From August 2019 to September 2019 the results of our DBM were reviewed by a pharmacist and interventions were pursued when appropriate. The culture, indication for antibiotic, antibiotics ordered, and potential for intervention was analyzed for each mismatch.

Each alert was documented as requiring an intervention or not. Those mismatches not resulting in an intervention were categorized as to why they were not helpful, such as contamination, colonization, or the intervention was already made. For the purposes of analyzing results, alerts were stratified into 6 different groups based on the type of culture. The groups were urine, blood, sputum, bone or bodily fluid, wound or tissues, and stool.

The study investigator was responsible for assessing each case, following up with the physician, and then determining if there was a true DBM. With a true DBM, the investigator intervened to ensure the appropriate antibiotics were initiated for the patient.

Methods

Introduction

Antimicrobial stewardship is a priority for hospitals, and utilizing a variety of generated reports can enhance stewardship activities. At AtlantiCare Regional Medical Center (ARMC), TheraDoc software is used to help optimize antimicrobial therapy. An alert evaluating antimicrobials and current cultures with susceptibilities is called drug-bug mismatch (DBM). The report identifies patients with a cultured organism that is not covered by their current antimicrobial treatment.

Purpose

The purpose of this study was to evaluate the utility of the DBM alert and determine whether or not an intervention was truly needed for patients identified as having a mismatch.

Evaluation of Drug-bug Mismatch Report and Impact on Antimicrobial Stewardship Interventions

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Results & Discussion

A total of 42 DBM alerts were analyzed from various sources, including 16 urine, 5 blood, 4 sputum, 4 bone or bodily fluid, 9 wound or tissue, and 1 stool culture (Figure 1). The DBM alerts include the patient’s culture result and current antimicrobial therapy (Figure 2).

Overall, 20 of 42 (48%) alerts resulted in an intervention by the pharmacist. Urine and sputum culture alerts required interventions at the lowest rate with resultant treatment interventions in 4 of 16 (25%) and 2 of 7 (29%) of those cases respectively (Table 1). Blood culture alerts were the most successful as all 5 alerts required an intervention. Alerts associated with wound or tissue cultures identified gaps in therapy as 6 of 9 (67%) cases required an intervention. Additionally, alerts due to positive bone or bodily fluid cultures resulted in interventions in 2 of 4 (50%) cases.

Colonization or contamination appeared to be the major cause of alerts that did not result in an intervention. Of the 42 alerts, 6 of them were the result of a contamination and 12 were the result of a colonization.

Additionally, treatment modification being made before the pharmacist could intervene was another cause of alerts that did not result in an intervention. This did not happen often, however, as only 4 of 42 alerts resulted in treatment modification prior to pharmacist intervention.

Conclusion

The drug-bug mismatch alert software can be a beneficial tool for pharmacists participating in antimicrobial stewardship activities. However, the alerts had varying value depending on the culture source at ARMC. If used appropriately, the DBM can be a valuable asset for an antimicrobial stewardship program.

Further modifications to our process in utilizing the DBM are warranted to enhance value and allocate time accordingly.

Table 1: Breakdown of Alert Results

<table>
<thead>
<tr>
<th>Culture Type</th>
<th>urine (16)</th>
<th>Blood (5)</th>
<th>Sputum (7)</th>
<th>Bone/Body fluid (4)</th>
<th>Wound/Tissue (9)</th>
<th>Stool (1)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alerts</td>
<td>16</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>Contaminants</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>6</td>
</tr>
<tr>
<td>Colonizations</td>
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<td>0</td>
<td>5</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Provider Modifications</td>
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<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Pharmacist Interventions</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>20</td>
</tr>
</tbody>
</table>

Figure 1: Percent of Alerts Resulting in Pharmacist Interventions (N=42)

Figure 2: Example of Drug-bug Mismatch Alert

Table: Breakdown of Alert Results