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Molecular Characterization of Carbapenem-Resistant Strains of *Klebsiella pneumoniae* Isolated from Iranian Patients: First Identification of *bla*_{KPC} Gene in Iran

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Author information

Saman Nobari,¹ Fereshteh Shahcheraghi,¹ Fatemeh Rahmati Ghezelgeh,¹ and Babak Valizadeh²¹Department of Bacteriology, Microbiology Research Center, Pasteur Institute of Iran, Tehran, Iran.²Bahar Medical Laboratory, Tehran, Iran.

Address correspondence to:

Fereshteh Shahcheraghi, PhD

Department of Bacteriology

Microbiology Research Center

Pasteur Institute of Iran

Tehran 13164

Iran

E-mail: shahcheraghifereshteh@yahoo.com;shahcheraghi@pasteur.ac.ir

ABSTRACT


Multi-resistant *Klebsiella pneumoniae* has been considered a serious global threat. This study was initiated to investigate carbapenem resistance among *K. pneumoniae* isolates in Iran and to detect carbapenemases in resistant strains. From 2009 to 2012, 180 *K. pneumoniae* strains were collected from Tehran hospitals. Of the isolates, 42 isolates (23.3%) were resistant to meropenem, 29 isolates (16.1%) were resistant to ertapenem, and 14 isolates (7.7%) were resistant to imipenem. All of carbapenem-resistant isolates were also resistant to the third generation of cephalosporins. modified Hodge test was positive in 25 (59.5%) of carbapenem-resistant isolates showing carbapenemase production. *bla*_{NDM} and *bla*_{VIM} genes were identified in three and five carbapenem-resistant isolates, respectively. One isolate showed presence of *bla*_{KPC} gene. Class 1 integrons were detected in 14 carbapenem-resistant isolates. The most important finding about class 1 integrons was identification of an integron containing metallo- β -lactamase gene *VIM-1* that also harbored *dfrA27* and *arr3* genes. It is important to note that *K. pneumoniae* carbapenemase and New Delhi metallo- β -lactamase-positive isolates identified in this study showed resistance to the majority of routine antimicrobial agents, including all β -lactams and other classes of antibiotics. To our knowledge, this is the first identification of *bla*_{KPC} and *bla*_{VIM-1} genes among isolates of *K. pneumoniae* in Iran.

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