Surveillance of central venous catheter bloodstream infections in critical care units in England: results from the sentinel study May 2016–April 2017

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**INTRODUCTION**

Bloodstream infections (BSI) from central venous catheters (CVC-BSI) in critically ill patients in intensive/critical care units (ICUs) increases morbidity and mortality, and have high economic impact and are potentially preventable.1,2

Substantial reductions in CVC-BSI rates have been previously reported in England in a ten year study (2005-15). A key outcome was the need for a professionally-owned, standardised, national infection surveillance programme in ICUs.1,3

In 2011, the Infection in Critical Care Quality Improvement Programme (ICCOPI) was developed, representing a national collaboration of all professional organisations involved in adult, paediatric and neonatal intensive care, microbiology and infection control.4 Here we present the results from the first year of the ICCQIP (CVC-BSI) surveillance programme.

**METHODS**

**Surveillance participation**

- A web based data capture system (CICS) was launched in May 2016 to collect patient level data (patient and specimen details, clinical signs and symptoms at the time of the first positive blood culture (PBC), whether antibiotic were administered to treat the PBC, CVC-related data) on all PCVs in participating ICUs and unit-level data on bed-days and CVC-days.5
- Case definitions were based on the Centers for Disease Control and Prevention (CDC) and European Centre for Disease Prevention and Control (ECDC) protocols.6
- Episode length was 7 days, and PCVs with the same organism(s) within this period were excluded.
- Participation: NHS Trusts (hospitals under the same management) in England who had pre-registered their interest (n=43) were invited to participate in the voluntary sentinel phase of the CVC-BSI surveillance programme.
- In November 2016, the invitation was extended to all NHS Trusts in England, and participation encouraged by the Chief Medical Officer.

**Analysis**

- All descriptive analyses were carried out using Stata®.7
- Only data from units that provided infection (including nil returns) and denominator data are presented here.

**RESULTS**

Counts and rates of PCVs and ICU-associated BSIs in ICUs

<table>
<thead>
<tr>
<th></th>
<th>Adult PCUs</th>
<th>Paediatric PCUs</th>
<th>Neonatal PCUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of BSI</td>
<td>469</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of patient days</td>
<td>80,411</td>
<td>9,858</td>
<td>14,095</td>
</tr>
<tr>
<td>Rate of ICU-associated BSI per 1,000 ICU-CVC days</td>
<td>4.9</td>
<td>500</td>
<td>33.0</td>
</tr>
<tr>
<td>Number of ICU-associated BSIs</td>
<td>14</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Number of days of ICU-associated BSI per 1,000 ICU-CVC days</td>
<td>23</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Rate of ICU-BSI per 1,000 patient-days</td>
<td>0.7</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Rate of ICU-BSI per 1,000 patient bed-days</td>
<td>0.7</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Rate of ICU-BSI per 1,000 CVC-days</td>
<td>0.7</td>
<td>0.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Sixty-six percent of NHS Trusts have signed up to the surveillance programme since its national launch. However, not all sign-up Trusts have had the resources to actively participate.

CoVs were the most commonly found organisms in all PCVs across the three ICU types. This contrasts with the national rate with CoV being reported most commonly, in 25% of cases.

The overall rates of ICU-associated CVC-BSI were higher in adult ICUs then the rates at the end of the Michigan study (2.3 vs 1.5 IU/CVC-days), but lower in paediatric ICUs (1.2 vs 3.91,000 ICU-CVC-days) although methodological differences may affect the comparability.

With the surveillance scheme now out of its sentinel phase, work on facilitators and identification of barriers to participation will be assessed in order to increase the number of Trusts in England providing data.

Collaboration with other quality improvement programmes such as IGNAR, PICANET and BnadNet is underway, and wider engagement will be encouraged by Care Quality Commission, and professional networks.

**ACKNOWLEDGEMENTS**

We are very grateful to the staff in participating units for providing data to the surveillance scheme now out of its sentinel phase. Furthermore, we thank ICCQIP colleagues and members for their continuous support. For their continuous support.

**REFERENCES**


5. Srinivasan A, Wall P, and Sothern E. Explaining the different rates between units noted from the surveillance scheme now out of its sentinel phase, work on facilitators and identification of barriers to participation will be assessed in order to increase the number of Trusts in England providing data.

6. Collaboration with other quality improvement programmes such as IGNAR, PICANET and BnadNet is underway, and wider engagement will be encouraged by Care Quality Commission, and professional networks.