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Objectives: In Vietnam, the burden of healthcare-associated infections (HAIs), especially by multidrug-resistant organisms (MDROs), can be greater at national hospitals where a high number of severe patients from lower-tier hospitals are received for treatment. To reduce MDRO and HAI incidences at the tropical diseases intensive care unit (ICU) of Cho Ray Hospital, the final line of treatment for 20 southern provinces of Vietnam, a comprehensive infection prevention bundle was developed and implemented in 2019. In this retrospective study, we evaluated the effectiveness of this intervention in preventing MDRO infections and HAIs among patients at risk. **Methods:** The infection prevention bundle included elements to improve administration controls, environmental controls, and personal protective equipment usage. The bundle was implemented via training and active monitoring. Medical data, such as microbiology results, length of hospital stay, treatment cost of all patients admitted to the targeted ICU, and data on adherence to the bundle elements, were collected via routine monitoring from July to December 2019. These data were reviewed and analyzed. An independent 2-sample *t* test was used to calculate the significance of the differences in MDRO and HAI rates before and after the intervention. **Results:** The mean number of MDRO infections decreased significantly after implementation of the infection prevention bundle (7.0 vs 3.3; *P* = .011). HAI and ventilator-associated pneumonia (VAP) rates also decreased significantly (5.9 vs 3.7; *P* = .013 and 20.4 vs 13.7; *P* = 0.047, respectively). The mean total treatment cost per patient was reduced by 1.8 million VND (US \$76.76). Bundle-element adherence was high throughout the intervention period, ranging from 72.7% (putting MDRO sign on beds) to 100% (hand hygiene, cohort patients, environment cleaning). **Conclusions:** Implementation of an appropriate infection prevention bundle with a high adherence rate by healthcare workers helped to effectively reduce MDRO infection and HAI rates in the tropical diseases ICU.

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Subject Category: Multidrug-Resistant (MDR) Organisms

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Risk factors associated with mortality among carbapenem-resistant Enterobacteriaceae inpatient in a tertiary-care teaching hospital in Malaysia
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Objectives: Carbapenem-resistant Enterobacteriaceae (CRE) is a multidrug-resistant gram-negative bacteria (MDR-GNB) that is rapidly emerging as a life-threatening nosocomial disease in many countries. We sought to identify the risk factors associated with mortality for carriage of CRE in patients at a tertiary-care teaching hospital. **Methods:** A retrospective observational study was conducted between January 2020 to December 2021 in a tertiary-care teaching healthcare facility, University Malaya Medical Centre in Malaysia. The study included all inpatients aged ≥18 years who

had a CRE infection or were colonized during the study period. The genotype was identified by polymerase chain reaction (PCR). Statistical analysis of data including a multivariate logistic regression analysis was conducted using SPSS version 23.0 software. **Results:** In total, 176 cases of CRE (130 infection and 46 colonized) were identified, and the mortality rate was 31.8%. The main sources of CRE were rectal swab (61.9%), blood (11.9%), and respiratory sources (11.9%). *Klebsiella pneumoniae* (55.7%) was the predominant species, followed by *Escherichia coli* (21.6%). Among the isolates, 17.7% were non-CPE-CRE and 82.3% were CPE-CRE: NDM (69.3%) and OXA (10.8%). In multivariate analysis, the factors associated with mortality were older age (OR, 1.040; 95% CI, 1.012–1.069), longer length of stay (OR, 0.974; 95% CI, 0.955–0.994), use of central venous catheter (OR, 0.287; 95% CI, 0.094–0.878), and arterial lines (OR, 0.292; 95% CI, 0.095–0.891). **Conclusion:** Patients with CRE had a high mortality rate. Older age, longer duration of stay, indwelling CVC and arterial line were independent risk factors for death. Infection prevention and control measures to reduce CRE, such as active surveillance, contact precautions, compliance to intravenous catheter care bundles, healthcare worker education, and hand hygiene adherence, should be implemented.

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Detection of carbapenemase genes in donor lungs at the point of care before transplantation reduces the risk of carbapenem-resistant Enterobacteriaceae-associated donor-derived infection in lung-transplant recipients

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Objectives: The number of lung transplants is increasing year by year in China and globally. With the widespread use of donation after brainstem death (DBD) donor lungs and donation after circulatory death (DCD) donor lungs, donor-derived infection (DDI) poses a major challenge in lung transplantation. Using donor lungs infected or colonized with carbapenem-resistant Enterobacteriaceae (CRE) may have serious implications in lung-transplant recipients. Currently, traditional microbial culture along with antimicrobial susceptibility testing cannot fully meet the need for rapid and accurate diagnosis of CRE infection in a donor before organ harvest. **Methods:** The Xpert Carba-R device (Cepheid, Sunnyvale, CA) was used to detect and differentiate *Klebsiella pneumoniae* carbapenemase (KPC), New Delhi metallo-β-lactamase (NDM), Verona integron-encoded metallo-β-lactamase (VIM), active-on-imipenem (IMP), and OXA-48 carbapenemase genotypes in bronchial lavage fluid from donor lungs before organ harvest. Positive detection of 1 or more of these genotypes indicated a potentially CRE-infected donor lung, and these organs were removed from the lung transplantation cohort. Donor lungs negative for all KPC, NDM, VIM, IMP, and OXA-48 genotypes determined by the Xpert Carba-R device were used for lung transplantation. The incidence of CRE-associated DDI and infection-related complications were compared in the Xpert Carba-R screening group and an historic control group. **Results:** In this study, 21 donor lungs were tested with the Xpert Carba-R device to detect and differentiate carbapenemase genotypes. Among them, 4 were positive for 1 or more carbapenemase genotypes and were discarded, and the remaining 17 donor lungs showing no carbapenemase gene presence were used for lung transplantation. No CRE-associated DDI occurred in these 17 lung-transplant recipients. **Conclusions:** Rapid and accurate detection of the carbapenemase gene in donor lungs at the point of care before transplantation using the Xpert Carba-R device reduced the risk of CRE-associated DDI in lung-transplant recipients.

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