

## Prevalence of Metallo Beta-lactamase Production and Detection of IMP Type Metallo Beta-lactamase Gene Among Imipenem Nonsusceptible *P. aeruginosa*

Fatemeh Salimi\*; Fereshteh Eftekhari

Department of Microbiology, Faculty of Biological Science, Shahid Beheshti University, Tehran, Iran

f.salimi39@yahoo.com

**Background & Objectives:** Carbapenems are the drugs of choice for treatment of burn infections. However, the emergence of high level of resistance to most b-lactams by acquiring carbapenemases, particularly Ambler class B metallo b-lactamases (MBL), has jeopardized the effectiveness of these agents. Six MBL encoding genes have been identified (IMP, VIM, SPM, GIM, SIM, and AIM). We studied the prevalence of MBL production and the carriage of MBL encoding IMP type gene among imipenem nonsusceptible burn isolates of *P. aeruginosa*.

**Methods:** A total of 135 *P. aeruginosa* isolates were collected between August to November 2011 from burn patients in Motahari Hospital in Tehran. Antimicrobial susceptibility was determined using the disk diffusion methods and MBL production was detected by the double disk synergy test. Presence of MBL encoding gene IMP, was shown by PCR and type specific primers.

**Results:** There was 99% resistance to carbenicillin and ticarcillin, 98% to cotrimoxazole, 96% to ciprofloxacin and aztreonam, 95% to imipenem and meropenem, 94% to piperacillin, 93% to tobramycin, 92% to Cefepime, 90% to Amikacin, 89% to Ceftazidime and 87% to Piperacillin/tazobactam. Of the 128 Imipenem resistant isolates, 32(25%) were MBL producers of which, 19 (59%) harboured the IMP type MBL.

**Conclusion:** Clinical infections with MBL producing *P. aeruginosa* pose major therapeutic challenges. We found that 59% of the MBL producers carried the IMP type. Other MBL genes may be responsible for MBL production in the rest of the MBL positive isolates. Regardless, early detection of MBL production by these multiresistant organisms is critical for choosing the correct antibiotic therapy and preventing the dissemination of resistance genes among the bacterial pathogens.

**Keywords:** *Pseudomonas aeruginosa*; Antibiotic Resistance; Metallo-Beta-Lactamase; IMP Type Gene