Mechanism of imipenem Resistance in Acinetobacter baumannii Isolates from a Regional Hospital in Taiwan

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ABSTRACT
Acinetobacter baumannii is an opportunistic pathogen causing nosocomial infections in immunocompromised and elderly patients. Imipenem is antibiotic of choice to treat such infections. However, the fast emerging drug-resistant A. baumannii poses difficulty in the treatment usage. In order to elucidate the resistance mechanisms, 20 imipenem-resistant A. baumannii clinical isolates from a regional hospital in Taiwan were collected and examined in this study. E-test analysis showed all isolates were susceptible to colistin, and twelve isolates were intermediately resistant to tigecycline. All isolates were resistant to imipenem, ciprofloxacin, and ceftazidime. PCR amplification and sequence analysis identified blaOXA-23, bla OXA-66 and blaADC-25 in these isolates. The upstream ISAba1 contributing to its downstream gene expression, is always found in blaOXA-23 and blaADC-25, and in blaOXA-66 of three isolates. Further sequence analysis showed that blaOXA-23 was carried by transposon Tn2006. The imipenem resistance in the isolates of A. baumannii was likely due to the expression of either blaOXA-23 or blaOXA-66. We concluded that imipenem resistance in A. baumannii isolates from the regional hospital was likely due to the hpper-expression of OXA-type β-lactamases. Colistin still remained active in vitro (MIC 0.38 - 0.75 μg / ml).

Keywords : Acinetobacter baumannii, imipenem, β-lactamases, blaOXA-23, blaOXA-66, blaADC-25, ISAba1

