Disclosures. All authors: No reported disclosures.

494. Fitness Cost of mcr-1-Mediated Colistin Resistance in Carbapenemase-Producing Klebsiella pneumoniae
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Background. The emergence of mobile colistin resistance gene mcr-1, a plasmid-borne polymyxin resistance mechanism, in carbapenem-resistant Klebsiella pneumoniae is an alarming concern. However, previous studies showed that the acquisition of mcr-1 was associated with a significant biological fitness cost in K. pneumoniae. We aimed to study the impact of mcr-1 on the biological fitness in clinical carbapenemase-producing K. pneumoniae strains.

Methods. Clinical carbapenemase-producing K. pneumoniae strains were collected consecutively at the Taipei Veterans General Hospital between November 2017 and December 2018. The strain positive for mcr-1 was subjected to whole-genome sequencing to delineate its genomeic features. Escherichia coli J53 strain was used as the recipient strain in plasmid conjugation assay and the transconjugants were selected with sodium azide and colistin. Plasmid stability was tested by serial passaging in antibiotic-free LB broth for 28 days. The growth rate was compared between the parental mcr-1-bearing strain and the plasmid-cured strain.

Results. One ST11 strain isolated from a fatal case with bacteremia (KP2509) was found to harbor blaKPC-2, blaOXA-48, and mcr-1. This strain was resistant to colistin (>16 mg/L) and imipenem (MIC=216 mg/L). Whole genome sequencing of KP2509 showed that mcr-1, blaKPC-2, and blaOXA-48 were located on an IncHI-FIB type plasmid of 319 kb, an IncFFI type plasmid of 96 kb, and an IncN type plasmid of 64 kb, respectively. Conjugation efficiency of mcr-1-bearing plasmid was 2.24 ± 10⁻⁴, and the colistin MIC of E. coli K53 was used as the recipient strain with sodium azide and colistin. Plasmid stability was tested by serial passaging in antibiotic-free LB broth for 28 days. The growth rate was compared between the parental mcr-1-bearing strain and the plasmid-cured strain.

Conclusion. We identified an ST11 K. pneumoniae strain carrying mcr-1, blakPC-2, and blaoXA-48, and mcr-1 genes causing a fatal bacteremia. The large mcr-1-bearing plasmid conferred a moderate level of colistin resistance but without significant biological fitness cost in carbapenemase-producing K. pneumoniae, which could result in a serious threat clinically.

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495. Risk Factors of Carbapenem-Resistant Enterobacteriaceae (CRE) Infections Among Intensive Care Unit (ICU) Patients in a Tertiary Hospital in the Philippines
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Background. The threat of Carbapenem-Resistant Enterobacteriaceae (CRE) is increasing worldwide, and the epidemiology, risk factors, and outcomes of CRE in the Philippines is unknown.

Methods. We performed a retrospective case–control study of 128 CRE cases and Carbapenem-Susceptible Enterobacteriaceae (CSE) controls matched 1:1 based on site of infection and date of admission among all adult patients in the Intensive Care Unit (ICU) between January 2014 and May 2016 at The Medical City. Predictors of CRE infection among matched cases and controls were determined through multiple conditional logistic regression analysis. In-hospital mortality was analyzed using z-test of two proportions and length of stay among patients with CRE and CSE were compared.

Results. The mean age in both groups was similar at 65.8 (range 23–92) and 64.9 (range 23–98) years, respectively. There were more males among cases than controls (76.1% vs. 59.9%); those with CRE were more likely to have a co-morbid illness and an invasive device. Pneumonia was the most common site of CRE infection (40%) followed by the urinary tract (27%). Enterobacter cloacae (54.68%) was the most common organism, followed by Klebsiella pneumoniae (30.46%). On univariate analysis, the use of piperacillin–tazobactam, third or fourth-generation cephalosporins and carbapenems, mechanical ventilation, and acute kidney injury (AKI) increased the risk of developing CRE infections by an OR of 7.5 (CI 1.88–29.95, P = 0.004), 9.2 (CI 1.48–58.59, P = 0.017), and 10.76 (CI 1.69–68.53, P = 0.012), respectively. Those with CRE had a higher in-hospital mortality than the CSE group [(49/79, 38.3%) vs. (33/95, 25.8%); P = 0.032]. Length of hospital stay among CRE cases was also longer with a mean of 43.9 vs. 28 days.

