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Letter to the Editor

Strategy to limit multidrug-resistant *Acinetobacter baumannii* transmission in a cohort coronavirus disease 2019 (COVID-19) critical care unit

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To the Editor—Coinfection with multidrug-resistant organisms (MDROs) among coronavirus disease 2019 (COVID-19) patients is common in critical care patients with a prolonged length of stay in critical care units, likely due to the coadministration of high-dose steroids and the prolonged duration of mechanical ventilation.[1] The control of MDROs among COVID-19 patients is also difficult, given the requirement for airborne plus contact isolation among these patients and the difficulty in wearing and changing personal protective equipment (PPE) in a critical care unit.[2] The situation is much more challenging in middle- and lower-income countries where cohort areas in airborne-isolation critical care units are often designed, instead of single airborne-isolation rooms in the critical care unit. We report the experience of controlling an MDR *Acinetobacter baumannii* outbreak in a COVID-19 critical care unit that featured airborne isolation cohorting areas together with limited standard single airborne isolation rooms in Thailand.

On March 1, 2021, at Thammasat University Hospital (Pratum Thani, Thailand), the first case of MDR *A. baumannii* was detected in a COVID-19 critical care unit, followed by 1 additional patient who was located next to the index patient 2 days later in the same cohorting area. In this 10-bed critical care unit, there were 2 sections of 4-bed airborne isolation cohort areas and 2 single-room beds which were airborne isolation rooms. The nurse-to-patient ratio in this unit was 2.5 to 1. After the detection of the first case, a root-cause analysis revealed the possibility of cross transmission because healthcare personal (HCP) are unable to change PPE between caring for patients in the cohort area as well as the possibility of an unrecognized case of MDR *A. buamannii* referred from another hospital. A policy to prevent transmission was initiated that included isolation of MDR *A. baumannii* patients in single-bed isolation rooms, assigning specific nurses to care for cases with MDR *A. baumannii*, changing gloves between cases, putting an extra sheet cover on the provider between care for MDR *A. baumannii* cases and daily environmental disinfection in cohort and single beds with a quaternary ammonium compound. Feedback regarding compliance with infection prevention practices by HCP was given daily. After 2 weeks, 4 additional MDR *A. baumannii* cases occurred in the cohort area (the incidence rate, 16.9 cases per 1,000 patient days), despite full compliance with policies. A subsequent root-cause analysis suggested the possibility of widely disseminated environmental contamination with MDR *A. baumannii* together with the possibility of cross transmission of MDR *A. baumannii* by HCP unable to change gowns between patients in the cohort area.

Additional interventions at this stage included unit closure for hydrogen peroxide vapor disinfection, development of risk stratification criteria for housing high-risk patients with MDR *A. baumannii* in the 2 isolation rooms, development of an antibiotic stewardship program to limit broad-spectrum antibiotics and to de-escalate broad-spectrum antibiotics among COVID-19 patients, and development of a policy to discontinue isolation for COVID-19 patients.[3] Continuous monitoring and feedback of MDR *A. baumannii* incidence and infection prevention compliance with such policies among HCP was performed daily. During the subsequent 8 weeks, 2 additional cases of MDR *A. baumannii* were detected. A significant reduction in MDR *A. baumannii* incidence occurred compared to the period before the intervention: 16.9 cases per 1,000 patient days versus 3.6 cases per 1,000 patient days ($P < .001$). Infection prevention compliance monitoring among HCP indicated full compliance with all components of infection prevention.

It is well recognized that MDR *A. baumannii* are selected by use of broad-spectrum antibiotics and often have an environmental reservoir that can facilitate rapid spread in critical care units if appropriate interventions are not introduced.[4,5] Also, the constant use of gloves and gowns during a SARS outbreak led to an increase in transmission of MDROs, particularly methicillin-resistant *Staphylococcus aureus*.[6] Outbreaks of MDR *A. baumannii* can be more difficult to control in middle- and lower-income countries where infrastructure may not be adequate (eg, suboptimal design of negative pressure airborne isolation units, inadequate nurse-to-patient ratio). Such conditions require a practical strategy to control MDROs in the resource limited settings. Our experience suggests that policies that using an additional sheet to protect contamination of HCP gowns, frequent changes of gloves, assignment of specific nurses to care for MDR *A. baumannii* cases as well as basic environmental disinfection were not able to terminate an

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outbreak of MDR *A. baumannii* if the HCP could not change PPE between patients in cohort areas. Additional strategies are needed in situations that do not allow changing PPE easily between cases in the cohort areas. These strategies must feature multimodal approaches that include risk stratification for index patients that may potentially harbor MDR *A. baumannii* with isolation in single rooms, an antibiotic stewardship program for COVID-19 patients, and policies to discontinue COVID-19 isolations as well as a policy to perform robust terminal environmental disinfection. Such strategies, together with fully compliance with infection prevention measures, will help limit the transmission of MDR *A. baumannii* in COVID-19 cohort areas in critical care units. Additional studies to evaluate practical strategies to help limit transmission of MDR-pathogens in cohort-type COVID-19 critical care units are needed.

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