2018

470. Concomitant Antibiotic Use and Death Among a National Cohort of Veterans With Clostridium difficile Infection (CDI)

Haley Appaneal
Aisling R. Caffrey
Kerry L. LaPlante

Follow this and additional works at: https://digitalcommons.uri.edu/php_facpubs
and after CDI events. The CDPH HAI Program is using these analyses to inform CDI prevention outreach to California healthcare facilities and provider networks.

Disclosures. All authors: No reported disclosures.

467. Investigation of a Clostridium difficile Infection (CDI) Outbreak in a Community Teaching Hospital

Laura Parker, BA, Sharon Parrilo, BSN, RN, CIC1 and Ronald Nahass, MD, FIDSA, FISPEA, FIDSA; Rutgers Robert Wood Johnson Medical School, Piscataway Township, New Jersey, 1Robert Wood Johnson University Hospital, Somerville, New Jersey and 1DID Care, Inc., Hillsborough, New Jersey

Session: 59. Healthcare Epidemiology: Updates in C. difficile Thursday, October 4, 2018: 12:30 PM

Background. An abrupt change in baseline CDI from 2016 to 2017 prompted a response team task force including senior administration, the CMIO, infection prevention, environmental services, laboratory, pharmacy, emergency department (ED), and nursing to address the problem.

Methods. Hospital-acquired (HA) and community-acquired (CA) CDI cases were tracked using an epidemic curve and institutional case mapping. A multipronged intervention was implemented that included molecular typing of isolates, quarterly terminal cleaning of the ED, improved CDI screening and testing, intensified antimicrobial stewardship (AS) with mandatory education for key clinicians, and rigorously enhanced enforcement of hand hygiene with secret observers and directed feedback. Pre-, mid-, and fully-implemented intervention HA and CA CDI rates were observed.

Results. Ninety-five percent of CA CDI and 98% of all patients who developed HA CDI were admitted through the ED. Cases of CDI were distributed throughout the hospital. The genotyping did not identify a single strain outbreak. Sixteen percent of all CDI samples (23% of CA and 9% of HA cases) sent to the DOH tested positive for BINA1. Preintervention rates of HA CDI were found to be lower than mid-intervention rates (2.4, 95% CI= 1.5–3.1 vs. 4.3, 95% CI= 1.13–7.37). HA CDI rates after intervention was implemented that included molecular typing of isolates, quarterly terminal cleaning of the ED, improved CDI screening and testing, intensified antimicrobial stewardship (AS) with mandatory education for key clinicians, and rigorously enhanced enforcement of hand hygiene with secret observers and directed feedback. Pre-, mid-, and fully-implemented intervention HA and CA CDI rates were observed.

Conclusion. The objectives of this study were to characterize cases of CA-CDI and investigate the potential causes of this increase. A retrospective study was carried out using a survey sent to eligible healthcare institutions. Hospitals participating in QCISP that reported ≥3 cases of CA-CDI in 2016–2017 were invited to participate. To identify potential causes of the apparent increase in CA-CDI incidence, they were asked to provide clinical information regarding up to three cases of CA-CDI for two distinct surveillance years (2011–2012 and 2016–2017). To characterize each CA-CDI cases, a broad range of demographic, clinical, and laboratory variables were collected, including medical history, a broad range of contact with primary and secondary healthcare institutions, previous antibiotics use as well as laboratory diagnostic test. A X2 test have been used to test year differences in indicator distributions.

Results. A total of 49 healthcare institutions provided data on 172 cases of CA-CDI. Overall, 92% (n = 159) of them meet the QCISP CA-CDI criteria definition. Among them, 95% patients (66%) were female and average age was 66.2 ± 15.7 years old. Seventy-four percent had received antibiotic in the previous year. Between the two years, there was no significant change in the socio-demographic and clinical variables of CA-CDI cases. The proportion of patients receiving immunosuppressive drugs and proton pump inhibitors at the time of diagnosis was 11% and 45%, respectively. The proportion of cases visiting ambulatory healthcare settings during the year previous to patient admission increased from 61% (2011–2012) to 69% (2016–2017) (P = 0.18). Moreover, there was a significant increase in the proportion of CA-CDI diagnosed by laboratory PCR test (from 8% to 55%; P < 0.0001).

