

**P0948**

**Paper Poster Session**

**Recent studies of non-culture techniques for detection of resistance**

**Evaluation of GeneXpert® CARBA-R system on pooled surveillance rectal swabs**

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**Background:** Carbapenem-resistant *Enterobacteriaceae* (CRE) cause severe problems in healthcare facilities. The ability of these organisms to spread from patient to patient, their high mortality rate and the lack of effective treatment options led to the adoption of rapid screening for patients in order to limit the risk of transmission. The molecular method allow for an early identification but it is generally expensive compared with culture. The aim of our study was to evaluate pool of rectal swabs by a molecular method (GeneXpert® CARBA-R, Cepheid) for the rapid identification (50 minutes) of 5 *bla* genes: KPC, NDM, VIM, OXA-48 and IMP-1.

**Material/methods:** A total of 228 surveillance rectal swabs ( fecalSwab™, Copan) from patients hospitalized at Niguarda Hospital (Milan, Italy) were analyzed for the presence of CRE. Ten microliters of sample were inoculated onto a chromogenic medium (chromID® CARBA, BioMérieux) and incubated at 35° C for 18 hours. The isolates were identified (Maldi-TOF, Bruker), and tested for susceptibility (MicroScan WalkawayPlus, Beckman). Modified Hodge test, phenotypic test (with boronic and dipicolinic acid) and Etest® for ertapenem, imipenem and meropenem were performed for confirmation. Thirty-eight pools were created using these samples. Each pool included 6 samples. Several types of pool were created according to the culture results: 22 pools with all negative samples, 15 pools with 1 positive and 5 negative samples, 1 pool with 3 positive and 3 negative samples. The samples were vortexed and each pool was created according to the study protocol: 600 µL were removed from the Xpert Carba-R sample buffer and replaced with 100 µL of each rectal sample (600 µL total). All pools were tested by GeneXpert® CARBA-R and the results compared with traditional methods result.

**Results:** Twenty-one out of 22 culture negative pools also resulted negative by the molecular test (21/22, 95.4%), in one pool (1/22, 4.54%) KPC gene was detected by molecular method. In 2 cases culture yielded *Escherichia coli* and *Klebsiella pneumoniae*: these microorganisms resulted carbapenem intermediate but were negative by the modified Hodge and phenotypic methods confirming the molecular result. Whereas the 15 pools with at least one positive sample agreed with molecular method (15/15, 100%). The detected carbapenemase genes were: 15 KPC (13 *K. pneumoniae*, 2 *E. coli*) and 1 VIM (*K. pneumoniae*)

**Conclusions:** GeneXpert® CARBA-R is an easy system that provides a rapid and accurate response in just 50 minutes instead of 18-48 hours needed for traditional testing. Quick results obtained by

molecular biology allow for a better management of patients with the timely adoption of preventive measures to avoid the spread of the microorganism, such as isolation of just patients with positive result.