

# Emergence of tigecycline-resistant *Klebsiella pneumoniae* ST11 clone in patients without exposure to tigecycline

Babak Asghari

Tabriz University of Medical Sciences, Iran

## Abstract

**Introduction:** Tigecycline is a unique class of semi-synthetic glycolcyclines developed to treat infections caused by multidrug-resistant *Klebsiella pneumoniae*. In the past decades, eight tigecycline-resistant *Acinetobacter baumannii* isolates have been identified in Tehran and no *Klebsiella pneumoniae* has been reported.

**Methodology:** To elucidate the mechanism of *K. pneumoniae* efflux pump-mediated resistance, the expression of efflux pump genes (*oqxA*, *oqxB*, *acrA*, *acrB*, *tolC*) and regulators (*acrR*, *ramA*, *marA*, *soxS*, *rarA*, *rob*) was investigated by real-time RT-PCR. Multilocus sequence typing (MLST) of tigecycline-resistant strains was also performed.

**Results:** Compared to the tigecycline sensitive strain K32 (negative control), all resistant strains showed higher expression levels of efflux genes and regulatory factors. Three tigecycline-resistant strains (K53, K67, K79) showed higher levels of *rarA* expression (38.1-fold, 41-fold and 24-fold, respectively) and *oqxB* pump gene (48.2-fold, 60-fold and 58-fold, respectively). The increased expression of *acrB* was associated with the expression of *ramA*. However, to the best of our knowledge, studies on the mechanisms of resistance of *K. pneumoniae* strains to tigecycline are limited, especially in developing countries such as Iran.

**Conclusions:** In the present study, we found that both AcrAB-TolC and OqxAB efflux pumps may play an important role in tigecycline resistance in *K. pneumoniae* isolates. Finally, the emergence of ST11 molecular type of resistant isolates should be monitored in hospitals to identify factors leading to tigecycline resistance.

**Received:** July 05, 2022; **Accepted:** July 13, 2022; **Published:** July 20, 2022

## Biography

Babak Asghari, Ms, PhD(2009-2014) of Medical Bacteriology, Department of Medical Microbiology, School of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran.