Effect of a Multidisciplinary Team Approach to Eradicate Central Line Associated Blood-Stream Infections (CLABSI)

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Authors

Comments

Poster presentation at the Society of Critical Care Medicine's 41st Critical Care Conference in Houston, Texas, February 4-8, 2012.
From 2004 to 2011 the rate of CLABSI declined significantly from 5.86 to 0.6 infections per 1000 catheter days (p<0.0001). There was a significant downward trend (0.4 fold decrease per year) in the incidence of PICC-related infections (p=0.009). From 2008 to 2009 catheter usage significantly increased whereas from 2010 to 2011 it dropped significantly (p=0.0015). However, the number of PICCS did not significantly change in frequency over time (Figure 2). Table 3 shows the longest CLABSI-free time and APACHE III scores for individual units. Microbiology data are presented in Table 4.

Discussion

Similar to other published reports, the primary finding of our study is that a multidisciplinary approach to the insertion and care of central venous catheters reduces the incidence of CLABSI. However, our study is different in several important ways from previous investigations. Other investigations included a single ICU that did not use antiseptic catheters28 or were hospital-wide studies with multiple ICUs (community hospitals versus tertiary medical centers). In addition to the study of the Prevention Guidelines for the Prevention of Intravascular Catheter-Related Bloodstream Infections (ICUs) and the Medical 2 ICU particularly similar units have much lower rate. We do not have ready explanation for this finding.

Our CVC utilization rate peaked in 2010 and decreased in 2011. This observation is most likely the result of better adherence to catheter removal when indicated and to an increasing reliance on PICCs. Use of a multimodal approach to CVC insertion and care reduces CLABSI by over 90%. Our ultimate goal is the complete eradication of CRLASI in our institution.

References


TABLE 1: Key Interventions and Achievements

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2008</td>
<td>Increased diligence in catheter insertion and care.</td>
</tr>
<tr>
<td>2008-2011</td>
<td>Increased use of antiseptic catheters.</td>
</tr>
</tbody>
</table>

TABLE 2: Definitions of CLABSI

- CLABSI: Central line-associated bloodstream infection
- PICC: Peripherally inserted central catheter
- CVC: Central venous catheter

TABLE 3: CLABSI-Free Time and APACHE III Scores

<table>
<thead>
<tr>
<th>Unit</th>
<th>CLABSI-Free Time (days)</th>
<th>APACHE III Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuro-Trauma</td>
<td>1,110</td>
<td>57.3</td>
</tr>
<tr>
<td>Cardiology</td>
<td>605</td>
<td>66.2</td>
</tr>
<tr>
<td>Cardiology</td>
<td>605</td>
<td>66.2</td>
</tr>
<tr>
<td>Med Surg</td>
<td>329</td>
<td>68.9</td>
</tr>
<tr>
<td>Med Surg</td>
<td>329</td>
<td>68.9</td>
</tr>
<tr>
<td>Medical/Surgical</td>
<td>432</td>
<td>59.6</td>
</tr>
<tr>
<td>Medical/Surgical</td>
<td>432</td>
<td>59.6</td>
</tr>
</tbody>
</table>

TABLE 4: Microbiology Data

<table>
<thead>
<tr>
<th>Organism</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus</td>
<td>100%</td>
</tr>
<tr>
<td>Enterococcus</td>
<td>80%</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>60%</td>
</tr>
<tr>
<td>Citrobacter</td>
<td>40%</td>
</tr>
</tbody>
</table>

Abstract # 583

Introduction: CLABSI remains a significant problem in the intensive care unit. Hypothesis: A multidisciplinary approach for the insertion and care of central venous catheters will result in significant reduction in rates of CLABSI. Methods: A Critical Care Operations Committee was formed to transform care in eight intensive care units (ICUs) at an academic medical center in 2004. This group took responsibility for changing existing policies, implementing new ones, and educating staff. A Slam Session on antimicrobial catheter care was held by the hospital epidemiologist and CVC days were tracked. Rates of CLABSI were followed from 2004 through 2011. The Spearman correlation coefficient was used for statistical evaluation. Results: CLABSI rates per 1000 catheter days declined dramatically from 2004 to 2011 (p<0.05): 2004: 5.86; 2005: 3.46; 2006: 3.74; 2007: 2.89; 2008: 1.34; 2009: 1.12; 2010: 0.84; 2011 (annualized): 0.49. One ICU has not had a CLABSI for over 3 years. Conclusions: A multimodal approach to CVC insertion and care reduces CLABSI by over 90%. Our ultimate goal is the complete eradication of CRLASI in our institution.

Discussion

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References