

# EPIDEMIOLOGY AND PROGNOSTIC FACTORS OF CARBAPENEM-RESISTANT *KLEBSIELLA PNEUMONIAE* INFECTION IN WUHAN, HUBEI, CHINA (JANUARY 2015 - JULY 2017)

Meng-Lin Zou, Jing-Feng Zou, Xing-Xing Hu, Chao-Jie Wei and Zhen-Shun Cheng

Department of Respiratory medicine, Zhongnan Hospital of Wuhan University, Wuhan, Hubei Province, PR China

**Abstract.** Prevalence of carbapenem-resistant *Klebsiella pneumoniae* (CRKP) has been increasing during the past decades with a high rate of mortality. A retrospective 1:2 case-control study was conducted at Zhongnan Hospital, Wuhan University, Hubei Province, China from January 2015 to July 2017 to identify risk factors associated with CRKP infection, mortality and prognostic factors among adult inpatients ( $n = 83$ ) with CRKP infection and matched adult inpatients ( $n = 166$ ) with carbapenem-susceptible *K. pneumoniae* (CSKP) infection at the same site and time of isolation. Univariate and multivariate logistic regression analysis were performed to assess risk factors associated with CRKP infection and predictors of death. Incidence of CRKP in 2015, 2016 and 2017 was 5, 6 and 10%, respectively. Multivariable analysis identified cerebrovascular disease (odds ratio (OR) = 2.10, 95% confidence interval (CI): 1.06-4.13,  $p$ -value = 0.032), central venous catheter catheterization (CVC) (OR = 2.03, 95% CI: 1.07-3.85,  $p$ -value = 0.029), indwelling gastric tube (OR = 2.00, 95% CI: 1.05-3.79,  $p$ -value = 0.034), and exposure to carbapenem (OR = 3.16, 95% CI: 1.58-6.30,  $p$ -value = 0.001), cefoperazone plus sulbactam (OR = 2.99, 95% CI: 1.59-5.64,  $p$ -value = 0.001) or fluoroquinolones (OR = 2.54, 95% CI: 1.23-5.24,  $p$ -value = 0.012) as independent risk factors for CRKP infection. Mortality in CRKP (29%) is significantly higher than that of CSKP (11%) group ( $p$ -value = 0.001). Cardiac disorders (OR = 5.70, 95% CI: 1.02-32.02,  $p$ -value = 0.048), CVC (OR = 13.94, 95% CI: 2.15-90.40,  $p$ -value = 0.006), indwelling gastric tube (OR = 43.40, 95% CI: 4.01-470.35,  $p$ -value = 0.002), and decrease in absolute lymphocyte counts (OR = 5.49, 95% CI: 1.18-25.46,  $p$ -value = 0.030) were predictors for higher mortality rate. These findings should be of value in developing preventive measures to reduce mortality among inpatients with CRKP infection.

**Keywords:** carbapenem-resistant *Klebsiella pneumoniae*, mortality, prognostic factors, risk factors

---

Correspondences: Chao-Jie Wei and Zhen-Shun Cheng, Department of Respiratory Medicine, Zhongnan Hospital of Wuhan University, 169 Donghu Ave, Wuhan, Hubei, 430000, People's Republic of China.

Tel: +86 136 2728 8300

Email: zhenshun\_cheng@126.com