1. Introduction

- Extended-spectrum beta-lactamase Enterobacteriaceae (ESBL-E) and other resistant Enterobacteriaceae such as carbapenem-resistant Enterobacteriaceae (CRE) colonise the gut, so screening requires a sample from the rectal/perineal region or stool specimen.
- Perineal swabs are less invasive than rectal swabs, so preferable in terms of staff and patient acceptability.
- Therefore, we compared the sensitivity of rectal and perineal swabs for detecting ESBL-E.

2. Methods

- 4392 patients were approached within the first 72 hours of their admission and provided a rectal and perineal swab.
- Swabs were cultured on chromogenic media for ESBL-E.
- Each patient was asked a series of questions relating to risk factors.
- ESBL-E detection rates and risk factors were analysed using Fisher’s exact tests.
- The study was approved by the NHS Research Ethics Committee.

Fig 1: Rate of ESBL carriage from rectal vs. perineal swabs

3. Results

- ESBL-E was cultured from 354 (8.1% of patients overall); 81% were E. coli, 8% were K. pneumoniae.
- Rectal swabs were significantly more sensitive for detecting ESBL-E than perineal swabs: 331 (7.5%) vs. 165 (3.8%), p<0.001 (Fisher’s exact test) (Fig 1).
- Risk factors for ESBL-E were common in the group screened, with 3439 (78%) of patients having one or more risk factors.
- Risk factors significantly associated with ESBL-E carriage included: overnight hospital stay in the past 12 months at GSTT, within the M25, or overseas; and more than one course of antibiotics in the past 6 months (Table 1).
- Almost a quarter (24%) of patients with overseas hospitalisation in the past 12 months carried ESBL-E.

4. Discussion

- Although perineal swabs would be preferable to rectal swabs in terms of patient acceptability, our data suggest that they are significantly less sensitive for detecting ESBL-E – detecting only around half of carriers.
- This has clear implications for the detection of other resistant Enterobacteriaceae, most notably CRE.
- We did not evaluate the performance of an anal or perianal swab (without sampling the rectum), which could be the subject of further studies.
- We recommend rectal swabs for detecting carriage of resistant Enterobacteriaceae.
- Risk factors for ESBL-E carriage related to overnight hospitalisation both in the UK but especially abroad.
- Admission screening for ESBL-E may be useful to prevent cross-transmission, but would place a considerable burden on limited isolation facilities.

Table 1: Risk factors for ESBL

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>N pts with risk factor</th>
<th>% ESBL (risk factor)</th>
<th>% ESBL (without risk factor)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-UK residents</td>
<td>47</td>
<td>10.6%</td>
<td>8.4%</td>
<td>0.6171</td>
</tr>
<tr>
<td>Overseas travel in the past 12 months</td>
<td>1358</td>
<td>9.1%</td>
<td>8.1%</td>
<td>0.3489</td>
</tr>
<tr>
<td>Overnight hospital stay in the past 12 months - GSTT</td>
<td>1459</td>
<td>9.9%</td>
<td>7.7%</td>
<td>0.0242</td>
</tr>
<tr>
<td>Overnight hospital stay in the past 12 months - within M25</td>
<td>1703</td>
<td>10.0%</td>
<td>7.4%</td>
<td>0.0059</td>
</tr>
<tr>
<td>Overnight hospital stay in the past 12 months - any UK</td>
<td>1895</td>
<td>9.3%</td>
<td>7.7%</td>
<td>0.0936</td>
</tr>
<tr>
<td>Overnight hospital stay in the past 12 months – overseas</td>
<td>42</td>
<td>23.8%</td>
<td>8.3%</td>
<td>0.0019</td>
</tr>
<tr>
<td>Antibiotics in the past 6 months - one course</td>
<td>1269</td>
<td>7.6%</td>
<td>8.8%</td>
<td>0.2697</td>
</tr>
<tr>
<td>Antibiotics in the past 6 months - &gt;1 course</td>
<td>1103</td>
<td>11.8%</td>
<td>7.2%</td>
<td>0.00002</td>
</tr>
</tbody>
</table>

E. coli, K. pneumoniae, Enterobacteriaceae.