Conclusion. We present a retrospective study to characterize CA-CDI using the QCISP. The increase in the use of PCR is associated with the incidence of CA-CDI but may not be the cause of it.

Disclosures. Y. Longtin, Merck: Grant Investigator, Research grant. Becton Dickinson: Grant Investigator, Grant recipient.

470. Combinant Antibiotic Use and Death Among a National Cohort of Veterans With Clostridium difficile Infection (CDI)

Haley Appenae, PharmD2; Aisling Caflrey, PhD, MS2; and Kerry LaPlante, PharmD, FCPP, FIDSA2; Rhode Island Infections Diseases Research Program, Providence, Veterans Affairs Medical Center, Providence, Rhode Island, 1College of Pharmacy, University of Rhode Island, Kingston, Rhode Island

Session: 59. Healthcare Epidemiology: Updates in C. difficile Thursday, October 4, 2018: 12:30 PM

Background. Antibiotic use is a well-known risk factor for development of CDI, and there is preliminary evidence suggesting concomitant antibiotic use may result in poor outcomes, including death. This work investigated the effect of concomitant antiinfective exposure during CDI treatment on mortality among patients with CDI.
Methods. We conducted a national retrospective study of Veterans with a first CDI between 2010 and 2014, defined as a positive C. difficile toxin(s) and no episode ≥ 24-hour period) and antimicrobial exposure within the past 30 days. Hospital envir

Stool samples were collected from hospitalized adults with diarrhea (≤ 3 loose stools in a 24-hour period) and antimicrobial exposure within the past 30 days. The estimated prevalence of CDI in Bangladesh is unknown. We aimed to assess the prevalence of CDI and assess hospital environmental contamination of tox

Methods. This was a prospective observational cohort study at two large tertiary care centers in Dhaka, Bangladesh, conducted from January 2017 to December 2017. Stool samples were collected from hospitalized adults with diarrhea (≥ 2 loose stools in a 24-hour period) and antimicrobial exposure within the past 30 days. Hospital envir

Table 1: Demographic Data for All Stool Samples

| Variable                      | Toxicologic negative (n = 22) | Toxicologic positive (n = 41) | P     |
|-------------------------------|-------------------------------|-----------------------------|-------|
| Age                           | 52.8% (n = 10)                | 98.0% (n = 40)              | 0.001 |
| Gender                        | 52.8% (n = 10)                | 98.0% (n = 40)              | 0.001 |
| Race                          | 52.8% (n = 10)                | 98.0% (n = 40)              | 0.001 |

472. Prevalence, Risk Factors, and Outcome of Postoperative Clostridium difficile Infection After Orthopedic Surgery

Dong Youn Kim, MD; Yu-Mi Lee, MD; Young Jin Kim, MD; Misk Lee, MD; Hee-Joo Lee, MD; and Ki-Ho Park, MD. Division of Infectious Diseases, Department of Internal Medicine, Kyung Hee University Hospital, Kyung Hee University School of Medicine, Seoul, Korea, Republic of (South). Department of Laboratory Medicine, Kyung Hee University Hospital, Kyung Hee University School of Medicine, Seoul, Republic of (South)

Session: 59. Healthcare Epidemiology: Updates in C. difficile
Thursday, October 4, 2018: 12:30 PM

Background. The patients undergoing orthopedic surgery may have many risk factors of Clostridium difficile infection (CDI), including increased age, multiple comorbidities, the use of cesarean section, and prolonged length of stay. The aim of this study was to identify prevalence, risk factor, and outcome of postoperative CDI in patients who underwent orthopedic surgery.

Methods. We performed a retrospective cohort study including all patients aged 18 years who underwent orthopedic surgery from January 2016 through December 2017 in a tertiary care hospital in Seoul, South Korea.