Conclusion. In our cohort, older patients w/ comorbidities developed CRE with pneumonia being the most common site of infection. Prior use of broad-spectrum antimicrobials, mechanical ventilation and AKI appeared to increase the risk of CRE infection in the ICU. CRE infection also increased patient mortality and length of hospital stay. Interventions that target these risk factors should be undertaken to help prevent CRE infection.

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was the most common non-KPC (n = 30) followed by OXA (n = 28). The proportion of CRE with no genotypic marker increased over the course of the study. Case characteristics were obtained from 41 non-KPC CP CRE cases; median age was 66 years (range: 6-94 years); 12 (29%) expired. Among the 41 cases, 20 (49%) had a central line; 11 (27%) had surgery; 14 (34%) had antibiotics in the 6 months prior to culture date. Of the 41 cases, 11 (27%) had international healthcare exposure within 12 months with an invasive procedure and/or antibiotics.

Conclusion. Surveillance in a large urban setting suggests the molecular epidemiology of CRE is changing, with declining prevalence of KPC, increasing metallo-β-lactamase CP, and large proportion of isolates without resistance markers detected. Given the worrisome trends in non-KPC CRE, more systematic surveillance is warranted, potentially using more robust molecular epidemiology.

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498. High Burden of CRO Colonization and Its Association with Infection Among Patients transferred to a Tertiary Care Hospital in India

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Background. Infections with carbapenem-resistant organisms (CRO) are increasing worldwide and are associated with high mortality. Patients transferred from outside hospitals have been reported to be at increased risk of CRO colonization and infection. The rate of subsequent CRO infection in patients colonized with CRO is uncertain.

Methods. Medanta Hospital in Gurgaon, India instituted CRO colonization screening for patients transferred from outside hospitals for infection control purposes. From April 2018 to May 2018, patients transferred from other hospitals to the intensive care unit at Medanta were subjected to CRO colonization screening using Xpert Carba R (Cepheid) performed on the day of transfer. Subsequent recovery of CRO in cultures of blood, bronchoalveolar lavage fluid, urine in specimens with pyuria obtained from patients without urinary catheters, pus, and tissue were considered to be indicative of CRO infection. The association of CRO colonization with subsequent CRO infection was assessed with a Fisher exact test.

Results. Among 457 patients screened, 205 patients (45%) were found to be colonized with CRO at admission. Genes for New Delhi Metallo-β-lactamase (NDM) were detected in 184 (40%) patients, OXA-48 in 97 (21%) patients, VIM in 18 (4%) patients, KPC in 5 (1%) patients, and IMP1 in 5 (1%) patients; >1 carbapenemase gene was detected in 184 (40%) patients, OXA-48 in 97 (21%) patients, VIM in 18 (4%) patients, KPC in 5 (1%) patients, and IMP1 in 5 (1%) patients;

Conclusion. CRO colonization was found in almost half of patients transferred from outside hospitals to a large tertiary care hospital in India and was associated with subsequent CRO infection. Further work is necessary to understand the role of CRO colonization screening in infection control and antimicrobial stewardship in a setting with high CRO burden.

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499. Carbapenem-resistant Enterobacteriaceae (CRE)-associated Infections and Prolonged Colonization among Hospitalized Patients Colonized by CRE

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Background. This study aims to determine rates of subsequent carbapenem-resistant Enterobacteriaceae (CRE)-associated infections and prolonged colonization among patients colonized by CRE and to identify risk factors of such conditions.

Methods. This study was conducted among a cohort of hospitalized adult patients colonized by CRE at an academic site from June 1, 2015 to December 31, 2018. The patients had been prospectively identified by the Infection Control (IC) Division of a Thai tertiary-care hospital. According to the hospital’s IC protocol, patients with CRE colonization/infections were isolated and underwent CRE cultured at the colonized/infection site every week until the cultures have turned negative for 2 consecutive times. Prolonged colonization was defined as having CRE colonization more than 30 days.

Results. Of the 125 patients identified, 25 were excluded due to death, being transferred, or discharged within 48 hours of CRE colonization detected. The final