27th ECCMID Vienna, Austria 22 – 25 April 2017

The congress of ESCMID

Session: EP133 Laboratory detection of multidrug-resistant organisms

Category: 4a. Diagnostic bacteriology – culture based

24 April 2017, 14:18 - 14:23
EP0677

Rapid detection of multiple amino glycoside resistance in Enterobacteriaceae

Patrice Nordmann*[1], Aurélie Jayol[2], Jan Dobias[3], Laurent Poirel[4]

[1]*University of Fribourg; Deparment of Medicine, Faculty of Science, Medical and Molecular Microbiology Unit*

[2]*University of Fribourg; Laboratory of Microbiology; Department of Medecine*

[3]*University of Fribourg*

[4]*University of Fribourg; Dept of Medicine*

Background: Extended-spectrum ß-lactamases that hydrolyze extended-spectrum cephalosporins, and carbapenemases that hydrolyze in addition carbapenems are disseminating worldwide in *Enterobacteriaceae*, and therapeutic options are becoming limited. For those multidrug resistant isolates, aminoglycosides (AG) may still be considered as valuable treatment options. However, plasmid-mediated 16S rRNA methylases conferring a high level of resistance to multiple AG is increasingly reported. The 16S rRNA methylases described in *Enterobacteriaceae* are ArmA, RmtB to RmtF, and NpmA, with ArmA being the most frequently identified. The Rapid Aminoglycoside NP test was developed to identify rapidly multiple aminoglycoside (AG) resistance in *Enterobacteriaceae*.

Material/methods: It is based on the detection of the glucose metabolism related to enterobacterial growth in presence of a defined concentration of amikacin plus gentamicin.

Formation of acid metabolites was evidenced by a color change (orange to yellow) of the red phenol pH indicator. The Rapid Aminoglycoside NP test was evaluated by using bacterial colonies of 18 AG resistant isolates expressing various 16S rRNA methylases, 20 AG resistant isolates expressing AG-modifying enzymes (acetyl, adenyl and phospho transferases), and 10 isolates susceptible to AG.

Results: The sensitivity and specificity of the Rapid Aminoglycoside NP test were both 100%, as compared to the broth dilution method taken as the gold standard for determining MICs. All isolates producing either ArmA, RmtB, RmtC, RmtF, RmtG or NpmA were perfectly identified. On the opposite, isolates producing aminoglycoside-modifying enzymes (AAC[6'], AAC[3], APH, ANT) gave negative results.

Conclusions: The Rapid Aminoglycoside NP test is easy-to-perform, rapid (< 2 h), sensitive, and specific. It detects multiple AG resistance from bacterial cultures from infected samples or from selective media prior to obtaining any antibiotic susceptibility testing results.