Abstract

Background: In 2015 the National Healthcare Safety Network (NHSN) definition of catheter-associated urinary tract infection (CAUTI) was modified to improve specificity and produce a measure that accurately identifies patients (pts) with CAUTI. However, presence of a concurrent alternate infection is not an exclusionary criteria for CAUTI. The goals of this study were to (a) estimate the impact of 2015 NHSN criteria on CAUTI rates in 2013-14 for intensive care units (ICU) and (b) determine if these estimated rates were consistent with the actual CAUTI rate in 2015 (c) determine the accuracy of 2015 criteria in classifying pts with CAUTI.

Methods: This retrospective study was done at an 800-bed teaching hospital (140 ICU beds), in urban Detroit. CAUTI rates were calculated per 1000 catheter days. In January 2015, CAUTIs from 2013-14 were reviewed and 2015 criteria were applied to estimate the impact on CAUTI rates. In January 2016, the actual CAUTI rate for 2015 was confirmed. All CAUTIs from 2013-15 defined using 2015 criteria were reviewed to identify any concurrent (x1 day) microbiologically confirmed infections using NHSN definitions.

Results: Application of 2015 criteria resulted in an approximate 50% reduction of 2013-14 CAUTI rates and exclusion of 166 (52.2%) CAUTI events (Table 1). The actual CAUTI rate in 2015 was 2.87%, consistent with our estimate. Despite use of more specific 2015 criteria, 22 (9.3%) pts with CAUTI had concurrent infections confirmed by blood/stool/sterile site cultures: 5-Laboratory confirmed bloodstream infection (BSI), 5-Central line associated BSI, 4-surgical site infection-meningitis, 3-intraabdominal infection, 3-Pneumonia with bacteremia/pneumonia.

Conclusion: Application of the 2015 NHSN definition reduced CAUTI rates by about half. The impact of the definition change should be recognized and success of CAUTI improvement measures should be reflected in a reduction of CAUTI rates by >50%. About 1 in 10 ICU pts with NHSN defined CAUTI have concurrent alternate infection. Modification of criteria may be needed in this population to improve specificity of the definition.

Methods

In January 2015, CAUTIs from 2013-14 were reviewed and the new 2015 criteria were retrospectively applied to estimate the impact of the new definition on CAUTI rates. These estimates were validated by comparing them to the actual CAUTI rate for 2015.

Table 1. Actual and Estimated CAUTI events and CAUTI rates based on 2013 and 2015 NHSN Criteria

<table>
<thead>
<tr>
<th>Year</th>
<th>CAUTI events</th>
<th>Criteria used</th>
<th>CAUTI rates %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>173</td>
<td>2013</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>76</td>
<td>2015</td>
<td>76</td>
</tr>
</tbody>
</table>

Of the 237 cases defined using 2015 NHSN criteria 2013-2015:
- 22 (9.3%) patients had concurrent NHSN-defined infections confirmed by positive cultures from sterile sites.

Table 2. Infections confirmed by positive cultures from sterile sites (N=22)

<table>
<thead>
<tr>
<th>BSI</th>
<th>CLABSI</th>
<th>Intrabdominal Infections</th>
<th>Primary (not CLABSI and not related to infection at another site)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Results

- The application of the new 2015 NHSN CAUTI definition markedly reduced the rates of CAUTI by slightly over half.
- The reduction was primarily due to exclusion of candiduria..
- Despite the use of the more specific 2015 criteria, approximately 9% of our ICU patients with CAUTI and fever as the sole symptom, had a concurrent NHSN-defined microbiologically confirmed infection.
- This significant reduction in CAUTI rates, resulting from change in definition, must be considered when evaluating effectiveness of CAUTI prevention programs.

Conclusion

- The goal of this study were:
  - Estimate the impact of the 2015 CAUTI criteria on 2013 and 2014 CAUTI rates in ICU patients.
  - Evaluate the proportion of CAUTIs in ICU patients with fever as the sole symptom and another concurrent microbiologically-confirmed infection.
- Methods
  - Retrospective analysis of CAUTI surveillance data of ICU patients was performed at Henry Ford Hospital, an 800 bed teaching hospital with 140 intensive care unit beds, in urban Detroit.
  - CAUTI rates were calculated per 1000 urinary catheter days.

Objectives

- Urinary tract infections (UTI) account for 12.9% of HAIs in acute care hospitals. Almost all healthcare-associated UTI occur in patients with an indwelling urinary catheter or instrumentation of the urinary tract.
- In 2015, two important modifications were made to the 2013 NHSN surveillance definition of CAUTI, with the aim of producing a meaningful comparative and objective metric that could guide CAUTI prevention practices. The new definition of symptomatic CAUTI removes the presence of yeast and nonbacterial organisms from the list of eligible uropathogens, and limits the threshold of the organisms to ≥10^4 CFU/mL.
- However, the requirement to report a CAUTI with fever as the sole symptom even if another source of fever is identified remains unchanged. The impact of the change in definition on rates of CAUTI remains to be determined.

Background

- In 2015, the National Healthcare Safety Network (NHSN) definition of catheter-associated urinary tract infection (CAUTI) was modified to improve specificity and produce a measure that accurately identifies patients (pts) with CAUTI. However, presence of a concurrent alternate infection is not an exclusionary criteria for CAUTI. The goals of this study were to (a) estimate the impact of 2015 NHSN criteria on CAUTI rates in 2013-14 for intensive care units (ICU) and (b) determine if these estimated rates were consistent with the actual CAUTI rate in 2015 (c) determine the accuracy of 2015 criteria in classifying pts with CAUTI.

Methods

- In January 2015, CAUTIs from 2013-14 were reviewed and the new 2015 criteria were retrospectively applied to estimate the impact of the new definition on CAUTI rates. These estimates were validated by comparing them to the actual CAUTI rate for 2015.
- The medical records of all 237 patients with CAUTIs from 2013-15 defined using 2015 criteria were reviewed to identify any concurrent (x1 day) NHSN-defined and microbiologically-confirmed (positive culture of a sterile site specimen) infection.

Table 1. Actual and Estimated CAUTI events and CAUTI rates based on 2013 and 2015 NHSN Criteria

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<tbody>
<tr>
<td>CAUTI events</td>
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<td>145</td>
<td>NA</td>
</tr>
<tr>
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<td>76</td>
<td>76</td>
</tr>
<tr>
<td>Criteria used</td>
<td>2015</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

- In January 2015, the actual CAUTI rate for 2015 was confirmed. All CAUTIs from 2013-15 defined using 2015 criteria were reviewed to identify any concurrent (x1 day) microbiologically confirmed infections using NHSN definitions.

Conclusion

- The application of the new 2015 NHSN CAUTI definition markedly reduced the rates of CAUTI by slightly over half.
- Despite the use of the more specific 2015 criteria, approximately 9% of our ICU patients with CAUTI and fever as the sole symptom, had a concurrent NHSN-defined microbiologically confirmed infection.
- This significant reduction in CAUTI rates, resulting from change in definition, must be considered when evaluating effectiveness of CAUTI prevention programs.