Comparison of Ambulatory Pump vs. Elastomeric Use for Continuous Nafcillin and Oxacillin from 2019-2021

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Background

Time dependent pharmacodynamics of beta-lactams should be optimized for efficacy. This can be accomplished through increasing dosing frequency or the use of continuous administration. Nafcillin and oxacillin were previously administered primarily via ambulatory pumps as they allow for intermittent dosing or continuous infusion.

A previous study by this organization compared compliance and costs for various methods of administration of intravenous antibiotics in home infusion, which demonstrated that patients prefer elastomeric pumps compared to other methods. The study also showed elastomeric pumps had the lowest number of missed doses, were more cost effective, and required shorter nurse teaching visits.

Elastomers can provide continuous administration of nafcillin and oxacillin, which provides greater flexibility to the patient as well as cost avoidance related to ambulatory pump management. To achieve improved standardization, updates were made to the prescription templates for these medications.

Methods

This project compared the use of ambulatory versus elastomeric pumps for nafcillin and oxacillin before and after implementation of standardized templates. Clinical outcomes, such as therapeutic failure, or both methods were also assessed.

Results

A total of 2,805 patients were included in the study. Elastomeric administration was the primary method accomplished through increasing dosing frequency or the use of continuous administration. Nafcillin and oxacillin were previously administered primarily via ambulatory pumps as they allow for intermittent dosing or continuous infusion.

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Table 1: Categorization of Medication Errors Reported Using the NCC MERP Index

<table>
<thead>
<tr>
<th>Category</th>
<th>Ambulatory Nafcillin</th>
<th>Elastomeric Nafcillin</th>
<th>Ambulatory Oxacillin</th>
<th>Elastomeric Oxacillin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Category B</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Category C</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Category D</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Events</td>
<td>8</td>
<td>11</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Total Patients</td>
<td>858</td>
<td>778</td>
<td>462</td>
<td>707</td>
</tr>
</tbody>
</table>

Discussions

The switch to elastomerics has been previously shown to increase patient compliance and decrease costs. The creation of standardized templates assisted in driving the change away from ambulatory pumps to elastomeric pumps for continuous infusion administration of oxacillin and nafcillin. Additional education may be warranted for elastomeric pumps to reduce medication errors.

Conclusion

The switch to elastomerics has been previously shown to increase patient compliance and decrease costs. The creation of standardized templates assisted in driving the change away from ambulatory pumps to elastomeric pumps for continuous infusion administration of oxacillin and nafcillin. Additional education may be warranted for elastomeric pumps to reduce medication errors.

References


Author disclosures

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