrobial stewardship team resulted in $182,837 saved in 2020.
• Overall, $616,178 was saved in antimicrobial costs in 2020, after excluding costs attributed to remdesivir, due to 19,775 days reduction in overall days of therapy per 1000 patient days between 2019 and 2020.
• For patients who are admitted to the ICU for pneumonia due to P. aeruginosa requiring cephefime administration, transition to extended-infusion cefepime is anticipated to save between $138,584-5,385,842.5 depending on LOS reduction between 1-10 days.

Extended-infusion can optimize the time-dependent property of beta-lactams without the need for increased dose or more frequent administrations, therefore minimizing risk for development of adverse events. Given the growing prevalence of multidrug-resistant pathogens, optimizing the pharmacokinetic and pharmacodynamic parameters of current antibiotics to improve therapeutic efficacy is prudent in improving clinical outcomes, while maintaining antimicrobial sensitivity in the community and minimizing unnecessary costs. Based on current literature, the transition to extended-infusion cefepime in the treatment of P. aeruginosa pneumonia in patients requiring ICU admission may reduce hospital costs.

Table 1. Costs associated with hospital LOS in patients admitted to ICU on cefepime for Pseudomonas pneumonia in 2020

<table>
<thead>
<tr>
<th>Facility</th>
<th>Cost per LOS day</th>
<th>Mean LOS</th>
<th>Total LOS costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>$5,773.1</td>
<td>17</td>
<td>$98,142.70</td>
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<tr>
<td>Hospital B</td>
<td>$3,611.16</td>
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<td>$7,222.32</td>
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<tr>
<td>Hospital C</td>
<td>$8,392.71</td>
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<td>$226,603.17</td>
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<tr>
<td>Hospital G</td>
<td>$5,934.49</td>
<td>31</td>
<td>$173,429.19</td>
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<tr>
<td>Hospital H</td>
<td>$4,345.39</td>
<td>11</td>
<td>$47,799.29</td>
</tr>
<tr>
<td>Regional (n=25)</td>
<td>$5,943.37</td>
<td>18</td>
<td>$110,639.33</td>
</tr>
</tbody>
</table>

Figure 1. Cost savings associated with extended-infusion piperacillin/tazobactam in 2020

Figure 2. Cost savings associated with reduced restricted agents usage between 2019-2020

Results

References