Presentation Type: Top Rated Posters

Epidemiologic and Microbiologic Characteristics of 28 Hospitalized Patients Cocolonized With Multiple Carbapenem-Resistant Enterobacteriaceae (CRE) in the United States

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Background: As carbapenem-resistant Enterobacteriaceae (CRE) prevalence increases in the United States, the risk of cocolonization with multiple CRE may also be increasing, with unknown clinical and epidemiological significance. In this study, we aimed to describe the epidemiologic and microbiologic characteristics of inpatients cocolonized with multiple CRE. Methods: We conducted a secondary analysis of a large, multicenter prospective cohort study evaluating risk factors for CRE transmission to healthcare personnel gown and gloves. Patients were identified between January 2016 and June 2019 from 4 states. Patients enrolled in the study had a clinical or surveillance culture positive for CRE within 7 days of enrollment. We collected and cultured samples from the following sites from each CRE-colonized patient: stool, perianal area, and skin. A modified carbapenem inactivation method (mCIM) was used to detect the presence or absence of carbapenemase(s). EDTA-modified CIM (eCIM) was used to differentiate between serine and metal-dependent carbapenemases. Results: Of the 313 CRE-colonized patients enrolled in the study, 28 (8.9%) were cocolonized with at least 2 different CRE. Additionally, 3 patients were cocolonized with ≥2 different CRE (1.0%). Of the 28 patients, 19 (67.6%) were enrolled with positive clinical cultures. Table 1 summarizes the demographic and clinical characteristics of these patients. The most frequently used antibiotic prior to positive culture was vancomycin (n = 33, 18.3%). Among the 62 isolates from 59 samples from 28 patients cocolonized patients, the most common CRE species were Klebsiella pneumoniae (n = 18, 29.0%), Escherichia coli (n = 10, 16.1%), and Enterobacter cloacae (n = 9, 14.5%). Of the 62 isolates, 38 (61.3%) were mCIM positive and 8 (12.9%) were eCIM positive. Of the 38 mCIM-positive isolates, 33 (86.8%) were KPC positive, 4 (10.5%) were NDM positive, and 1 (2.6%) was negative for both KPC and NDM. Also, 2 E. coli, 1 K. pneumoniae, and 1 E. cloacae were NDM-producing CRE. Conclusion: Cocolonization with multiple CRE occurs frequently in the acute-care setting. Characterizing patients with CRE cocolonization may be important to informing infection control practices and interventions to limit the spread of these organisms, but further study is needed.

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Epidemiology and Clinical Outcomes Associated With Extensively Drug-Resistant (XDR) Acinetobacter in US Veterans’ Affairs Health Care

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Background: Infections caused by Acinetobacter spp are often healthcare acquired, difficult to treat, and associated with high mortality. Extensively drug-resistant (XDR) Acinetobacter are nonsusceptible to at least 1 agent in all but 2 or fewer antimicrobial classes. Epidemiologic and outcome data for XDR Acinetobacter are limited and have largely been reported outside the United States. This national cohort study describes epidemiology, clinical characteristics, and outcomes for patients with XDR Acinetobacter in VA health care. Methods: This was a retrospective cohort study including microbiology and clinical data from all patients hospitalized between 2012 and 2018 at any VA medical center who had cultures that grew XDR Acinetobacter spp. Performance and reporting of bacterial speciation and antibiotic susceptibility testing were performed by each VA laboratory according to their protocol. Descriptive statistics were used to summarize data. Results: Of 11,541 unique patients with 15,358 cultures that grew Acinetobacter spp during the study period, 410 (3.6%) patients had 670 (4.4%) cultures that grew XDR Acinetobacter. Mean age was 68 years (SD, 12.2 years) and the median Charlson comorbidity index was 3 (IQR, 1–5). The greatest proportion of isolates were from the respiratory tract (n = 235, 35%) followed by urine (n = 235, 35%); almost all patients were seen at urban VA medical centers (n = 406, 99%). Most patients (n = 335, 82%) had had antibiotic exposure in the prior 90 days, most commonly vancomycin (n = 238, 65%) and third- or fourth-generation cephalosporins (n = 155, 38%). Most patients (n = 334, 81%) also had a hospital or long-term care admission in the prior 90 days. Fig. 1 shows antibiotic susceptibilities of XDR Acinetobacter isolates; polymyxins, tigecycline, and minocycline...
demonstrated the highest susceptibility. In-hospital mortality occurred in 90 patients (22%), 30-day mortality in 97 patients (24%), and 1-year mortality in 198 patients (48%). Of 93 patients, 23% were readmitted to the hospital within 90 days.

Conclusions: Providers should maintain a heightened suspicion for infection with XDR Acinetobacter spp in older patients seen at urban medical centers who have had recent healthcare and antibiotic exposures, particularly if they have respiratory or urinary tract infections. Isolation of XDR Acinetobacter is associated with high in-hospital and 30-day mortality. New antibiotics targeting MDR gram-negative bacteria generally lack activity against Acinetobacter, leaving polymyxins, tigecycline, and minocycline as the only limited treatment options. Therefore, novel antibiotics for XDR Acinetobacter are urgently needed.

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