Results. During the study period, 7,369 episodes of orthopedic surgery were identified. The prevalence of C. difficile infection was 7.7 cases per 1,000 surgical procedures (95% confidence interval, 6.0–10.0). The risk of CDI was the highest among patients who underwent spine surgery (33.8 cases per 1,000 surgical procedures), followed by hip/femur surgery (12.4, knee (3.8), and extremity (3.2). The risk of CDI increased according to the increase in duration of proton pump inhibitor: 0.1% (no use), 0.3% (1–7 days), and 2.7% (>7 days, P < 0.001). The independent risk factors associated with postoperative CDI were age (>64 years, 1.87; P < 0.001), duration of surgery (HR 1.03; P < 0.001), Charlson morbidity index score (OR per 1-point increase, 1.26; P < 0.001), duration of proton pump inhibitor (OR per 1-day increase, 1.02; P < 0.001), and operation type (OR per 1-hour increase, 1.30; P = 0.003). Of 6,724 episodes of surgical procedure for which patients received antibacterial prophylaxis, 22 episodes of postoperative CDI occurred (3.2 cases per 1,000 surgical procedures). Among this subgroup, the risk of CDI increased according to increase in duration of antibiotic prophylaxis: 0% (<24 hour), 0.28% (1–7 days), and 1.27 (>7 days, P < 0.001). After adjusting confounding factors, duration of antibiotic prophylaxis was a significant risk factor for postoperative CDI (OR per 1-day increase, 1.11; P < 0.001). Patients with CDI had a higher rate of postoperative mortality (10.5% vs. 0.6%; P < 0.001) and an increased length of hospital stay (mean 42 vs. 10 days, P < 0.001).

Conclusion. Judicious use of preoperative antibiotics and avoiding of extension of prophylactic antibiotics can reduce postoperative CDI after orthopedic surgery.

Disclosures. All authors: No reported disclosures.

473. Molecular Typing of Clostridium difficile: Concordance Between PCR-Ribotyping and Multilocus Sequence Typing (MLST)

Xiong Wang, DVM, PhD; Stacy Holzhauer, DVM, MPH; Kelly Pung, BS; Marra Bye, MPH; Michelle Adameczyk, BS; Ashley Lynn Paulick, BS; Nicholas Vlachos, MS; Alice Guh, MD, MPH; Alison S. Lauter-Halpin, PhD; Maria S. Karlsson, PhD; Dave Boxrud, MSC, and the Emerging Infections Program CDI Workgroup; Minnesota Department of Health, Saint Paul, Minnesota, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia

Session: 59. Healthcare Epidemiology: Updates in C. difficile
Thursday, October 4, 2018: 12:30 PM

Background. Clostridium difficile infection (CDI) incidence has increased dramatically in the past decade, making CDI one of the most common causes of infectious diarrhea and an urgent public health threat. Understanding the biological features and population genetics of C. difficile strains is critical if we are to target current control efforts. PCR-ribotyping, the current method of choice for C. difficile typing, remains subjective and challenging for inter-laboratory comparisons. Multilocus sequence typing (MLST), based on the alleles of seven housekeeping genes, represents a more robust tool that would enhance interlaboratory reproducibility. However, a comprehensive translation system to ribotyping is required. Here, we describe the concordance between MLST and PCR-ribotyping.

Methods. The Centers for Disease Control and Prevention’s (CDC) Emerging Infections Program (EIP) conducts C. difficile surveillance in 10 US sites. C. difficile isolates cultured from a subset of cases underwent capillary-based PCR-ribotyping at CDC. A representative sample, selected from the top 30 ribotypes (RTs), underwent whole genome sequencing (WGS) at Minnesota Department of Health. An additional subset of isolates, representing the top 10 RTs, underwent WGS at CDC. At both laboratories, the illumina MiSeq platform was used to obtain 250 bp paired-end sequencing reads. MLST analyses were conducted using the pubMLST C. difficile MLST database.

Results. A total of 479 C. difficile isolates, including at least 10 isolates for each RT, were analyzed by WGS. Among the 30 RTs represented, 35 different MLST sequence types (STs) were identified. Twenty-two of the two of the STs (including ST27) were each associated with a single unique ST, while 8 STs (OR per 1-year increase, 1.11; P < 0.001) and 075(2) presented more genetic diversity with single-locus or double-locus variants, resulting in multiple STs within one ribotype. There were two instances of two different RTs sharing the same ST.

Conclusion. Multilocus sequence typing and PCR-Ribotyping showed comparable discriminatory abilities. However, the ST is not always predictive of the RT and vice versa. This represents the first step toward a transition to using WGS for standard C. difficile typing.

Disclosures. All authors: No reported disclosures.