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Paper Poster Session
Focus Acinetobacter

Detection of multidrug resistant (MDR) Acinetobacter baumannii clonal complex 92 in Iran

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Background: *Acinetobacter baumannii* is emerging as an important global opportunistic nosocomial pathogen. *A. baumannii* infection is difficult to treat due to its innate and acquired antimicrobial resistance. The problem is compounded by increasing resistance to broad-spectrum antibiotics (Including carbapenems) particularly in developing countries, such as Iran. We study the distribution of *bla OXA -type* carbapenemases genes by real-time PCR assay among *A. baumannii* isolated from Tehran hospitals. Pulsed-Field Gel Electrophoresis (PFGE) and Multilocus Sequence Typing (MLST) were conducted for molecular typing of strains. All isolates were confirmed as *Acinetobacter baumannii* by MALDI-TOF MS and were resistant to both imipenem and meropenem according to EUCAST. The real-time PCR has shown the presence of $bla_{OXA\text{-}23\text{-}like}$ and $bla_{OXA\text{-}51\text{-}like}$ genes in twenty and sixteen isolate respectively. PFGE analysis revealed 23 pulsotypes. ST137 / CC92, international clone II (n=2) and ST189 / CC92, international clone II, (n=3) were detected by MLST. The emergence of successful global clones (ST189 and ST137 / CC92) of carbapenem-resistant *A. baumannii* in Tehran hospitals is concerning**.**

Material/methods: Twenty-three multidrug-resistant clinical isolates were selected from a collection of *A. baumannii* samples isolated from different clinical specimens. The strains were sent to Karolinska University Hospital, Stockholm, Sweden, for further characterization. Identification of the isolates was confirmed using matrix-assisted laser desorption/ionisation time-of-flight mass spectrometry (MALDI-TOF MS). The antimicrobial susceptibility testing was carried out with disk diffusion according to EUCAST for 5 antimicrobial agents including gentamicin, imipenem, meropenem , ciprofloxacin and trimethoprim/sulfamethoxazole. Isolates were investigated using real-time PCRamplification and published primers for the presence of the 16S rRNA methylase and bla_{OXA}-carbapenemase genes. Clonal relationships were determined by pulsed-field gel electrophoresis (PFGE) and Multilocus sequence typing (MLST) was done to identify the clusters of selected isolates with ≥ 85 % PFGE .

Results: The isolates were eventually identified as *Acinetobacter baumannii* by MALDI-TOF MS with high score values. A total of 23 *A. baumannii* isolates were resistant to both imipenem and meropenem, 22 isolates were resistant to ciprofloxacin, 21 to gentamicin, and 20 to trimethoprim/sulfamethoxazole. Twenty isolates had positive results for $bla_{OXA\text{-}23\text{-}like}$ and 16 for $bla_{OXA\text{-}51\text{-}like}$. Co-expression of $bla_{OXA\text{-}23\text{-}like}$ and $bla_{OXA\text{-}51\text{-}like}$ were found in 15 cases. All isolates were negative for all 16S rRNA methylase genes tested. PFGE analysis revealed 23 pulsotypes .Using a ≥ 85 % similarity cut-off, 8 distinct PFGE clades were defined. Identified STs for the respective clades were ST137 / CC92, international clone II (n=2), ST189 / CC92, international clone II, (n=3) and ST337 (n=3).

Conclusions: The *bla*$_{OXA\text{-}23\text{-}like}$ gene was the most frequent carbapenemase identified among resistant *A. baumannii* isolated in Tehran hospitals. Worldwide clonal complex 92 (CC92) / International clone II *A. baumannii* represent the most sampled and widespread sequence types.