Original Article

TANAFFOS

Frequency of Multi-Drug Resistance and Molecular Characteristics of Resistance to Colistin in *Acinetobacter baumannii* Collected from Patients in Intensive Care Units with Ventilator-Associated Pneumonia

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Background: *Acinetobacter baumannii* is one of the most common causes of ventilator-associated pneumonia (VAP) in patients hospitalized in ICU. Multiple resistance has resulted in excessive use of Colistin antibiotic, which is the latest treatment option for this bacterium. Therefore, the purpose of this study was to determine the abundance of multi-resistance and molecular characteristics of resistance to colistin among *A. baumannii* isolated from patients that are infected with VAP and hospitalized in ICU of "Qazvin" and "Masih Daneshvari" hospitals.

Materials and Methods: In this study, 200 A. *baumannii* isolates related to VAP were collected from ICU of "Masih Daneshvari" (2012-2018) and "Qazvin" (2017-2018) hospitals, from bronchoalveolar lavage & tracheal aspirate specimens. Isolates were detected as *A. baumannii* by PCR with specific primers of the bla$_{OXA-51-like}$ gene. Antibacterial susceptibility of isolates to colistin was determined by the MIC method, and other antibiotics were examined by the disk diffusion method, according to the CLSI criteria. Multi-drug resistance (MDR) and extended–drug resistance (XDR) isolates were determined according to standard definitions of the CLSI.

Results: All the isolates were susceptible to colistin. Moreover, they were resistant to piperacillin, piperacillin-tazobactam, ceftazidime, cefotaxime, ceftriaxone, amikacin, gentamycin, levofloxacin, co-trimoxazole, and ciprofloxacin. Antimicrobial resistance rates for tetracycline and ampicillin-sulbactam were 8.5% and 20%, respectively. All isolates were MDR and XDR. All isolates were susceptible to colistin (MIC50=1 and MIC90=2 μg/ml). The sequencing results did not show any point mutation in *pmr CAB* genes, and *mcr-1* gene was not detected in any isolates.

Conclusion: In this study, all *A. baumannii* isolates collected from VAP patients were MDR and XDR. Although all isolates were susceptible to colistin, and this agent seems the most appropriate antibiotic for treatment of VAP, colistin resistance can become endemic in the world rapidly due to plasmid-mediated mobile colistin resistance *mcr* genes.

Key words: *Acinetobacter baumannii; MDR; XDR; Colistin; pmr CAB; mcr-1*