533. Impact of Different Definitions on Reported Rates of Carbapenem-Resistant *Enterobacteriaceae* (CRE)

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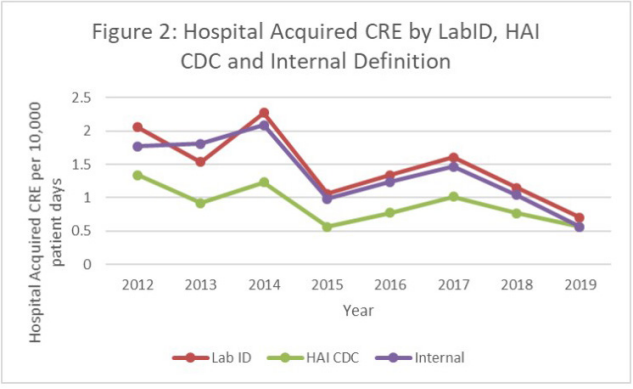
Background. Different definitions exist for tracking and trending rates of hospital-acquired Carbapenem-resistant Enterobacteriaceae (CRE). National Health Safety Network (NHSN) allows for Laboratory Identified Event (LabID) and Healthcare-associated infection (HAI) surveillance reporting for CRE. Our facility developed an internal definition for CRE prior to release of the NHSN modules that differs from the CDC definitions in that patients colonized or infected with CRE identified on hospital day 1 or 2 who had a hospitalization within the past four weeks are considered community-onset healthcare facility acquired (COHCFA) and are included in our HA definition. In addition, by our definition once a patient develops CRE any subsequent positive cultures for the same organism are not considered new events.

Methods. All CRE cultures at our facility were reviewed by an infection preventionist and hospital epidemiologist who categorized each culture as hospital acquired by our internal HA definition, NHSN LabID definition and NHSN HAI definition. Results from each method of surveillance were compiled and compared as were trends of HA CRE over time by each definition.

Results. 590 patients with 975 clinical cultures for Carbapenem-resistant *Klebsiella* spp., Enterobacter spp and *E. coli* were reviewed from January 2012 to March 2019. 297 cultures met our internal definition for HA CRE compared with 302 by NHSN LabID and 189 by NHSN HAI surveillance. Sixty-one (21%) of HA cases by our definition were COHCFA. 259 patients had multiple CRE cultures and 1 patient had 22 cultures with the same CRE organism between 2014 and 2019 and met for 5 lab ID events and 5 NHSN HAI events. All 3 tests agreed that a culture was HA in 140 instances (14%) and all 3 agreed that a culture was not HA in 589 instances (60%). At least one definition yielded a discordant result in 246 cultures (25%). Trends over time were compared between the definitions. While the number of HA cases varied based on the definition used, overall trends over time were similar regardless of the definition utilized. (Figure 2)

Conclusion. Regardless of the definition used for surveillance of CRE, trends over time are similar. Consideration should be given to monitoring COHCFA cases in addition to those acquired on or after hospital day 3.



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534. Active Screening for Carbapenemase Producing *Enterobacteriaceae*: Yield and Cost Considerations

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Background. During 2016, our hospital experienced an outbreak with carbapenemase-producing *Enterobacteriaceae* (CPE) in our solid-organ transplant (SOT) population. Since this outbreak and until now, our hospital has implemented active CPE screening of patients admitted to SOT units and point prevalence surveillances in any unit with a known CPE patient. The present study evaluates the yield of these screening tests and their cost since implementation.

Methods. This retrospective cohort was performed in a 600-bed hospital in Milwaukee, WI. CPE screening tests were retrieved from the clinical microbiology laboratory dataset from January 2016 to April 2019. CPE tests are performed on rectal swabs or stool samples using the CDC broth enrichment method followed by MIC confirmation using Etest. CPE patients were placed on enhanced precautions (gowns, gloves, booties) and were cohorted geographically and to 1:1 nursing and nurse aid staff.

Results. A total of 6,684 samples belonging to 3,383 patients were processed (1.9 samples/patient). Two hundred thirty (3.44%) had carbapenem-resistant *Enterobacteriaceae*, although only 33 isolates (0.49%) were confirmed as either KPC (n = 31) or NDM (n = 2) positive. Out of the 3,383 patients tested, 121 were identified as carriers of carbapenem-resistant isolates but only 11 (0.32%) were CPE (KPC = 11; NDM = 2). The incidence of new CPE patients during 2016 was 0.82% but decreased to 0.28% and 0.33% in 2017 and 2018, respectively. The units with the highest number of CPE patients were the transplant intensive care unit (n = 6) and the step-down SOT unit (n = 3). Negative cultures were quoted at $8.49 per sample but culture plates with colonies increased the cost per test to $28.44. The total cost for all the 6,684 screening tests was calculated at $61,335. The cost of CPE screening per positive CPE patient identified comes up to $5,575 (not including RN collection time).

