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Paper Poster Session VI

Methods of antibacterial susceptibility testing

Results from the 2014 antimicrobial susceptibility testing external quality assessment (EQA) exercise organised for EARS-net participants

S. Seaton[1], C. Lawson[1], L. Quartermain[1], A. Thomas[1], E.J. Fagan[1], A. Couchman[1], D.F.G. Brown[1], C. Walton[1]

[1]*UK NEQAS Public Health England, London, United Kingdom*

Objectives: The United Kingdom National External Quality Assessment Service for Microbiology (NEQAS) has provided annual external quality assessment (EQA) for antimicrobial susceptibility testing to the EARS-net (formerly EARSS) since 2000. The aim is to assess and monitor the comparability of results between laboratories and countries and thus justify the pooling and comparison of routinely collected antimicrobial susceptibility test data across Europe

Methods: An analysis was carried out on the performance of participants in the quality assessment exercise. Participation was invited from 905 laboratories in 30 countries and results were returned by 838 laboratories. The organisms distributed were; an *Escherichia coli, Klebsiella pneumoniae, Staphylococcus aureus*, *Streptococcus pneumoniae*, *Enterococcus faecium and Acinetobacter baumannii* complex Participants' results for identification and antimicrobial susceptibility testing were collated and assessed.

Results: The level of performance with these quality assessment specimens was high with an overall concordance with the intended results of 94% (range 29% to 100%). Specimen 2486 contained an *E. coli* which produces a CTX-M-15 ESBL. Reference MICs for piperacillin-tazobactam were 32-64 mg/L; results were variable (42.7% S, 28.3% I, 29.0% R). A higher discrepancy rate was also seen with amikacin in this isolate. Specimen 2487 contained a *Klebsiella pneumoniae* which produces a VIM carbapenemase and was resistant to all reference agents tested except gentamicin. The reference MIC for amikacin was borderline: 16 mg/L, intermediate by EUCAST and susceptible by CLSI. Reporting for amikacin was variable (13.2% S, 60.4% I, 26.4% R). Specimen 2488 contained a *Staphylococcus aureus* with low level resistance to vancomycin and teicoplanin (VISA).

Of 815 participants reporting vancomycin susceptibility only 42.1% reported resistant and 9.7% intermediate, whilst 48.2% incorrectly reported susceptible. Reduced susceptibility to teicoplanin was more readily detected and of 714 participants reporting teicoplanin susceptibility, 75.1% reported resistant, 9.5% intermediate and 15.4% susceptible. Isolates of *S. aureus* with vancomycin MICs of 4-8 mg/L were originally termed "vancomycin intermediate *S. aureus*" (VISA) because the level of resistance is low and is distinguishable from the high-level resistance displayed by *S. aureus* carrying the *mecA* gene (MICs >8 mg/L). While CLSI have maintained this distinction EUCAST does not have an intermediate category because VISA strains are clinically resistant. Specimen 2489 contained a *Streptococcus pneumoniae* with reduced susceptibility to penicillin. Specimen 2490 contained an *E. faecium* that was positive for high level gentamicin resistance and specimen 2491 contained *Acinetobacter baumannii* complex resistant to all agents tested except for colistin.

Conclusion: EQA is a valuable tool in the quality assurance of antimicrobial susceptibility testing in the diagnostic laboratory and indicates the validity of comparing collated data between laboratories. In this exercise overall concordance between participating laboratories was high except where there was borderline susceptibility or different guidelines used, revealing remaining discrepancies in susceptibility testing.