GROWING PROPORTION OF BLOODSTREAM INFECTION DUE TO E. FAECIUM VS. E. FAECALIS IN THE UK: A LONG TEMPORAL SHIFT

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INTRODUCTION

- Enterococci are among the top 10 pathogens causing bloodstream infection in England (BSI)1
- Enterococcus faecalis was the prevalent species, but E. faecium the more resistant.2
- Mortality is higher in patients infected with E. faecium compared with E. faecalis.2
- The BSAC Resistance Surveillance Programme monitors antimicrobial resistance of bacteria causing BSI within the UK & Ireland.4
- Public Health England (PHE) captures most routine NHS laboratory data from its SGSS (Second Generation Surveillance System).3

Objective:
- To review temporal changes in the proportion of E. faecium vs. E. faecalis from the two surveillance schemes.

METHODS

BSAC Bacteraemia Surveillance Data
- Between 2001 and 2016, 7-10 consecutive bloodstream enterococci were sent p.a. from laboratories (n=24-38) across the UK & Ireland. (Fig. 1).
- Isolates were re-identified centrally by PCR (2001-2004) or MALDI-ToF (2005-2016).
- MICs were determined by agar dilution,6 current EUCAST breakpoints were used.7

PHE Bacteraemia Surveillance Data
- NHS microbiology laboratories in England, Wales and Northern Ireland electronically report results of local susceptibility testing to PHE.
- Data from 2000-2016 were analysed.
- Not all reports indicated species identification, so isolates were also categorised according to ampicillin/amoxicillin susceptibility.

RESULTS

<table>
<thead>
<tr>
<th>BSAC Surveillance</th>
<th>PHE Surveillance</th>
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<tr>
<td>Between 2001-2016 E. faecium/E. faecalis isolates were received annually, 2001-2016 (n=3578).</td>
<td>Provided a larger dataset (2840 reports of enterococcal BSI in 2000 and 5000-7000 p.a. from 2003-2016).</td>
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<tr>
<td>The proportion of E. faecium rose:</td>
<td>The proportion of E. faecium increased over time, based either on reported identification or amoxicillin resistance (Fig 3).</td>
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<td>• 311-36.5% in 2001-4</td>
<td>Unlike in the BSAC surveillance, the proportion of E. faecalis still narrowly outnumbered E. faecium in 2016 (Fig. 3).</td>
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<td>• 47.3-54.7% in 2012-16 (Fig. 2)</td>
<td>Antibiotic Susceptibilities</td>
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<td>The proportion of E. faecalis fell:</td>
<td>Rates of non-susceptibility to ampicillin, vancomycin and high-level gentamicin are shown in Figures 4 &amp; 5 (BSAC data).</td>
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<td>• 68.9-63.5% in 2001-4</td>
<td>A gradual decline in high-level gentamicin resistance was identified in E. faecalis (Fig. 5).</td>
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<td>• 52.7-45.3% in 2012-15 (Fig. 2)</td>
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<td>In 2016, E. faecium (54.7%) exceeded E. faecalis (45.3%) (Fig. 5).</td>
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CONCLUSIONS

- Both BSAC and PHE surveillance data indicated an increase in proportion of E. faecium among enterococcal BSI.
- The increased proportion of E. faecium is reflected in increased antibiotic resistance (to ampicillin and vancomycin).
- There are fewer therapeutic options available for multi-resistant E. faecium, which may result in higher mortality.
- The reason behind the decrease in high-level gentamicin resistance in E. faecalis is unknown and will be subject to further investigation.

ACKNOWLEDGEMENTS

Currently, the BSAC Resistance Surveillance Programme was funded by Basilea, Bayer, MSD, Nabriva, and Pfizer. The authors thank the staff in the sentinel laboratories submitting isolates, and at the Central Testing Laboratory, PHE, London. BSAC Standing Committee on Resistance Surveillance, and Sponsor Representatives: Alasdair MacGowan (Chair), Derek Brown (formerly EUCAST), David Livermore (PHE), Shazad Mushtaq (PHE), Alan Johnson (PHE), Anne Santerre-Henriksen (formerly Basilea), Chris Longshaw (formerly Basilea), Jeff Alder (Bayer), Adela Alvarez Buylla (MSD), Mike Allen (MSD), James Campling (Pfizer), Jan Chesham (Pfizer), and Susanne Paukner (Nabriva).

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