Conclusion. In an institution with staff and CPE patient cohorting, active screening of CPE positive patients was relatively expensive given our low -level of transmission. In the near future, we plan to stop staff and patient cohorting due to the high stress that these interventions place on our hospital staff. This might ensue in increase transmission, which will be detected by CPE screening tests.

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535. Multicenter Study of the Prevalence of Rectal Colonization by Carbapenem-Resistant Enterobacteriaceae in Patients Admitted to the Intensive Care Units of 7 Major Hospitals in Kuwait

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Background. The emergence of carbapenem-resistant Enterobacteriaceae (CRE) has become an important epidemiological change in infectious diseases in the last 10 years. The gut is an important reservoir for these isolates thereby creating an opportunity for dissemination in a hospital setting especially the intensive care units (ICUs). The objective of this study was to investigate the colonization rates of patients, by CRE, admitted to the ICUs of 7 teaching hospitals.

Methods. Rectal swabs were collected during July 2017 to November 2018 from all patients on the day of ICU admission and 1 week after in each hospital. The samples were screened by direct plating on MacConkey agar containing 10-µg meropenem. Bacterial species identification was performed using the VITEK-2 system. The minimum inhibitory concentrations (MICs) of 14 antibiotics were determined by using Etest. Genes encoding carbapenem resistance was detected by PCR and sequencing. Their clonal relationship was determined by pulsed-field gel electrophoresis (PFGE).

Results. A total of 2580 Enterobacteriaceae were isolated from all patients. Seventy-four (2.9%) were confirmed as CRE most of which were from patients in Adan (AH: 36.5%) and Mubarak (MH: 46%) hospitals. Sixty (81.1%) harbored one or more of the tested carbapenemases genes. Forty-six (62.2%) carried $bla_{\text{OXA-181}}$, 9 (12.2%) $bla_{\text{OXA-48}}$, one $bla_{\text{KPC-2}}$, while 14 (18.9%) carried 2 genes. Combinations of $bla_{\text{KPC-2}}$ and $bla_{\text{OXA-181}}$ genes were found in 5 (6.8%), $bla_{\text{VIM-1}}$ and $bla_{\text{OXA-181}}$ in 4 (5.4%), $bla_{\text{NDM-5}}$ and $bla_{\text{OXA-181}}$ in 3 (4.1%) and $bla_{\text{NDM-1}}$ and $bla_{\text{OXA-181}}$ in 2 (3.3%). The *Xba*I PFGE profile-based Dendrogram, at 85% similarity criterion, resolved 7 pulsotypes among isolates carrying $bla_{\text{OXA-181}}$ in AH and MH designated A, B, C, D, E, F, and G. Further analysis revealed that 7 subpulsotypes A1, A2, A5, A6, C1, C2, and E1 were from unit D in the medical ICU of MH and A3, A4, B1, B3, D1, D2, D3, D4, F1, F2, F3, G1, and G2 were from surgical/medical ICUs in AH. 100% similarity was demonstrated among 8 isolates from AH and 2 from MH.

Conclusion. The prevalence of rectal colonization by CRE in the ICU patients was lower than expected. Detection of $bla_{\text{OXA-181}}$ variety and $bla_{\text{NDM-5}}$ is new to the milieu of genes so far described in isolates from Kuwait.

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536. Challenges in Using MALDI-TOF Technology to Assess for KPC Resistance in *Klebsiella pneumoniae* isolates in America

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Background. The emergence of *Klebsiella pneumoniae* Carbapenemase-producing Enterobacteriaceae (KPC-E) has created a major public health concern. In clinical practice, rapid identification of KPC-KP has important implications for clinical management and infection control. In some settings matrix-assisted laser desorption ionization time of flight (MALDI-TOF) software has been used for rapid detection of KPC producing *K. pneumoniae* with high sensitivity and specificity. Genomic sequencing has determined that the 11.09 m/z peak is related to protein expression from the P109 gene found mostly in Tna4401a isoform among KPC-E. In our study, we evaluated the use of MALDI-TOF automated detection software to evaluate for KPC detection among a diverse group of KPC-E isolates.