Evaluation of the molecular assay Genspeed® Superbug CR as screening test in a tertiary hospital with high prevalence of multidrug resistant Gram-negative bacteria

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Background

The dissemination of multi-drug resistant Gram-negative bacteria (MDRB) remains serious cause of nosocomial infections and major problem worldwide. Rapid detection of these microorganisms plays crucial role to the prevention of infections caused by them. Aim of this study is to evaluate a molecular assay for the detection of MDRB directly in fecal specimens.

Material/methods

Between November and December 2015, a total of 245 fecal specimens (68 real stools and 177 rectal swabs) were collected from patients without previous MDRB infections and hospitalized in various wards of the University Hospital of Larissa, Central Greece. The specimens concurrently

a. were cultured on MacConkey agar supplemented with 1 mg/ml imipenem,
b. were tested by the molecular assay Genspeed® Superbug CR (Greiner Bio-One, Kremsmunster, Austria) that can detect directly from the clinical specimen the genes bla_{VIM}, bla_{KPC}, bla_{NDM} and bla_{OXA-48}.

All isolates recovered from cultures were identified by the automated system VITEK 2 (bioMérieux, Marcy l'Etoile, France), while susceptibility test was done by VITEK 2 and gradient diffusion testing (Etest; bioMérieux). The detection of the genes encoding carbapenemases was assessed by PCR.

All equipment and supplies were provided by **Greiner Bio-One, Kremsmünster, Austria**

	Genspeed® Superbug CR (Greiner Bio-One, Kremsmünster, Austria)	Culture on selective media
sensitivity	95%	100%
MDRB detection	< 2 h	48 h

Results

According to culture results, 94 out of 245 specimens (38.4%) were found to be positive for one or more MDRB (*Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Enterobacter cloacae*, *Acinetobacter baumannii, Klebsiella oxytoca, Citrobacter freundii).* The most prevalent gene was found to be bla_{KPC} (19.59%) followed by bla_{VIM} (17.14%), bla_{NDM} (13.06%) and bla_{OXA-48} (0.8%). The Genspeed® Superbug CR compared with culture method reveal sensitivity 95%, specificity 95%, positive predictive value (PPV) 93% and negative predictive value (NPV) 97%. The mean time of MDRB detection by the culture method was 48 h versus less than 2h needed for detection with Genspeed® Superbug CR.

Conclusions

The introduction of Genspeed® Superbug CR in clinical settings offers an easy and accurate detection of MDRB that permits the rapid isolation of the colonized patients.