Control of vancomycin-resistant Enterococcus faecium (VRE) at the scale of a local hospital

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Introduction
Vancomycin-resistant Enterococci (VRE) is an important cause for health care associated infections. Not only can VRE be colonized in human gastrointestinal tract for a prolonged period of time (1), it can also be easily transmitted via healthcare workers’ hands or via contaminated hospital environments and equipment. Colonization with VRE is associated with increased risk of infection with VRE and antimicrobial treatment option is limited; thus, increasing the morbidity and mortality in patients infected with VRE and prolonging hospital stay (2,3). Increasing number of sporadic cases of VRE has been observed in Hong Kong and nosocomial outbreaks have been reported since late 2010 (4). In 2013, a total of seven nosocomial outbreaks of VRE have occurred in Kwong Wah Hospital, comprising a total of 106 cases. The present study describes the VRE infection control measures that allowed the controlling of further VRE outbreaks in a local hospital.  
Objectives
To describe and analyze the various infection control measures to control the nosocomial transmission of VRE in an 1100-bed acute care hospital.

Methodology
This is a retrospective analysis of the clusters of VRE that has occurred in 2013-2014 in an acute care hospital. To eradicate the ongoing nosocomial transmission, a multi-facet approach was adopted, which include: (1) formation of a task group; (2) regular staff education and feedback on outcomes of infection control measures; (3) strict patient isolation and cohort; (4) enhanced environmental cleansing and surveillance; (5) increase vigilance on infection control practices during patient care; and (6) enhanced VRE screening in high risk patients.

Result
In 2013, there were a total of 14 patients with VRE identified from clinical specimen. After contact tracing for each clinical case, 7 episodes of outbreaks were reported, with 3404 patients identified as contacts. 1159 VRE screening cultures were performed, and 99 contacts were identified as VRE carrier. The secondary VRE positive rate ranges from 3.15% to as high as 14.3%. Clinical staffs were provided with regular education sessions and feedbacks on the infection control measures implemented. Hand hygiene compliance in a ward with ongoing VRE transmission improved from 43% to 96% over a one-month period. Enhanced environmental cleansing and regular environmental sampling helped to eliminate contamination from patient areas, common ward areas, shared equipment and procedures trolleys. The enhanced targeted admission screening for VRE, which began in November 2013, identified 71 VRE carriers from 8188 screening cultures performed. Furthermore, a clustering of silent VRE carriers were identified in the male orthopedics ward based on results from the targeted screening and subsequent enhanced biweekly screening. In 2014, a total of 11 patients with VRE isolated from clinical specimen were identified. After contact tracing, only one episode of outbreak was reported, with 177 patients identified as contacts. Forty-one screening cultures were taken and two contacts were identified as VRE carriers translating to a secondary VRE positive rate of 4.9%. Conclusion: The enhanced infection control measures have controlled the nosocomial outbreaks of VRE in Kwong Wah Hospital. VRE has not been eradicated from the hospital; therefore, the continuous support and effort from frontline clinical staffs, hospital administrators and infection control team is essential in preventing further nosocomial transmission.