

S178

2-hour Symposium

Bloodstream infections in the era of MDR and XDR Gram-negative bacteria

Reporting blood culture results to clinicians: MIC, resistance mechanisms, both?

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In the early 2000s therapeutic failures with extended-spectrum cephalosporins were observed in infections caused by Enterobacteriaceae producing extended-spectrum beta-lactamases (ESBL). Following results from some pivotal studies, it became common practice to conduct ESBL-testing prior to reporting of susceptibility results to penicillins and cephalosporins. In the early 2010s the two international breakpoint committees EUCAST and CLSI recommended to discontinue this practice, since it was considered unnecessary following the lowering of clinical breakpoints. Hence, the paradigm shifted from focusing on resistance mechanisms to a focus on minimal inhibitory concentrations (MIC), although the topic continued to evoke heavy debate in the scientific community.

The emergence of carbapenemase-producing Enterobacteriaceae (CPE) led to revisited discussions on MIC vs resistance mechanisms, as problems of reproducibility in MIC-testing were observed with isolates of CPE. This problem had not been pronounced with ESBL-producing Enterobacteriaceae. Clinical data guiding treatment of CPE are limited, but mostly supporting the use of carbapenems if the MICs are low. Further, an increasing amount of data suggest that combination therapy should be used for treatment of CPE, although the studies are prone to significant biases. Contrarily, there is no data at present to suggest that combination therapy is needed for treatment of non-CPE isolates with carbapenem-resistance.

In this presentation the importance of reporting resistance mechanisms will be discussed, by reviewing clinical data as well as in vivo and in vitro pharmacokinetic and pharmacodynamic data. Reproducibility issues in MIC-testing will be discussed based on recent European external quality assessment data, and novel approaches of antimicrobial susceptibility testing based on whole-genome sequencing will be described. Finally, various implications of strategies based on reporting of MIC vs resistance mechanism will be discussed.