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P2818 Validation of FASTinov gramneg kit for rapid assessment of antimicrobial susceptibility directly from positive blood cell cultures

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Background: Clinical outcome of bloodstream infections significantly improves with the early administration of appropriate antimicrobial therapy. However, current methods for antimicrobial susceptibility testing (AST) are often unable to provide a response in useful time. The aim of this study was to validate the FASTinov® gramneg kit, a flow cytometry-based assay for the rapid assessment of antimicrobial susceptibility of gram negative bacilli, directly from positive blood cultures.

Materials/methods: Blood culture bottles (BD) were spiked with 107 Enterobacteriaceae, inoculated with human donor blood and incubated until obtaining a positive flag. E. coli NCTC 13846, ATCC 25922, ATCC 35218, ATCC 8739, ATCC BAA-2452, K. pneumoniae ATCC 700603, NCTC 13443, ATCC BAA-1705, ATCC BAA-1706, S. marcescens ATCC 14756, P. rettgeri BAA-2525, E. aerogenes ATCC 13048 and E. cloacae CCUG 59627 were included in this study as quality control strains. Bacteria were extracted according with user´s instruction and inoculated on FASTinov® gramneg kit. FASTinov® gramneg kit (containing the main antimicrobial drugs and fluorescent dyes) were incubated at 37ºC during 1h. Afterwards, microplates were analyzed on a CytoFLEX flow cytometer (Beckman Coulter). Results were automatically provided by BioFAST software according to EUCAST or CLSI protocols, and compared with reference method.

Results: The overall agreement between FASTinov® gramneg kit and reference method was 92.8% for EUCAST and 91.0% for CLSI. According EUCAST, all antimicrobial drugs, except ceftolozane-tazobactam, meropenem and imipenem, showed a CA>90%. The highest major error (ME) discrepancies were detected with ampicillin, followed by amoxicillin-clavulanic acid and ciprofloxacin; the highest very major error (VME) rate was detected with ceftolozane-tazobactam. Regarding CLSI, only amoxacillin-clavulanic acid, ceftolozane-tazobactam and imipenem showed a CA≤90%. The highest ME rate was observed for ceftazidime, followed by imipenem, while the highest VME rate was detected with meropenem.

Conclusions: Our results demonstrate the accuracy of FASTinov® gramneg kit for assessment of antimicrobial susceptibility directly from positive blood cultures in a TTR of 2h (versus 48h required for current methodologies). This novel assay may allow target administration of antimicrobial therapy in clinical useful time.