Antimicrobial susceptibility among invasive Gram-negative bacteria in the UK and Ireland: The BSAC Bacteraemia Resistance Surveillance Programme 2003

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Introduction and Methods

- 25 laboratories in the UK and Ireland contributed non-duplicate bacterial isolates from blood to the BSAC Bacteraemia Resistance Surveillance Programme[1] in 2003.
- MICs were determined centrally by the BSAC agar dilution method and interpreted by BSAC criteria.
- Isolates with MICs on or above the susceptibility breakpoint for ceftazidime or cefotaxime were tested for ESBLs by clavulanate synergy tests (potentiation of ≥ 8-fold) for ceftazidime, cefotaxime and cefepime.

[1]Reynolds, R., Potz, N., Colman, M. *et al.* (2004). Antimicrobial Susceptibility of the Pathogens of Bacteraemia in the UK and Ireland 2001 - 2002: the BSAC Bacteraemia Resistance Surveillance Programme. *JAC* 53, 1018-1032.

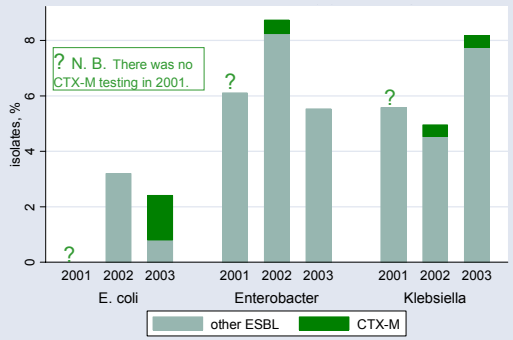
Results

- 59% of *E. coli* were resistant to amoxicillin, almost all with MIC > 512 mg/L; MICs for the rest were mostly 4-8 mg/L.
- 33% of *Enterobacter* spp. isolates were inferred to be AmpC hyperproducers, being CAZ/CTX-resistant without ESBLs.
- The one imipenem-resistant *Enterobacter* (MIC >16 mg/L) produced a novel KPC enzyme, KPC-4. (See poster P427.)
- Multi-resistant isolates with CTX-M ESBLs were found among *Klebsiella*, *Enterobacter*, *Citrobacter* and, notably, *E. coli*; all were susceptible to imipenem and ertapenem, and inhibited by tigecycline at ≤2 mg/L.
- No statistically significant trends in resistance were detected over three years of similar surveillance (2001 – 2003).

Conclusion

- ESBLs are now established in the UK, albeit at low frequency, with CTX-M types increasingly observed.
- Imipenem, ertapenem and tigecycline retained good activity against ESBL-producers.

CTX-M and other ESBLs by year and genus



Proteus mirabilis

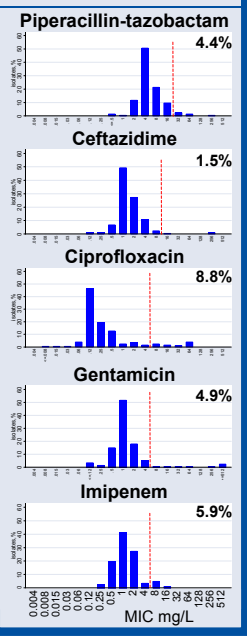
(n = 186)	resistant
amoxicillin	29%
amox-clav	1.1%
ciprofloxacin	8.1%
gentamicin	5.4%

None resistant to ceftazidime, cefotaxime, piperacillin-tazobactam, ertapenem, or imipenem.

No ESBL-producers.

Inherent resistance to tetracycline, minocycline and tigecycline (MIC_{90} ≥ 64, 64, 16 mg/L respectively).

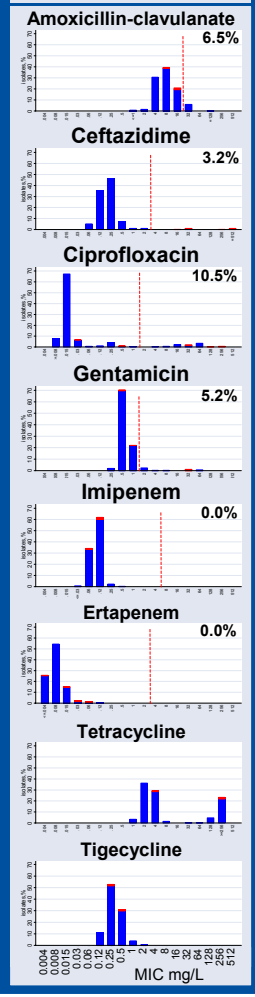
P. aeruginosa n = 205



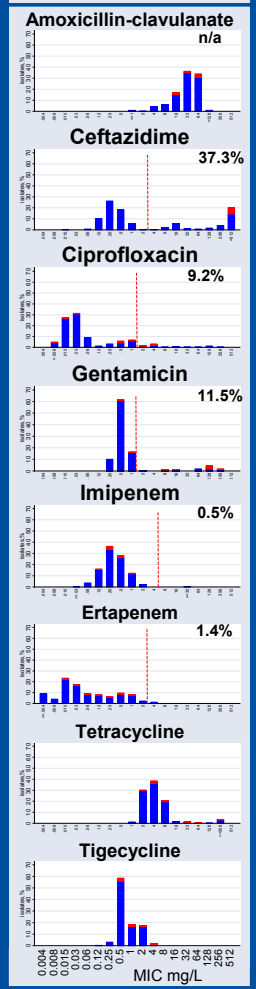
MIC distributions

non ESBL-producers | ESBL-producers | breakpoint, % resistant

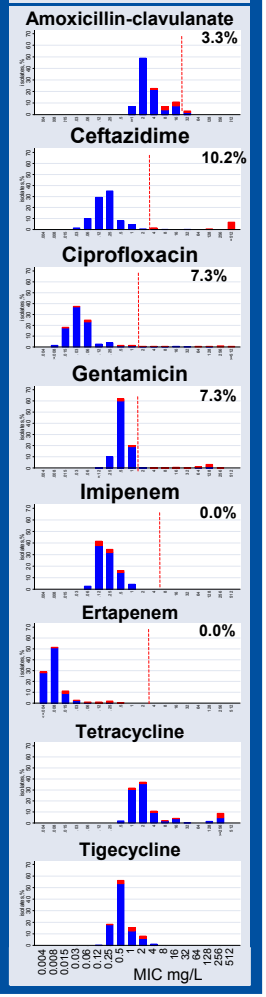
Escherichia coli n = 248



Enterobacter spp n = 217



Klebsiella spp. n = 245



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Organism ID and Susceptibility Testing: M. Colman[6], R. Hope[6], N. Potz[6].
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Central Laboratory: HPA, Centre for Infections, London.

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