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BATTERIOLOGIA

THE USE OF MICROSCAN WALKAWAY® 96 PLUS IN TESTING NEW ANTI-PSEUDOMONAL DRUGS IN A SAMPLE OF CYSTIC FIBROSIS PATIENTS

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INTRODUZIONE

Pseudomonas aeruginosa is an opportunistic pathogen often isolated from cystic fibrosis (CF) lung. It exhibits significant resistance to antibiotics, even by acquiring adaptive mutations during chronic infections.
Mucoid P. aeruginosa strains show a significant growth retardation associated with an increased frequency of mutations and adaptation to the conditions in the lungs and to antibiotic therapy. Due to this growth delay, the automated systems commonly used in the diagnostic routine for the identification and the antimicrobial susceptibility testing (AST), typically set to perform the analysis within 12 hours (h), are not able to give an output at the end of their process.
Our goal was to evaluate the performances of the MicroScan WalkAway® 96 Plus system NMDR1 panel able to overcome this limit thanks to its ability of extending the analysis over 20h. Particularly, this panel tests new anti-pseudomonal drugs, i.e. Ceftazidime/Avibactam (CAZ/AVB) and Ceftolozane/Tazobactam (CLZ/TAZ).

METODI

7 mucoid and 24 non-mucoid P. aeruginosa clinical strains were isolated from respiratory samples, during a 3-month period (May–July 2019) at the POU G. Rodolico (Catania), from CF patients with the exacerbation of recurrent infections. Bacterial identification was performed using the Phoenix (Becton Dickinson), whilst the AST was made by MicroScan WalkAway® 96 Plus system. CAZ/AVB and CLZ/TAZ MIC values have been validated by performing E-tests to the entire sample. The presence of MBL encoding genes was evaluated by Immunochromatographic assay and AmpC Screening kit.

RISULTATI

The MicroScan WalkAway® 96 Plus system gave the output within and after 20h of growing. Among the 7 mucoid slow growing strains, 6 were susceptible (S) to CAZ/AVB and CLZ/TAZ, while 1 was resistant (R) to both the molecules.
Among the 24 non-mucoid strains, 2 resulted CAZ/AVB-S and CLZ/TAZ-R, 2 resistant and 20 susceptible to both the molecules.
All the CAZ/AVB-CLZ/TAZ-R strains were not positive for MBL genes, whereas 2 CLZ/TAZ-R non-mucoid strains harbored a VIM1 encoding gene.

CONCLUSIONI

These results highlight the success of MicroScan WalkAway® 96 Plus system in analyzing both slow growing and phenotypically normal P. aeruginosa strains antimicrobial resistance profile with high confidences levels and reproducibility. Further studies will be conducted to better elucidate the molecular mechanisms behind the resistance to the aforementioned anti-pseudomonal drugs.