

## Importance of introduction of multidrug-resistant organisms to UMC Ljubljana by repatriates and foreign citizens – a 7-year retrospective analysis

M. Pirs<sup>1</sup>, T. Lejko Zupanc<sup>2</sup>, B. Beovic<sup>3</sup>, B. ?nidar?ic<sup>2</sup>, M. Mueller Premru<sup>1</sup>

<sup>1</sup>Faculty of Medicine, Institute of clinical microbiology and immunology, Ljubljana, Slovenia ; <sup>2</sup>University Medical Centre, Infection Control Unit, Ljubljana, Slovenia ; <sup>3</sup>University Medical Centre, Department of Infectious Diseases, Ljubljana, Slovenia

**Objective:** Importation of multidrug-resistant organisms (MDRO) from abroad represents an increased risk for acquisition and spread of new resistance and virulence mechanisms. A number of cases with MDRO were documented at University Medical Centre Ljubljana (UMC) in patients repatriated from foreign hospitals and in foreign citizens in particular patients colonized or infected with carbapenemase-producing *Enterobacteriaceae* (CPE). The prevalence of CPE in Slovenia is low and there is low level of awareness of the problems associated with possible importation of MDRO among healthcare workers. UMC has strict infection control guidelines regarding admission of patients who were in contact with foreign healthcare institutions. In order to improve reporting and adherence to infection control guidelines, a lot of effort was spent to increase awareness among healthcare workers. The aim of our study was to determine the scope of the problem introduction of MDRO to UMC by repatriates and foreign citizens represents.

**Methods:** Retrospective analysis of laboratory and patient data was performed for patients that were repatriated from foreign hospitals and foreign citizens treated at UMC between 2007 and November of 2013 that were colonized or infected with MDRO.

**Results:** In total, 100 patients, colonized or infected with MDRO, were repatriates or foreign citizens. In 36 of them (36.0%) colonization or infection with multiple (up to 8) MDRO was noted, 17 (17.0%) were colonized or infected with two, 12 (12.0%) with three, 2 (2%) with four, 4 (4.0%) with five MDRO, one patient was colonized with 8 different MDRO (Table 1). ESBL-producing *Enterobacteriaceae* were found in 62 patients. Majority were *Klebsiella pneumoniae* and *Escherichia coli* (36 and 35 patients respectively). CPE were found in seven, five from Balkan countries, and one each from India and Libya. Predominant CPE was *K. pneumoniae*; KPC, NDM-1, VIM and OXA-48 were detected. Carbapenem-resistant *Acinetobacter baumannii* was found in 20 patients. *Pseudomonas aeruginosa*, resistant to all antipseudomonal beta-lactams was found in six patients. Methicillin-resistant *S. aureus* (MRSA) was found in 39 and vancomycin-resistant enterococci in seven patients.

**Conclusion:** 100 repatriates and foreign citizens, carrying MDRO, were identified during the seven-year period in UMC Ljubljana. Even though such data are not systematically collected and the scope of the problem is underrated, our analysis has shown that introduction of MDR bacteria with repatriates and foreign citizens is a frequent occurrence. Even though we have noticed an increase in the number of repatriated patients and foreign citizens reported to Infection Control Unit in the past two years suggesting that the measures to increase awareness have had some effect more effort must be spent to educate health-care workers to recognize such patients and follow the guidelines for microbiological screening and infection control measures and thus prevent the potential spread of MDRO.

Table 1. MDRO isolated from repatriates and foreign citizens in UMC Ljubljana between 2007 to November 2013.

	SA-MRSA	VRE	ESBL	CPE	CRAB	PA – BLNS
No of patients (total)	39	7	62	7	20	6
Clinical samples	24	2	45	3	15	6
blood cultures	2	0	4	0	2	0
surveillance samples	34	6	51	6	11	1

SA-MRSA – methicillin-resistant *S. aureus*, VRE – vancomycin-resistant *E. faecium* or *E. faecalis*, CPE carbapenemase-producing *Enterobacteriaceae*, CRAB – carbapenem resistant *A. baumannii*, PA – BLNS - *P. aeruginosa* nonsusceptible to antipseudomonal beta-lactam antibiotics

