1287. Differences in Clinical Characteristics and Outcomes of Patients with Community-Onset Clostridium difficile Infection Who Tested Positive by EIA Compared with NAAT through a Two-Step Algorithm

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Background. The low sensitivity of toxin enzyme immunoassay (EIA) for the diagnosis of Clostridium difficile infection (CDI) motivated many laboratories to add nucleic acid amplification tests (NAAT) to their testing protocol. However, NAAT do not distinguish between colonization and infection, and indiscriminant testing could lead to overtreatment of CDI.

Methods. Active, population-based CDI surveillance has been conducted through the Emerging Infections Program in Bernalillo County, NM since 2011, with test type collected at the individual level since 2014. Community-onset (CO) CDI cases with a first positive test diagnosed by a two-step algorithm (concurrent EIA/GDH, with discordant results retested to NAAT) in 2014–2015 were included. We analyzed clinical characteristics and outcomes of patients EIA positive compared with NAAT positive. Demographics, risk factors, treatment, and outcomes were assessed through retrospective medical record review.

Results. Among 1,063 cases, 559 (52.6%) were EIA positive only and 504 (47.4%) were NAAT positive only. Of those with stool collected as a hospital inpatient, 57% were NAAT positive (P = 0.001); this increased from 43.4% if tested the day of admission to 61.4% when tested on day three. Conversely, 38.6% of patients with stool collected in an emergency department were NAAT positive (P = 0.004). Fewer cases with complicated outcomes were NAAT positive (40.7%, P = 0.023). Among those with no documentation of recent antibiotic use, 63.4% were NAAT positive (P < 0.001), and 67.8% cases with EIA and CDI treatment were NAAT positive (P = 0.005). Only 28.3% percent of cases with recurrent CDI were initially NAAT positive (P < 0.001).

Conclusion. EIA negative and NAAT positive CO-CDI cases tended to have a milder clinical presentation than those that were EIA positive. This suggests that some patients positive by only NAAT may have mild CDI or be colonized, rather than infected, with C. difficile. These individuals were less likely to have complicated outcomes, have recent documented antibiotic use, be treated for CDI, or have a recurrent CDI episode than those positive by EIA. Longer hospital stay correlated with increased proportions of testing EIA positive. Providers may benefit from considering testing protocol and clinical correlation when assessing patients with positive C. difficile test results.

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1288. Toxin Detection by Cell Culture Neutralization Assay (CYT) and Toxin based EIA [Tox EIA] among Recurrent Episodes of CDI Diagnosed by PCR

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Background. The Ad Hoc C. difficile surveillance working group defines recurrent infection as a second episode occurring >8 weeks after the initial index case. Due to its high sensitivity, diagnosis of recurrent CDI by PCR is extremely accurate. Due to its high sensitivity, diagnosis of recurrent CDI by PCR is extremely accurate. Longer hospital stay correlated with increased complications of recurrent CDI.

Methods. During a three month study period, CYT and Tox A/B EIA was performed on consecutive stool samples collected from PCR positive recurrent episodes of CDI. For the purpose of this study, recurrence was defined as a second episode occurring >8 weeks after the index case. Due to its high sensitivity, diagnosis of recurrent CDI by PCR is extremely accurate. Due to its high sensitivity, diagnosis of recurrent CDI by PCR is extremely accurate. Longer hospital stay correlated with increased complications of recurrent CDI.

Results. Thirty-five recurrent episodes occurred over the study period. 21/35 (60%) were positive by Tox A/B EIA only, and 14/35 (40%) were positive by CYT only. Among patients with toxin positive results, 66% of C. difficile poison positive CDI. The performance of CYT and EIA varied among recurrences due to relapse and reinfecion. These results have significant implication for reporting of CDI HAI rates.

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1289. PCR Cycle Threshold Derived Toxin Identifies Patients at Low-Risk for Complications of C. difficile Infection Who Do Not Require Treatment

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Background. Literature suggests that toxin detection differentiates those who require treatment for C. difficile infection (CDI) from those who do not. In-house studies have shown that free toxin can be predicted with high negative predictive value at a predefined cycle threshold (CT) using Xpert Cdx/B PCR (Cepheid, Sunnyvale, CA). In October 2016, CT-toxin was added to the PCR result and a comment recommends against CDI therapy if CT-toxin is negative (CT<0.01). Here we evaluate the effect of this reporting on treatment rates and outcomes of CT-toxin positive CDI episodes, 16 (46%) were genotypical confirmed as relapse with the original infection as a second episode occurring >8 weeks after the index case. Due to its high sensitivity, diagnosis of recurrent CDI by PCR is extremely accurate. Due to its high sensitivity, diagnosis of recurrent CDI by PCR is extremely accurate. Longer hospital stay correlated with increased complications of recurrent CDI.

Methods. Patients tested from October 2016 to Apr, 2017 with a positive Xpert PCR and CT-toxin positive result were included. Clinical data were collected by retrospective chart review and analyzed with the Chi squared and Student t-tests using SPSS. Due to multiple comparisons, α=0.01.

Results. Of 1516 Xpert PCR tests, 248 (16.4%) were positive and 98 (39.5%) were CT-toxin. Of these, 54 (55.7%) were treated. Patient characteristics and data at testing are shown below. There were no cases of CDI-related septic shock or toxic megacolon on review. Time to diarrhea resolution was significantly shorter in untreated patients and there was no difference in crude mortality or later onset of CT-toxin positive CDI.

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were reviewed by Infectious Diseases physicians blinded to the EIA results. Using the American College of Gastroenterology (ACG) classification system, CDI status was determined to be mild, moderate, severe, or complicated. Patients without significant diarrhea (<3 unformed stools / 24 hours) were considered colonized. Those without documentation of stools were classified as indeterminate. Correlation of clinical assessment with EIA results was assessed.

