ORAL ABSTRACT

76. Association of Hospital-Onset *Clostridium difficile* Infection Rates and Antibiotic Use in US Acute Care Hospitals, 2006–2012: An Ecologic Analysis

Sophia Kazakova, MD, MPH, PhD; James Baggs, PhD; Lawrence McDonald, MD; Sarah Yi, PhD; Kelly Hatfield, MSPH; Alice Guh, MD, MPH; Sujan Reddy, MD and John A. Jernigan, MD, MS; Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia

Session: 28. CDI Prevention
Thursday, October 5, 2017: 8:30 AM

Background. This study investigated the association between facility-level rates of hospital-onset CDI (HO-CDI) and inpatient antibiotic use (AU) in a large group of U.S. acute care hospitals over a 7-year period.

Methods. We used adult discharge and antibiotic use data from 552 acute care hospitals participating in the Truven Health MarketScan Hospital Database from January 1, 2006 to December 31, 2012 to determine facility-level CDI rates and AU. HO-CDI was defined as a discharge with a secondary ICD-9-CM diagnosis code for CDI (008.45) and inpatient treatment with metronidazole or oral vancomycin. The relationship between facility-level HO-CDI (HO-CDI per 10,000 patient-days (PD)) and AU (days of therapy (DOT) per 1,000 PD) was examined through multivariate general estimating equation models that accounted for the correlation between annual HO-CDI rates within a hospital. The models controlled for hospital characteristics and a facility-level rate of community-onset CDI (CO-CDI), defined as a discharge with a primary ICD-9-CM code for CDI and inpatient treatment.

Results. During 2006 to 2012, the mean HO-CDI rate was 11 per 10,000 PD (interquartile range (IQR): 5.7–14.7) and mean AU was 811 DOT/1,000 PD (IQR: 710–932). After controlling for facility-level CO-CDI and other hospital characteristics, overall AU was significantly associated with facility-level HO-CDI rate; for every 50 DOT/1,000 PD increase in AU, there was a 4.4% increase in the HO-CDI rate. Similarly, the only antibiotic classes significantly associated with HO-CDI were third- and fourth-generation cephalosporins ($P < 0.0001$) and carbapenems ($P = 0.0011$) with respective increases of 2.1% and 2.4% of HO-CDI per 10 DOT/1,000 PD increase. Fluoroquinolones and β-lactam/β-lactamase inhibitor combinations were not significantly associated with HO-CDI.

Conclusion. In this ecologic analysis of over 500 hospitals, overall antibiotic use was associated with increased rates of HO-CDI. In contrast to recent patient-level analyses in the United States and national observations in England, only third- and fourth-generation cephalosporins and carbapenems were associated with HO-CDI.

Disclosures. **All authors:** No reported disclosures.

77. *Clostridium difficile*: Investigating Transmission Patterns Between Symptomatic and Asymptomatic Patients Using Whole Genome Sequencing

Ling Yuan Kong, MD[1]; David Eyre, BM BCh DPhil MCRP FRCPath[2]; Jacques Corbeil, PhD[3]; Frederic Raymond, MSc, PhD[4]; A. Sarah Walker, PhD[5]; Mark Wilcox, MD[6]; Anne-Marie Bourgault, MD[7]; Andre Dascal, MD[8]; Sophie Michaud, MD, MPH[9]; Baldwin Toye, MD, FRCPC[10]; Vivian Loo, MD, MSc, FSHEA[1] and Consortium de recherche québécois sur le Clostridium difficile; [1]McGill University Health Centre, Montreal, QC, Canada; [2]Nuffield Department of Medicine, University of Oxford, Oxford, United Kingdom; [3]Centre de recherche CHUQ-CHUL, Sainte-Foy, QC, Canada; [4]Centre de recherche CHUQ-CHUL, Ste-Foy, QC, Canada; [5]NIHR Oxford Biomedical Research Centre, Oxford, United Kingdom; [6]Leeds Institute of Biomedical and Clinical Sciences, University of Leeds, Leeds, United Kingdom; [7]Centre Hospitalier de l'Université de Montréal, Montreal, QC, Canada; [8]Jewish General Hospital, Montreal, QC, Canada; [9]Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC, Canada; [10]Microbiology and Infectious Diseases, The Ottawa Hospital, University of Ottawa, Ottawa, ON, Canada

Session: 28. CDI Prevention
Thursday, October 5, 2017: 8:30 AM

Background. Patients with symptomatic *Clostridium difficile* infection (CDI) are thought to be responsible for most transmission events, but whole genome sequencing (WGS) studies have raised interest in asymptomatic carriers' role in transmission.

Methods. Patients with CDI and colonization were identified using weekly screening in a study conducted during 2006–2007 at six Canadian hospitals. Isolates were typed using pulsed-field gel electrophoresis (PFGE), multi-locus sequence typing (MLST), and WGS. Toxigenic status was determined using cytotoxin testing and *tcdB* PCR. Incident CDI cases, not included in the initial study, were also sequenced where possible. Ward movement and typing data were combined to identify plausible donors for each CDI case, as defined by shared time and space on the same ward within predefined limits (infectious period <8 weeks and incubation period <12 weeks), or a shared ward after diagnosis of the donor within 26 weeks of the donor's discharge. Proportions of plausible donors for CDI cases that were colonized, infected, or both were examined.

