513. Transmission of Carbapenem-Resistant Enterobacteriaceae in a Community-Based, Residential Care Setting: Nevada, 2018

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Background. Klebsiella pneumoniae carbapenemase-producing organisms (KPCs) are often multidrug-resistant, and the KPC resistance determinant can be transmitted between bacteria. KPCs are associated with healthcare facility exposures; identification in community-based, residential care settings is uncommon. In September 2018, the Washoe County Health District was notified of a KPC producing Escherichia coli from a group home (GH) resident. We investigated the source of this KPCO and evaluated transmission in the GH.

Methods. A case was defined as detection of KPCO from a GH resident or staff from June 1 to November 30, 2018. Staff included caregivers who provided daily care (including toileting, bathing, feeding) and visiting healthcare workers. Residents and staff were offered KPCO screening to assess colonization status. Exposures were assessed by medical record review and interviews. Genetic relatedness of KPCOs was evaluated by whole-genome sequencing (WGS). Infection prevention and control (IPC) practices were reviewed.

Results. Overall, six cases were identified, including the index, two of seven staff, and three of six residents screened. Three residents with KPCO had recent hospitalizations and shared a bathroom in the GH; one overlapped on the same hospital unit as a patient with KPC-producing Klebsiella oxytoca. Staff with KPCO were caregivers who had extensive contact with residents and their environment and no IPC training. Gaps in hand hygiene and environmental cleaning were observed. Organism was recovered from 4 positive screening tests as well as from blood cultures from the index case; all were KPC-producing E. coli. WGS showed that the five E. coli isolates were closely related, consistent with transmission, and harbored the same KPC variant as the K. oxytoca. No new cases occurred after IPC was improved.

Conclusion. A GH resident likely acquired KPCO during a recent hospitalization, and extensive transmission among GH residents and staff occurred. Factors contributing to transmission included resident dependence on caregivers for daily care and minimal IPC knowledge among caregivers. Facilities with similar populations should increase IPC training to prevent transmission of resistant pathogens.

514. Shedding of Multidrug-Resistant Gram-Negative Bacilli by Colonized Patients During Procedures and Patient Care Activities

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Background. Contaminated environmental surfaces contribute to transmission of healthcare-associated pathogens such as multidrug-resistant gram-negative bacilli. We hypothesized that medical procedures and patient care activities facilitate environmental dissemination of multidrug-resistant gram-negative bacilli in hospitalized patients.

Methods. We conducted a cohort study of hospitalized patients in contact precautions for carriage of extended spectrum β-lactamase (ESBL)-producing or carbapenem-resistant gram-negative bacilli (CR-GNB) to determine the frequency of environmental shedding during procedures and care activities. Perirectal, wound, and skin were cultured for the gram-negative bacilli of interest. Prior to each procedure or activity, surfaces in the room and portable equipment used for procedures were disinfected. After procedures, high-touch surfaces and portable equipment were cultured; negative cultures were collected after 1 hour in the absence of a procedure.

Results. Of 60 participants, 38 (63%) were in contact precautions for ESBL-producing or CR-GNB. Thirty-four (57%) participants had positive perirectal, wound, or skin cultures. Contamination of surfaces with the colonizing multidrug-resistant gram-negative bacilli occurred frequently during procedures and activities such as wound care, assistance with meals, and urinary catheter or colostomy care (11% to 29% of procedures/activities), whereas contamination was rare in the absence of a procedure (1%). Contamination was recovered from 6 of 56 (10%) portable devices used for procedures.

Conclusion. Environmental shedding of multidrug-resistant gram-negative bacilli occurs frequently during medical and non-medical procedures in hospitalized patients. Our results suggest that there is a need for effective strategies to disinfect surfaces and equipment after procedures.

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