Degree of Concordance of *Clostridium difficile* Strains in Adults with Community-Associated *Clostridium difficile* Infection and Infants with *Clostridium difficile* Colonization

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Background

- The incidence of community-associated *Clostridium difficile* infection (CA-CDI) has increased in the last 10 years.
- Classic risk factors for CDI, such as high rates of antibiotic exposure, chronic health problems, and recent hospitalizations are not predominant in patients with CA-CDI.
- Adults with CA-CDI and low-level healthcare exposure are more likely to be exposed to infants younger than 1 year of age, indicating that infants may be a reservoir for strains that cause CA-CDI.

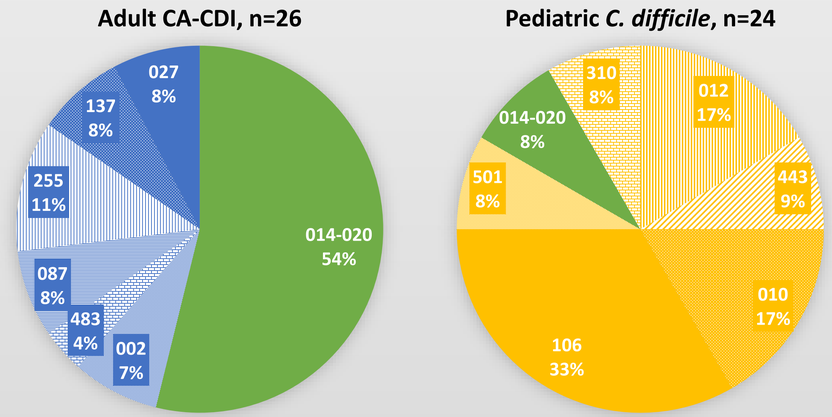
Hypothesis

- Healthy infants share similar ribotypes of *C. difficile* as those seen in adults with CA-CDI.

Methods

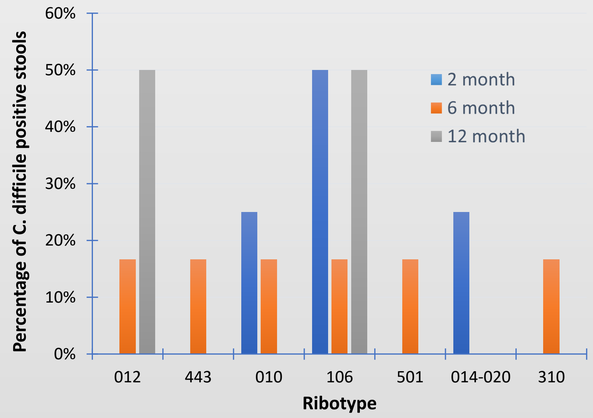
- Toxin PCR positive stool specimens were obtained from a clinical microbiology laboratory of a 1,032-bed tertiary care hospital. Stool samples sent as part of routine clinical care were stored at -80C until used for analysis.
- The subset of stool samples meeting the Infectious Disease Society of America (IDSA) criteria for CA-CDI were used for the current report.
- A concurrent group of healthy infants were recruited from a demographically diverse local pediatrician's office, located 6 miles from the referral hospital, and followed for 1 year. Stool samples were collected at birth, 2-, 6-, and 12-month well-visits.
- Adult and pediatric stool samples were inoculated on pre-reduced CCFA agar under strict anaerobic conditions.
- DNA from positive samples were isolated and underwent fluorescent PCR ribotyping. Amplicons were assigned to specific ribotypes through sequence analysis using previously proposed nomenclature (J Clin Microbiol. 2015; 53:1192).

Figure 1: Distribution of *C. difficile* PCR ribotypes in our adult population with CA-CDI and healthy infants with *C. difficile* positive stool cultures.



- Adult samples were collected between August 1, 2016 and January 31, 2018.
- Infant samples were collected between July 1, 2016 and March 31, 2018.
- 91% of pediatric samples were toxigenic.
- 18% of cultured *C. difficile* [3 adults, 8 infants], were non-typeable, including all non-toxigenic strains.
- Blue and yellow pie slices represent ribotypes that were unique to adults and children, respectively.

Figure 2: : Longitudinal distribution of *C. difficile* PCR ribotypes as a function of age



No *C. difficile* was isolated from any of the subjects at birth. 1 infant had ribotype 010 at 2- and 6-months and ribotype 106 at 12-months.

Conclusions

- The distribution of ribotypes were different at each infant well-visit.
- The most common ribotype in infants was F106.
- The most common ribotype in adults was 014-020.
- Ribotype 014-020 appeared in both populations. All other ribotypes were unique to adults or children.

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