Preventing a 7-day course reduced CDI risk by 45% (see table, adjusted relative risk)

**Background.** The incidence of *Clostridioides difficile* infection (CDI) has been rising among children, both in the community and hospital setting. The genomic variability and molecular epidemiology of *CDI* in children, especially with cancer, are poorly understood. We aim to evaluate the molecular epidemiology and relatedness of *CDI* isolates among inpatient and outpatient pediatric oncology and stem cell transplant patients (POTP) using whole-genome sequencing (WGS). Variability of the isolates was summarized by strain type (ST), and a minimum spanning tree was constructed, defining clusters of genetically related isolates as those with $<7$ alleles difference. Plausible epidemiologic links among the closely related strains such as receiving care on the same inpatient unit on the same day or on the same unit but on different days within 8 weeks before CDI were evaluated to identify potential transmission events.

**Results.** Among 141 CDI episodes in 89 patients; 103 stool samples were cultured, and 101 (98%) isolates were sequenced identifying 23 different strain types in 81 (80%) isolates. 34 (38%) patients had multiple episodes of CDI. 16 clusters of related isolates were identified (figure), 10 (62%) of which involved only multiple specimens from the same patient. For the 6 clusters involving multiple patients, epidemiologic investigation revealed only 2 (33%) potential transmission events.

**Conclusion.** WGS identified a highly diverse group of *CDI* isolates among POTP with CDI. Although WGS identified clusters of closely related isolates in multiple patients, epidemiologic investigation of shared inpatient exposures identified potential transmission in only two clusters. *CDI* transmission was uncommon.

**Prevent a 7-day course**

| Antibiotic | Adjusted 95% CI | Risk Ratio (95% CI) |
|------------|----------------|-------------------|
| No antibiotic | 0.84 | 0.70 |
| Any antibiotic | 1.93 | 1.30 | 0.55 (0.50, 0.60) |

**Substitute an antibiotic (7d)**

| Antibiotic | Risk Ratio (95% CI) |
|------------|-------------------|
| From ciprofloxacin | 1.46 |
| To cotrimoxazole | 0.90 (0.74, 1.22) |
| To nitrofurantoin | 0.63 (0.45, 0.76) |
| From nitrofurantoin | 2.03 |
| To amoxicillin-clavulanate | 1.83 |
| To amoxicillin | 1.26 (0.52, 0.59) |
| To levofloxacin | 1.48 |
| To ciprofloxacin-clavulanate | 1.83 |
| To amoxicillin-clavulanate | 1.24 (0.96, 1.64) |
| From clindamycin | 2.83 |
| To amoxicillin | 1.39 |
| To clindamycin | 0.89 (0.30, 0.35) |
| To amoxicillin-clavulanate | 1.83 |
| To amoxicillin | 1.27 (0.68, 0.93) |

**Reduce duration**

| Antibiotic | Risk Ratio (95% CI) |
|------------|-------------------|
| From 3 to 5d | 1.72 |
| To 3d | 1.49 |
| To 7d | 1.30 |
| To 5d | 1.17 |
| From 5 to 3d | 1.17 |
| To 5d | 1.09 |

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**2370. Risk Factors for *Clostridioides difficile* Colonization Among Adult Inpatients: A Meta-Analysis**

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**Session:** 251. HAI: *C. difficile* - Epidemiology

**Background.** *C. difficile* colonization is one of the most common causes of healthcare-associated infections in the United States. The prevalence of asymptomatic *C. difficile* colonization has been demonstrated to range from 3 to 21% for hospitalized adults. Patients colonized with *C. difficile* may serve as potential reservoirs for transmission of *C. difficile* infection (CDI) within inpatient units. The purpose of this meta-analysis was to identify the risk factors for colonization at hospital admission among adult patients, to inform strategies for infection prevention.

**Methods.** We searched MEDLINE, Scopus, Web of Science, and Embase from inception to 2019 for articles related to *C. difficile* colonization on hospital admission. Studies with multivariate analyses evaluating risk factors for asymptomatic colonization in adult inpatients were eligible. Odds ratios were pooled using a random effects model. Study quality and publication bias analyses were also conducted.

**Results.** Among 2,982 studies identified in the search, 21 studies met the inclusion criteria. Included studies reported 18,468 adult patients of which 1,243 were asymptptomatically colonized with *C. difficile*. Factors associated with an increased risk of colonization were CDI in the last 3 months (OR 4.18, 95% CI 2.56–6.82, $P = 0.00$), hospitalization in the last 6 months (OR 2.45, 95% CI 2.06–2.92, $P = 0.00$) and use of gastric acid suppression therapy within the last 8 weeks (OR 1.46, 95% CI 1.17–1.73, $P = 0.01$). Receipt of antibiotics in the last 3 months (OR 1.37, 95% CI 0.94–2.01, $P = 0.28$) and use of non-steroidal anti-inflammatory drugs (OR 0.90, 95% CI 0.52–1.55, $P = 0.57$) were not associated with statistically significant effects on colonization. There were insufficient studies to determine the association between most antibiotic classes and the risk of colonization.

