Australian National University

Research School of Population Health Seminar Series

MAE SEMINAR

Risk factors for acquisition of imipenamase-4 producing Enterobacteriaceae in a health service outbreak in Melbourne, Australia: a matched case control study

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Thursday 20th August 2020, 13:15 – 13:30

Zoom Link Meeting ID: 989 2327 2351 Password: 037507

Genevieve (BN, MPH) is an MAE Scholar at the Australian Government Department of Health, National Incident Response Division, Epidemiology and Surveillance Second and Honorary Research Fellow at Alfred Health. She has a background in critical care nursing and project management. Prior to her MAE, Genevieve was the international project manager for the Randomised, Embedded, Multi-factorial, Adaptive Platform Trial for Community-Acquired Pneumonia and Short Period Incidence Study of Severe Acute Respiratory Infection at Monash University.

Abstract

Background: Healthcare-associated colonisation and infections caused by carbapenemase-producing Enterobacteriaceae (CPE) are increasing, with few effective antibiotics available to treat CPE. Several types of CPE exist, in Australia imipenamase-4 (IMP4) has become particularly prevalent accounting for 57% of all CPE reported in 2019 (504/877). It was first reported in 2004, since then multiple healthcare associated outbreaks have been reported. In 2018, a health service in Melbourne, Victoria reported an outbreak of CPE IMP4. The aim of this study was to describe the risk factors associated with CPE IMP4 colonisation and infection.

Methods: A retrospective matched case control study was performed from October 2018 to October 2019. Cases, where IMP4 producing Enterobacteriacae were isolated from clinical or screening specimens, were matched to two controls, IMP4 negative on screening specimens, on hospital ward, length of stay and the closest negative swab temporally to the case's positive swab. Univariate conditional logistic regression was used to calculate odds ratios (OR).

Results: 114 cases were matched to 228 controls, univariate analysis revealed a number of risk factors associated with IMP4 acquisition including, admission to intensive care (OR 3.4, 95% confidence interval [CI] 1.7 – 6.7, p-value 0.00), presence of an indwelling urinary catheter (OR 3.0, 95% CI 1.7 – 5.5, p-value 0.00), central venous catheter (OR 5.3, CI 2.5 – 11.1, p- value 0.00), and use of trimethoprim/sulfamethoxazole in the 30 days preceding specimen collection date (OR 3.7, CI 2.0 – 6.9, p-value 0.00).

Conclusion: Clinicians should be aware of the implications of these findings and implement interventions to limit patient exposure to these risk factors, including restricting the use of central venous catheters and indwelling urinary catheters and preforming regular environmental and patient screening for CPE in the intensive care units.

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