SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Unità Sanitaria Locale di Piacenza

AMCLI associazione microbiologi clinici italiani

P263

PERFORMANCE EVALUATION OF A NEW RT-PCR ASSAY FOR THE SCREENING OF CARBAPENEMASE-PRODUCING ENTEROBACTERALES (CPE) AND ACINETOBACTER SPP.

G. Tocci [1], V. Lepera [1], G. Palladini [1], A. Zappavigna [1], C. Cordini [1], C. Gorrini [1], L. La Vergata [1], R. Schiavo [1], G. Lo Cascio [1]
[1]Microbiology Unit, Department of Clinical Pathology, AUSL Piacenza, Italy

INTRODUCTION

The isolation of CPE is an increasing problem in healthcare facilities. Early identification of CPE is essential for appropriate antibiotic treatment, implementing contact precautions, detecting outbreaks and limiting their spread.

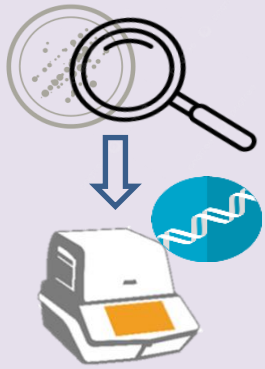
Using the culture method as a reference, the aim of the present work was to evaluate the performance of the REALQUALITY Carba-Screen (AB Analitica, Padua, Italy) test (RQC) for the detection by RT-PCR of CPE and OXA-producing Acinetobacter spp. (AcOXA) from surveillance swabs performed on residents of RSAs in the Piacenza area.

MATERIALS AND METHODS

256 surveillance swabs (nasal, inguinal and rectal) were examined for CPE and AcOXA. The swabs were seeded on selective media with meropenem and ertapenem discs and examined after 24 hours incubation at 37°C. For suspect colonies (according to the EUCAST method), antibiograms were prepared with Vitek 2 (Biomerieux).

Confirmation of carbapenemase production was performed with the phenotypic NG-test Carba 5 (NG Biotech, Guipry, France).

Subsequently, all swabs were analysed with REALQUALITY Carba-Screen for resistance genes. The method uses two steps: the first identifies carbapenemases A-B-D and the Acinetobacter spp. producer OXA, while the second specifically identifies the type of carbapenemase present in the sample (IMP, VIM, NDM, KPC, OXA-48).



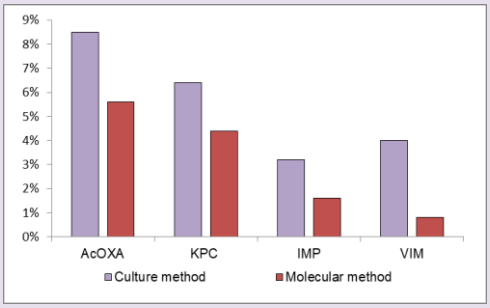


Chart 1. Positive results: culture method vs molecular method

RESULTS

Molecular tests revealed the presence of: AcOXA (8.5%), KPC (6.4%), IMP (3.2%), VIM (4%). In the same swabs, culture tests revealed the presence of AcOXA (5.6%), KPC (4.4%), IMP (1.6%), VIM (0.8%). In addition, the co-presence of MDR (multi drug resistance) microorganisms was detected in 12 swabs by RT-PCR and in 4 by culture method. The samples that gave an invalid result in the molecular test were 3.5%.

The total number of culture- and molecular test-positive swabs was 10.9% and 15.7%. 83.8% of the swabs were negative in the culture and molecular test. The concordance between the two tests was 99.5% and in particular 100% for the KPC phenotype, 96.7% for Acinetobacter spp., 95.1% for the VIM phenotype and 96.7% for the IMP phenotype, respectively.

The PPV for Acinetobacter spp. and carbapenemases of type KPC, VIM and IMP was 92.8%, 100%, 0%, 50%. Respectively, for the same MDR, the NPV was 96.9%, 97.9%, 95.9% and 97.5%.

CONCLUSIONS

In routine, having rapid tests available is essential to optimise patient management, to make correct treatment decisions, to enable infection control and to identify outbreaks quickly. Molecular techniques are faster but more expensive. The PCR test used is able to detect all resistance genes within a few hours of collection and can be performed directly on the swab without the need to set up the culture test. Furthermore, the test is the only one capable of detecting the simultaneous presence of A. baummanii MDR and CPE in the sample. However, these preliminary results, which show an excellent analytical performance, require further investigation for a future inclusion of the test in the laboratory routine. Indeed, further tests are needed to assess the actual robustness of the analytical data, especially in the identification of critical targets such as metallo-beta-lactamases.