Title: Detection of Metallo beta Lactamase Encoding Genes in Clinical Isolates of Pseudomonas aeruginosa by Multiplex Real-Time PCR

Abstract: Background: Metallo beta lactamases are of great concern as the most fearsome mechanisms of drug resistance in bacteria, because MBLs can hydrolyze all β-lactam antibiotics except monobactams. Furthermore the MBL encoding genes which are located on plasmids or integrons facilitate their dissemination among medically important bacteria. Therefore rapid and reliable detection of MBL producing isolates are important in clinical settings.

Objectives: To evaluate Usefulness of real time PCR method for detection of various MBL encoding genes among P. aeruginosa isolates in Orumieh, Iran.

Materials & Methods: A total of 67 carbapenem resistant isolates of P. aeruginosa were collected during August 2007 to June 2008 from Imam Hospital of Orumieh, Iran. Antimicrobial susceptibility testing was performed by Etest strips. DNA extraction of isolates was carried out by boiling method. Amplification of different MBL genes were performed by using type specific primers for IMP, VIM, GIM, SPM and SIM types in Corbett RG-300 Rotor-Gene Real time PCR as described by Mendes et al. The melt report and quantization reports of PCR reactions were analyzed for presence of expected amplified products.

Results: Amplification of MBL encoding genes by real time PCR showed that 12 isolates carried blaVIM type MBLs and only 3 isolates were positive for blaIMP type genes. We didn't find any GIM, SPM and SIM type MBLs in this study. All of MBL producing isolates were non-susceptible to imipenem, majority of them belonged to MDR phenotype and serologically belonged to O10 and O11 serotypes.

Conclusion: Our findings showed the presence of MBL positive P. aeruginosa in the study region, Since MBLs producing P. aeruginosa is an increasing problem reported from different parts of the world, it is necessary to screen all imipenem non-susceptible isolates for MBLs production. Therefore it's important to screen all imipenem non-susceptible isolates for MBL production.

Keywords: Pseudomonas aeruginosa, Antimicrobial resistance, Real time PCR, Metallo beta lactamases.

Presentation: Poster