

September 16, 2020

WEBINAR

Corneliu Ovidiu Vrancianu, J Bacteriol Parasitol 2021, Volume 11

Tracking down multidrug-resistant *Acinetobacter baumannii* isolates from hospital to the aquatic environment via the wastewater network

Corneliu Ovidiu Vrancianu

University of Bucharest, Romania

Abstract: Hospital sewages and wastewater treatment plants (WWTPs) are hotspots for development and dissemination of antibiotic resistance. We have characterized multidrug-resistant *Acinetobacter baumannii* (MDR Ab) strains isolated in the same temporal sequence from hospital infections (HI) and from two WWTPs collecting wastewaters (Is and Gl) from Northern Romania.

Experimental Procedure: The strains isolated on carbapenem and third generation cephalosporin supplemented culture media were identified and characterized for their resistance profiles using phenotypic (disc-diffusimetric) and genetic (PCR and ERIC-PCR) methods.

Acknowledgements: This paper was co-financed from the Human Capital Operational Program 2014-2020, project number POCU / 380/6/13/125245 no. 36482 / 23.05.2019 "Excellence in interdisciplinary PhD and post-PhD research, career alternatives through entrepreneurial initiative (EXCIA)", coordinator The Bucharest University of Economic Studies

Results: A total of 1 HI/34 WWTP MDR Ab (Is) and 28 WWTP MDR Ab strains (Gl) were isolated and tested for resistance. 40% of the Is clinical and water isolates showed resistance to all antibiotics tested. The resistance rates of Is WWTP vs Gl WWTP Ab strains were 71.4%/17.8 % (SAM), 94.2%/100% (FOX), 100%/82.1% (ATM), 80%/71.4% for (MEM), 82.8%/85.7% (CIP), 82.8%/78.5%

(AK), 77.1%/57.1% (TE) (Table 1). Carbapenemase-encoding genes were revealed in 1 HI and 27 WWTP Ab strains from Iasi and in 18 WWTP Ab strains from Galati. Aminoglycosides-modifying enzymes were detected in 19 WWTP and 1 HI from Iasi and in 9 Gl WWTP Ab strains. The 1HI/34 WWTP Ab strains from Iasi belonged to 3 (Fig. 1) and the 28 Gl WWTP MDR Ab to 6 clones (Fig. 2).

Conclusion: The MDR Ab strains circulating in the hospital and released in the wastewater environments in Northern Romania belonged to multiple clones and revealed high resistance rates to beta-lactams, quinolones, aminoglycosides and tetracyclines, >50% harbouring carbapenemases, thus essentially contributing to the environmental reservoir of antimicrobial resistance.

Biography

Mr. Ovidiu Vrancianu's academic credentials include a BSc in Biology at the Faculty of Biology, University of Bucharest, and an MSc in Applied Genetics and Biotechnology at the same university. In the present, he is a PhD student at the University of Bucharest, Faculty of Biology, The Research Institute of the University of Bucharest, Romania. His current research interest is to investigate the mechanisms of antibiotic resistance and innovative treatment strategies in *Acinetobacter baumannii*.