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Title: Outbreak Investigation of Carbapenem-Resistant *Klebsiella pneumoniae* in a Regional Hospital — Taiwan, June 2015–February 2016

Abstract Text:

Background: Carbapenem-resistant *Enterobacteriaceae* (CRE) is highly transmissible in healthcare settings and associated with higher rates of mortality. Taiwan CDC implements CRE surveillance in 2010 for voluntary report. Since October 2015, an increase in reports of carbapenem-resistant *Klebsiella pneumoniae* (CRKP) from a regional hospital was found; the majority were isolated from patients in intensive care unit (ICU). We conducted a case-control study to identify risk factors for CRKP infection/colonization.

Methods: Cases were defined as ICU patients with first-ever CRKP isolates after 48 hours of ICU admission during June 2015–February 2016, and controls were selected from other ICU patients with carbapenem-sensitive *Klebsiella pneumoniae* (CSKP) isolates during the same period. We reviewed medical records to collect information on demographics, comorbidities, catheters, invasive procedures during hospitalization, prior endoscopy examination within three months, prior antimicrobial exposure within one month, and mortality. We used univariate and multivariate logistic regression to compare odds of potential risk factors between cases and controls.

Results: Of 41 cases and 45 controls, the median age was 77 and 79 years ($p = 0.72$), and case-fatality rate was 51% and 31 % (OR: 2.33; 95% CI: 0.97–5.60). Longer interval from ICU admission to CRKP/CSKP specimen collection ($p = 0.04$), central venous catheter (CVC) insertion (OR: 3.84; 95% CI: 1.57–9.40), blood transfusion (OR: 2.60; 95% CI: 1.01–6.70), and prior 2nd-generation cephalosporin exposure (OR: 10.42; 95% CI: 1.24–87.53) were associated factors in univariate analysis. In multivariate analysis, CVC insertion was independently associated with CRKP isolation (OR: 2.82; 95% CI: 1.09–7.33).

Conclusions: Central venous catheterization is an associated factor with CRKP acquisition. We recommend to re-evaluate bundle care practices and consider active surveillance for patients with CVC.

Keywords: *Klebsiella pneumoniae*, Nosocomial Infection, Disease Outbreaks

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