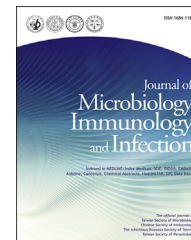


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## Correspondence

# First report of OXA-48 carbapenemase-producing *Escherichia coli* in Taiwan



Dear Editor,

Though OXA-48 producing *Klebsiella pneumoniae* has emerged in Taiwan,<sup>1</sup> OXA-48 producing *Escherichia coli* was not found in Taiwan before.

A 55-year-old Cambodia woman was diagnosed with breast cancer in Singapore in 2013. The tumor enlarged gradually with an open wound, and she received chemotherapy in Vietnam four months later. She was brought to Kaohsiung Medical University Hospital for further management in June 2014. Her initial WBC count was  $6300 \times 10^6/L$ , Hb: 12.1 g/L, PLT:  $103000 \times 10^6/L$ . The pus culture from her breast lesion grew *E. coli*. Antimicrobial susceptibility was determined by the broth micro-dilution method according to the guidelines of the Clinical and Laboratory Standards Institute.<sup>1</sup> The *E. coli* isolate was found resistant to ampicillin, piperacillin/tazobactam, ceftazidime, cefepime, meropenem, TMP/SMX and levofloxacin, but is susceptible to gentamicin, amikacin and tigecycline. Minimum inhibitory concentrations (MIC) of meropenem and ertapenem were 4 and  $\geq 8$   $\mu\text{g/mL}$ , respectively. This pathogen did not cause systemic inflammatory symptoms, and no antimicrobial therapy was given. Infection control measures were implemented immediately and no OXA-48-carrying isolate was found in the hospital for the next 6 months.

The modified Hodge test of the meropenem-resistant *E. coli* is positive which indicates the presence of carbapenemase.<sup>2</sup> PCR for carbapenemase genes including *bla*<sub>KPC</sub>, *bla*<sub>NDM</sub>, *bla*<sub>IMP</sub>, *bla*<sub>VIM</sub>, *bla*<sub>OXA</sub> and other beta-lactamases genes (*bla*<sub>SHV</sub>, *bla*<sub>TEM</sub>, *bla*<sub>OXA</sub>, *bla*<sub>GES</sub>, and *bla*<sub>CTX-M</sub>) was also performed.<sup>3</sup> The isolate was confirmed to carry OXA-48 and CTX-M-1-group beta-lactamase with loss of outer membrane proteins (OMP) A and F. Multilocus sequence typing revealed that the isolate belonged to ST-405 clone of *E. coli*.

OXA carbapenemase possess relatively weaker ability to hydrolyze carbapenem than oxacillin; and clavulanic acid

fails to inhibit OXA hydrolysis. OXA-positive isolates with ESBLs, porin loss, or alteration render them unresponsive to antibiotics treatments and contribute to greater MICs.<sup>2</sup> Our reported isolate, in addition to the loss of outer membrane protein A and F, possessed OXA-48 and CTX-M-1-group beta-lactamases, hence granting them a high MIC against carbapenems.

OXA-48 was first identified in *K. pneumoniae* in Istanbul in 2001. Then OXA-48 producing *E. coli* was first identified in Ankara, Turkey in 2004.<sup>4</sup> In 2012, an OXA-48 producing *E. coli* was reported in France from a patient who was previously admitted to a Cambodia hospital. In the same year, the first OXA-48 producing *K. pneumoniae* and *E. coli* in East and Southeast Asia were reported in Japan, however, these isolates were collected from a patient previously traveled in Southeast Asia.<sup>5</sup> Our reported OXA-48 producing *E. coli* was also from Southeast Asia and had CTX-M-1-group gene. It shares similar travel history and the same beta-lactamases of the OXA-48 producing isolate reported in Japan.<sup>5</sup>

As the resistance mechanism of *E. coli* to carbapenem in Taiwan is mainly ESBL and/or AmpC beta-lactamases in combination with outer membrane protein loss,<sup>3</sup> modified Hodge test could be useful to differentiate the carbapenemase producing isolates.

In conclusion, the first OXA-48 producing *E. coli* in Taiwan was found in a Cambodian patient from Southeast Asia. Booming international travel has paved the way for emerging infectious diseases to spread beyond borders. With prompt laboratory detection, infection control measures can be implanted immediately.

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(KMUH103-3R14). The case report has been presented as a poster in ICPIIC (International Consortium for Prevention and Infection Control) 2015 conference (Poster number: P126).

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