Torok, Estee; Brodrick, Hayley; Khokhar, Fahad; Blane, Beth; Polgarova, Petra; Brown, Joanne; Enoch, David; Brown, Nicholas; Summers, Charlotte; Preller, Jacobus; +4 more... Thomson, Nick; Dougan, Gordon; Parkhill, Julian; Peacock, Sharon; (2017) Prospective Surveillance and Rapid Whole-Genome Sequencing Detects Two Unsuspected Outbreaks of Carbapenemase-Producing Klebsiella pneumoniae in a UK Teaching Hospital. Open Forum Infectious Diseases, 4 (Suppl). S43-S44. ISSN 2328-8957 DOI: https://doi.org/10.1093/ofid/ofx162.104

Downloaded from: http://researchonline.lshtm.ac.uk/4650934/

DOI: https://doi.org/10.1093/ofid/ofx162.104

Usage Guidelines:

Please refer to usage guidelines at http://researchonline.lshtm.ac.uk/policies.html or alternatively contact researchonline@lshtm.ac.uk.

Available under license: http://creativecommons.org/licenses/by-nc-nd/2.5/
UK, 1John Farman Intensive Care Unit, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK; 2Department of Infectious Diseases, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK; 3Clinical Microbiology and Public Health Laboratory, Public Health England, Cambridge, UK; 4Department of Microbiology, Public Health England, Cambridge, UK; 5Wellcome Trust Sanger Institute, Cambridge, UK; 6London School of Hygiene and Tropical Medicine, London, UK

Session: 190. Resist! MDROs in Healthcare
Friday, October 6, 2017: 2:00 PM

Background. The increasing incidence of carbapenemase-producing Enterobacteriaceae (CPE) is a global health concern, as treatment options are extremely limited. The prevalence of CPE in UK hospitals is unknown, as national screening guidelines only recommend screening in patients considered to be at high-risk of CPE. Patients in intensive care units (ICU) are at high-risk of healthcare-associated infections caused by multidrug-resistant organisms (MDRO).

Methods. We conducted a six-month prospective surveillance study to determine the prevalence of MDRO in a UK teaching hospital ICU. Between June and December 2016, all adult patients admitted to ICU were screened for MDRO on admission, on discharge, and weekly during their ICU stay. Surveillance samples included stool or rectal swabs, urine, sputum or tracheal aspirates, and wound swabs (if wounds were present). Isolates were characterized phenotypically before undergoing whole-genome sequencing (WGS), epidemiological, and phylogenetic analyses.

Results. During the first week of the study we identified stool carriage of a multidrug-resistant Klebsiella pneumoniae strain in two patients neither of whom had recognized risk factors for CPE. Both isolates were resistant to all antibiotics tested, apart from colistin, and were PCR-positive for the blaKPC gene. Enhanced surveillance by the infection control team identified four additional patients in several wards who had stool carriage (n = 3) or bloodstream infection (n = 1) with a blaKPC K. pneumoniae isolate. Epidemiological links were identified between these six patients. Five months later, a second outbreak of multidrug-resistant K. pneumoniae was detected, involving stool carriage by four patients on two different wards. Environmental screening identified environmental contamination with multidrug-resistant K. pneumoniae on one ward. DNA sequence analysis confirmed that a novel blaKPC K. pneumoniae lineage (ST78) was responsible for both outbreaks in the hospital.

Conclusion. We identified two unsuspected multidrug-resistant outbreaks in patients with no recognized risk factors for CPE. This highlights the importance of prospective surveillance for MDRO in high-risk settings, such as ICUs, and supports the use of rapid WGS to support outbreak investigations in real-time.

Disclosures. All authors: No reported disclosures.

1699. Prevalence and Acquisition of MRSA During Incarceration at a Large Inner-City Jail
Kyle J Popovich, MD MS FIDSA1,2; Chad Zawitz, MD3; Alla Aroucheva, MD, PhD2,4; Darjai Payne, BS, MPH; Michael Schoeny, PhD5; Emma Richardson, BS6; Mary K. Hayden, MD, FIDSA, FSHEA7; Bala Hota, MD, MPH8; Robert A. Weinstein, MD, FIDSA, FSHEA, FACP9,10; Rush University Medical Center, Chicago, Illinois; 1Stroger Hospital of Cook County, Chicago, Illinois

Session: 190. Resist! MDROs in Healthcare
Friday, October 6, 2017: 2:00 PM

Background. USA300 MRSA is endemic in certain communities, with congregate settings such as urban jails potentially facilitating spread. The extent of MRSA transmission in jail is unclear, a controversy that impacts prevention strategies. We determined the prevalence of MRSA colonization at jail entrance and defined the acquisition rate during incarceration.

Methods. Men incarcerated at the Cook County Jail, one of the largest US single-site jails, were enrolled within 72 hours of intake. Surveillance cultures (nares, throat, groin) were collected to determine prevalence of MRSA colonization. A survey was administered to identify predictors of colonization. Detainees still in jail at Day30 had cultures repeated to determine MRSA acquisition rate. Univariate and multivariate analysis was performed to identify predictors of MRSA colonization.

Results. A total of 402 men (447 unique incarcerations) have so far been enrolled (77% AA, 11% Hispanic) with 92% previously in jail (20% in past 6 months). The prevalence of MRSA colonization at intake was 18.6% (83/447), with 39% of those colonized solely in the throat or groin. At 30 days: 10% (9/92) of initially negative men acquired MRSA; 14 admission positives remained colonized while 11 lost colonization. On univariate (Table), predictors of MRSA colonization at entrance to the jail were: methamphetamine use (METH), unstable housing, current skin infection, and care at an outpatient Clinic A that emphasizes comprehensive care to the LGBTQ community. In this cohort, METH use was associated with reporting being a man who has sex with men vs. not (35% vs. 9%, P < 0.001) and was common among men with care at Clinic A (18% vs. 3%, P < 0.001). On multivariate with adjustment for race/ethnicity and HIV status, current skin infection and care at clinic A were associated with MRSA. Unanimously, sharing personal items was associated with MRSA acquisition at Day30 (OR = 5.6, 95% CI, 1.3, 23.3, P = 0.02).

Conclusion. We found that a relatively high proportion of individuals enter the jail colonized with MRSA and the jail may amplify rates. Entrance colonization risk factors point to possible community reservoirs. Enrollment is ongoing but results suggest an intervention in jail could impact MRSA rates in the jail and in the surrounding community.

Disclosures. All authors: No reported disclosures.