

O156

**Oral Session**

**Detection of broad spectrum beta-lactamases**

**BLOODSTREAM INFECTIONS CAUSED BY PSEUDOMONAS SPP.; HOW TO DETECT CARBAPENEMASE PRODUCERS RAPIDLY ?**

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**Objectives** Determine the ability of the Carba NP test to detect carbapenemase-producing *Pseudomonas* species directly from blood cultures.

**Methods** A panel of forty-two carbapenemase-producing *Pseudomonas* species was included in the study and seventy-two non-carbapenemase producers *Pseudomonas* were used as controls. The Carba NP test was performed on spiked blood cultures from which the positivity was assessed using the BactAlert blood culture system (bioMérieux). Blood cultures (10 ml of sterile human blood) were inoculated with  $1 \times 10^3$  CFU of each strain. The previously published Carba NP test was adapted for blood cultures as follows: 2 ml brain-heart infusion (BHI) supplemented with 70 mg/ml ZnSO<sub>4</sub> (final concentration) without imipenem were inoculated by five drops of a positive blood culture in two Eppendorf tubes. Inoculated BHI were then incubated under agitation at 37°C for 3 h. Bacteria were recovered by centrifugation at 10,000 x g for 5 min. This optimized protocol of the Carba NP test was directly performed on this bacterial pellet.

**Results** This optimized protocol of the Carba NP test, performed directly on spiked blood cultures, perfectly differentiated carbapenemase producers from strains being carbapenem-resistant due to non-carbapenemase-mediated mechanisms such as combined mechanisms of resistance (outer-membrane permeability defect +/- associated with overproduction of cephalosporinase and/or ESBLs). The sensitivity and specificity of the test were found to be 100% under those conditions. Noteworthy, GES-type producers were well detected from blood cultures whereas they were not from isolated colonies. Furthermore, the test was positive for two IMP-producing isolates remaining susceptible to carbapenems (MIC  $\leq 2$   $\mu$ g/ml) according to the CLSI guidelines.

**Conclusion** The Carba NP test combines multiple advantages: costless, rapid, reproducible, highly sensitive and specific. Use of this test would be helpful for choosing a first-line therapy based on an aminoglycoside associated with a fluoroquinolone rather than  $\beta$ -lactam-containing combinations, in particular when treating pneumonia. It can also be useful for detecting carbapenemase-producers in an attempt to control outbreaks and to rapidly differentiate between carbapenemase producers (transferable resistance determinant) and non-carbapenemase producers (non-transferable resistance determinant).