**Results.** Most of the PCR positive specimens (75%) were toxin EIA negative. Correlation of clinical assessment with toxin EIA is summarized in the table below. Among patients colonized vs. those with CDI, the percentages with negative toxin EIA results were 90% and 79%, respectively. CDI and PCR results were negative for 25 specimens—17 were from patients considered to have CDI.

| Clinical Assessment | No. | Row % | No. | Row % |
|---------------------|-----|-------|-----|-------|
| Indeterminate (11)  | 1   | 9.0%  | 10  | 90.9% |
| Colonized (39)      | 8   | 20.5% | 31  | 79.5% |
| CDI (250)           | 67  | 26.8% | 183 | 73.2% |
| Mild (47)           | 10  | 21.3% | 37  | 78.7% |
| Moderate (68)       | 21  | 30.9% | 47  | 69.1% |
| Fishbein (6)        | 6   | 23.1% | 20  | 76.9% |
| Complicated (109)   | 30  | 27.5% | 79  | 72.5% |
| Total (300)         | 76  | 25.3% | 224 | 74.7% |

**Conclusion.** Toxin EIA performed on samples positive for *C. difficile* by PCR does not reliably identify patients considered to have CDI with ACG criteria applied. CDH as an initial screen would not have detected 6.8% of patients with CDI.

129. Clinical Characteristics and Outcomes of Hematologic Malignancy Patients with *Clostridium difficile* Toxin EIA vs. PCR Positive Test Results
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**Background.** *C. difficile* infection is common in patients with hematologic malignancy. In our center, detection of *C. difficile* is increasing recognition that molecular (polymerase chain reaction) PCR assays are sensitive but cannot differentiate between symptomatic and asymptomatic patients. In addition, the yearly incidence of CDI in patients with hematologic malignancy is common in patients with hematologic malignancy. Treatment of *C. difficile* infection requires clinical judgment, and potentially anti-infective agents may be needed. Positive PCR results were more likely to have a WBC ≥15/mm³ (18% vs. 6%, P = 0.02). However, there were no differences in presence of fever, stool frequency, or imaging evidence of colitis at the time of testing. Medications in the prior 72 hours were similar, including the use of proton pump inhibitors of ≥40% and of laxatives of ≥28%. Clinical outcomes were also similar between patients with EIA vs. PCR positive tests: all-cause death (22% vs. 20%), recurrent CDI (9% vs. 13%), colostomy (1% vs. 4%), and megaloclon (0% vs. 3%). Most patients received treatment with oral vancomycin for a median duration of 14 days.

**Conclusion.** In patients with hematologic malignancy, those with EIA vs. PCR positive *C. difficile* test results were clinically similar. These findings suggest that algorithms for testing and treatment of *C. difficile* in hematologic malignancy patients will need to be specifically targeted towards this immunocompromised population.

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129. Using Clinical Decision Support to Improve Evidence Based Testing and Diagnosis of *Clostridium difficile* Infection
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**Background.** *Clostridium difficile* infection (CDI) requires clinical understanding of the disease and knowledge of diagnostic testing limitations. It is important for providers to utilize CDI testing only in patients with suspected disease. Real-time polymerase chain reaction (PCR) assays are sensitive but cannot differentiate between symptomatic and asymptomatic patients. Individual hospitals have reported a 50% to 100% increase in the rate of CDI after substituting toxin tests with molecular tests such as PCR. We conducted a quality improvement project, implementing clinical decision support in ordering diagnostic testing of CDI, while measuring the number of diagnostic tests ordered and positive results.

**Methods.** We implemented evidence based clinical decision support into Cerner order entry system on March 1, 2016. The Cepheid Xpert *C. difficile* molecular test is used for diagnosis of CDI at our facility. The decision support included a message stating “Use the test with caution in patients who are receiving tube feeds or recent laxative use” and prompted ordering providers to select one of three indications for using the test: 3 or more diarrheal stools per 24 hour period, leukocytosis with abdominal pain, or ileus. A control chart was used to monitor the number of tests ordered and positive tests per month (patient adults) for a total of 24 months; 14 months pre-intervention and 10 months post-intervention.

**Results.** A decrease in the number of tests ordered per month was seen post intervention. Average number of monthly tests ordered was 207 pre-intervention and 163 post-intervention. After controlling for patient-days per month, there was a 13.5% decrease in the number of tests ordered from a mean of 14.29 vs. 12.37 tests per thousand patient-days per month. This resulted in special cause variation (Figure 1). There was no special cause variation detected with the number of positive PCRs per month, pre and post intervention.

**Conclusion.** Implementing decision support into the electronic medical record may assist providers with evidence-based utilization of the *C. difficile* PCR by decreasing unnecessary testing. This decrease may also have an impact on overall hospital costs, antibiotic utilization, and public reporting related to CDI.

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129. Impact of a Multi-disciplinary *C. difficile* Action Team
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**Background.** *C. difficile* infection (CDI) is associated with increased length of hospital stay, morbidity, mortality, and cost of hospitalization. Early intervention by experts from multiple areas of practice such as gastroenterology (GI), infectious diseases (ID) and surgery can be essential to optimize care and increase utilization of novel treatment modalities such as fecal microbiota transplant (FMT) and specifically anti-infective and colon-preserving surgical management.

**Methods.** A multi-disciplinary *C. difficile* action team (MD-CAT) was implemented at University of Maryland Medical Center (UMMC) in March 2016 to engage appropriate specialty consultants in the care of CDI patients. The MD-CAT reviews positive *C. difficile* tests at UMMC and provides guidance and suggestions to the