Results. A total of 554 samples were sequenced successfully, 348 from colonized, 201 from infected, and 5 from patients with unknown status. The NAP1/027/ST1 strain was most common among infected and colonized patients. Colonized patients predominantly carried toxigenic strains. Comparing samples from infected patients with all prior samples, a donor with a plausible ward link was found for 115 (57.2%) cases using PFGE, 127 (63.2%) using MLST, and 81 (40.3%) using WGS with a threshold of ≤2 single-nucleotide variants to determine relatedness. Examining data from the two hospitals with most complete data, across all typing methods, more cases could be linked to infected patients rather than to colonized patients. Using WGS, 26 (21.9%) cases were genetically linked to infected patients only, whereas 4 (3.4%) to colonized patients only, and 30 (25.2%) to both. Of those with a genetic link to an infected patient, 21 (17.7%) had a ward link, whereas this was found for only 1 (0.8%) case linked to a colonized patient.

Conclusion. Asymptomatic carriers contribute to transmission, but CDI cases are more likely linked to other infected patients than colonized patients in this cohort with high rates of NAP1/027/ST1 strain.

Disclosures. **M. Wilcox**, Merck & Co., Inc.: Consultant, Consulting fee. Cubist: Consultant, Grant Investigator and Speaker's Bureau, Consulting fee, Grant recipient and Speaker honorarium. Alere, Actelion Pharma, Astellas, Optimer, Sanofi pasteur, Summit Pharma, bioMerieux, Da Volterra, Qiagen, Cerexa, Abbott, AstraZeneca, Pfizer, Durata Therapeutics, Seres Therapeutics, Valneva, Nabriva Therapeutics, Roche, The Medicines Company, Basilea P: Consultant, Consulting fee. Alere, Actelion Pharmaceuticals, Pharmaceuticals, Astellas, Optimer Pharmaceuticals, Sanofi pasteur, Summit Pharmaceuticals, bioMerieux, Da Volterra, Qiagen, Cerexa, and Abbott: Grant Investigator, Grant recipient.

78. Antibiotic Prescribing for Dental Procedures in Community-Associated *Clostridium difficile* cases, Minnesota, 2009–2015

Maria Bye, MPH[1]; Tory Whitten, MPH[1]; Stacy Holzbauer, DVM, MPH, DACVPM[2,3]; [1]Infectious Disease Epidemiology, Prevention, and Control Division, Minnesota Department of Health, St. Paul, Minnesota; [2]Minnesota Department of Health, St. Paul, Minnesota; [3]Division of State and Local Readiness, Office of Public Health Preparedness and Response, Centers for Disease Control and Prevention, Atlanta, Georgia

Session: 28. CDI Prevention
Thursday, October 5, 2017: 8:30 AM

Background. *Clostridium difficile* infections (CDIs) are the leading cause of healthcare-associated diarrhea. Two of the most significant risk factors for CDI are antibiotic use and healthcare exposure. Dentists write approximately 10% of all outpatient prescriptions in the USA; however, limited data are available regarding dental prescribing's impact on CDI. We described characteristics of community-associated (CA) CDI cases following antibiotics for dental procedures.

Methods. The Minnesota Department of Health (MDH) performs active population- and laboratory-based surveillance for CDI as part of the CDC's Emerging Infections Program (EIP). A case was defined as a positive *C. difficile* toxin or molecular assay on a stool specimen from a person >1 years old without a positive test in the prior 8 weeks, living in one of the five EIP catchment counties. Cases were classified as CA if stool was collected ≤3 days of admission or as an outpatient, with no overnight stay in a healthcare facility in the past 12 weeks. Medical records were reviewed and interviews performed to assess CDI risk factors and potential exposures. Differences in antibiotic prescribing and documentation among CA CDI cases receiving dental procedures were explored.

Results. During 2009–2015, 2176 presumptive CA CDI cases were reported to MDH; 1626 (75%) were confirmed as CA and interviewed. In total, 926 (57%) were prescribed antibiotics and 136 (15%) for dental procedures. Cases prescribed antibiotics for dental procedures were significantly older (median age: 57 vs. 45 years, $P < 0.001$), more likely to be prescribed clindamycin (50% vs. 10%, $P < 0.001$), and less likely to be prescribed fluoroquinolones (6% vs. 19%, $P < 0.001$) and cephalosporins (7% vs. 30%, $P < 0.001$) than those prescribed antibiotics for other indications. Among cases who received antibiotics for a dental procedure, 31 (23%) reported antibiotics on interview which were also documented in the medical record and 46 (34%) reported antibiotics for any reason on interview without documentation in the medical record.

Conclusion. Dental antibiotic prescribing rates are likely underestimated. Stewardship programs should address dental prescribing and alert dentists to CDI subsequent to antibiotics prescribed for dental procedures.

Disclosures. **All authors:** No reported disclosures.

79. Testing Stewardship: A 'Hard Stop' to Reduce Inappropriate *C. diff* Testing

Marci Drees, MD, MS[1,2,3]; Robert Dressler, MD, MBA[1,2,3]; Kim Taylor, BSN, RN[3]; Jamie Ayala, MSN, RN-BC[3]; Gaynelle Kahigian, EdD, MSN, RN[3]; Carol Briody, MT (ASCP), CIC[3]; Brian Stephan, BA[3]; S. Rani Singh-Patel, DO[3]; Sajid Noor, DO[3]; Stephen Eppes, MD[1,3]; [1]Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania; [2]Christiana Care Value Institute, Newark, Delaware; [3]Christiana Care Health System, Newark, Delaware

Session: 28. CDI Prevention
Thursday, October 5, 2017: 8:30 AM

Open Forum Infectious Diseases® 2017;1(S1):S1–71

DOI: 10.1093/ofid/ofx162