**Conclusion.** *C. difficile* colonization on hospital admission was significantly associated with recent hospitalization, and gastric acid suppression therapy. Recognition of these risk factors may assist in identifying potential carriers of *C. difficile*. These findings also emphasize the importance of judicious use of gastric acid suppression and other preventative measures in reducing *C. difficile* acquisition.
Asymptomatic carriage of toxigenic C. difficile carriage was common among patients in healthcare facilities, but most carriers had transient low-level carriage. Additional studies are needed to determine whether a higher burden of carriage predicts subsequent risk of transmission.

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2372. PCR Ribotype and Antimicrobial Susceptibility of Clostridioides (Formerly Clostridium) difficile in Korea
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Session: 251. HAI: C. difficile - Epidemiology
Saturday, October 5, 2019: 12:15 PM

Background. Clostridioides difficile infection is a leading cause of healthcare-associated diarrhea. The epidemiology and characteristics of C. difficile vary geographically. We performed toxin enzyme immunoassay (EIA), toxigenic gene analysis, antimicrobial susceptibility tests (AST), and PCR ribotyping to elucidate the characteristics of C. difficile in Korea.

Methods. Between July 2017 and June 2018, C. difficile was prospectively isolated in 128 specimens from the culture of 1,182 unduplicated specimens. Seventy-five stool specimens with a positive toxin EIA between July 2016 and June 2017 were also included. We performed PCR for the tcdA and tcdB genes on these isolates, and AST and PCR ribotyping on the isolates with a positive toxin EIA.

Results. Older patients tended to have a higher rate of positive toxin EIA and positive cultures than did younger patients. Ribotype 018 was predominantly identified (48.6%), followed by ribotype 014/020 (9.9%), and ribotype 002 (8.3%). All of A+B+ isolates were either ribotype 017 or B-2. Ribotypes 017, 018, and B-2 showed high resistance to various antibiotics. In contrast, ribotypes 002, 014/020 and C-4 demonstrated low resistance rates, except that to moxifloxacin in ribotype 002. Clindamycin and erythromycin showed a positive correlation. Most of the isolates resistant to rifampicin or tetracycline showed a high MIC to both erythromycin and clindamycin.

Conclusion. Ribotype 018, which is highly transmissible and resistant to various antimicrobial agents, is predominant in Korea. Ribotype 002 has also been increasing in prevalence in Korea.

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2373. Impact of a Change in Testing Strategy for Clostridioides difficile Infection on a Publicly Reported Metric and Treatment Days of Therapy
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Session: 251. HAI: C. difficile - Epidemiology
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Background. In an effort to optimize diagnostic testing for Clostridioides difficile infection (CDI) our health system changed from stand-alone PCR testing to a “2-step” approach wherein all positive PCR results referred to EIA. We report the effects of this change on publicly reported CDI metrics and treatment days of therapy (DOT).

Methods. The setting includes 10 Cleveland Clinic Health System hospitals in northeast Ohio and one in Florida. On June 12, 2018, 9 NE Ohio hospitals changed from PCR alone to PCR followed by EIA. Stand-alone PCR testing remained at one and GDH / EIA / PCR for discordant for another. Testing volumes were obtained from the microbiology laboratory. C. difficile LabID event SIRs were obtained from NHSN. Public reporting interpretative categories were identified based on SIR for second half of 2018. DOT for CDI agents were obtained from an antimicrobial stewardship database.

Results. Among hospitals that changed strategy the volume of PCR testing and the percent PCR + was similar between time periods. EIA positivity ranged from 23% to 53%. 4/11 hospitals improved their public reporting category: 3/9 that changed testing strategy and 1/2 that did not (Table 1). Two of 3 that changed strategy and improved public reporting also had a decrease in DOT. DOT increased in the 2 hospitals that did not change strategy.

Conclusion. Six months after adopting a 2-step CDI testing strategy 7 of 9 hospitals had a lower SIR with 3 also demonstrating an improvement in public reporting category favorably impacting reputational and reimbursement risk for our healthcare system. CDI agent DOT was similar before and after the change. The impact of choice of test on publicly reported metrics demonstrates the difficulty of utilizing a proxy for hospital onset CDI, the CDI LabID event, as a measure of quality of care provided.