Risk Factors for Community-Associated Clostridium difficile Infection in Children

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2282. Clinical and Radiologic Manifestations of Cat-Scratch Osteomyelitis in Children

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Session: 250. Pediatric Bacterial Infections: From A to Z
Saturday, October 7, 2017: 12:30 PM

Background. Osteomyelitis (OM) is a rare sequela of cat scratch disease (CSD), often with atypical bone involvement. Clinical presentation of CSD OM is not well described. We sought to determine the clinical and radiologic manifestations of OM cases admitted to Nationwide Children’s Hospital.

Methods. EMR of inpatients was reviewed between January 2010 and March 2017. Clinical, radiological, and histopathological findings were collected.

Results. Nine patients with positive cat scratch serology and/or tissue PCR were identified. Mean age was 6 years and 8 months (range 3–12 years). Patients had a prolonged course of illness before the diagnosis was made (mean 9.7 days). All patients had fever and affected bone area pain. Patients had normal WBC (mean 11,800/mm3) and modest ESR (mean 53.2 mm/hours) and CRP (mean 5.2 mg/dl) elevations on admission. Six patients had osteomyelitis at ≥ 2 sites (multifocal) with no contiguous lymphadenopathy (LAD). The vertebral and pelvic girdle were the most common sites. Two patients had contiguous paraspinal abscesses, and 1 patient had a concomitant lymph node (LN) abscess. No osteolytic lesions were identified. Serology in all sites was confirmed. There were no reports of diaphyseal, tarsal, and pertussis vaccine (DTP).

Conclusion. We identified a high prevalence (75.7%) of B. pertussis infection in children up to 6 months of age. This is likely explained by the low vaccination rate (18.2%) and the low percentage of exclusive breastfeeding of the studied population. The low rate of vaccination is unexpected, given that there has been greater access to vaccination in recent decades in Brazil. In addition, the cases involved with an atypical clinical presentation, since the classic symptoms of cat scratch fever were absent or had a short duration that such symptoms were no longer present at the time of hospitalization. Our study does not exclude the possibility that genetic changes are occurring in the circulating strains of B. pertussis and that DTP seems to have less efficacy on these new strains, but future studies will be needed to specifically test this hypothesis.

Disclosures. All authors: No reported disclosures.


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Background. CT remains the most prevalent STI in developed and developing countries. Prenatal screening and treatment of pregnant women has resulted in a dramatic decrease of perinatal CT infection. There have been limited seroepidemiologic studies in unselected children and adolescents following the implementation of routine CT screening as first recommended by the CDC in 1993.

Methods. Anonymized banked sera (−80°C) and prospectively collected sera from children and adolescents in Brooklyn, NY, were tested for anti-CT IgG via a validated enzyme immunoassay. Serum samples were divided by collection years: Group 1 (1991–1995, pre-screening) and Group 2 (2012–2015, post-screening). Infants <1 year of age were excluded due to interference of maternal antibodies. Maternal screening and CT infection rates during pregnancy were determined via a retrospective review of 200 random charts (2016–2017). Statistical analysis by Fisher’s exact test.

Results. 297 serum samples were identified (age range 1–20 years). 18.5% (50/271) of subjects ≤10 years of age in Group 1 tested positive for anti-CT IgG, while none tested positive in Group 2 (0/55), P = .0006. Children >10 years had a prevalence of 10.3% (3/29) in Group 1 and 7.5% (12/159) in Group 2, P = .7. Maternal screening test was estimated at 95.3%, with 100% screened if <25 years of age. The rate of maternal screening during pregnancy was 4.5% (9/200) overall, 8% (4/49) in <25 year olds and 3.3% (5/151) in ≥25 year olds.

Conclusion. Children ≤10 years of age in the pre-screening group (1991–1995) had relatively high rates of seropositivity, likely due to persistence of antibody from perinatal infection. The absence of CT symptoms in children ≤10 years of age in the post-screening group (2012–2015) and the high rate of prenatal screening (>95%) in this high-risk population suggest prenatal screening and treatment of pregnant women has been effective at preventing perinatal CT infection.

Disclosures. All authors: No reported disclosures.
Incident rate of CDI was 17 per 100,000 children. Though not statistically significant, there appeared to be a higher proportion of cases than controls had: an underlying chronic medical condition (33.3% vs 11.9%; P = 0.02); a neonatal intensive care unit (NICU) stay at time of birth (26.9% vs 13.2%; P = 0.04); or recent antibiotic exposure (53.6% vs 20.6%; P = 0.0001). More cases than controls had recent higher-risk outpatient healthcare exposures (emergency department, outpatient procedure and surgical centers, hospital-based outpatient settings, or urgent care) (34.9% vs 19.1%; P = 0.06) or a household member with diarrhea (36.2% vs 20.6%; P = 0.05). No difference was found in the proportion of cases and controls who had a feeding tube (2.9% vs 0%; P = 0.50) or a recent exposure to gastric acid suppressants (6.1% vs 2.9%; P = 0.63).

Young children with underlying disease, NICU stay, or recent antibiotic use might be at higher risk for CA-CDI. Improving outpatient antibiotic use, particularly among children with comorbidities, might reduce CA-CDI in this population. Further investigation of other risk factors, including outpatient healthcare and household exposures, is needed.

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**2287. Risk Factors for Recurrent Pediatric Community Associated **Clostridium difficile** Infection**

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**Session: 250. Pediatric Bacterial Infections: From A to Z**

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**Background.** As rates of pediatric community-associated (CA) **Clostridium difficile** infection (CDI) increase, additional research is needed to address the paucity of data in this cohort. Studies in pediatrics suggest concurrent antibiotics, CA CDI, malignancy, recent surgery, the number of antibiotic exposures by class and tracheostomy as independent risk factors for recurrent CDI (rCDI).

**Methods.** This study was a retrospective review of the electronic health records of all children 1-17 years with stool specimens sent for **C. difficile** from January 1st 2012 – December 31st 2016 at Kaiser Permanente Northern California. Children with clinical symptoms consistent with CDI, confirmatory laboratory testing, no other identified causes of diarrhea, and community associated disease were defined as cases. The incident rate of **C. difficile** was 17 per 100,000 children.

The overall rate of recurrence in our cohort was 8.5%. Race and having a diagnosis of inflammatory bowel disease (IBD) were statistically significant risk factors for rCDI. Compared with other races, we observed increased rates of rCDI in multi-racial and "other/unknown" children. Though not statistically significant, there appeared to be a correlation between the age subset of 2-5 years of age and developing rCDI. (Table)

**Table: Demographics and comorbidities in rCDI**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Total Primary Recurrence &lt;8wk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>131 (25.8) 6 (4.6)</td>
<td>0.09</td>
</tr>
<tr>
<td>2-5</td>
<td>131 (25.8) 22 (16.8)</td>
<td></td>
</tr>
<tr>
<td>6-11</td>
<td>87 (17.2) 6 (6.9)</td>
<td></td>
</tr>
<tr>
<td>12-17</td>
<td>158 (31.2) 20 (12.7)</td>
<td></td>
</tr>
<tr>
<td>Sex Female</td>
<td>247 (48.7) 21 (8.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>260 (51.3) 22 (8.5)</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>244 (48.1) 21 (8.6)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>133 (26.2) 8 (6.0)</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>67 (13.2) 4 (6.0)</td>
<td></td>
</tr>
<tr>
<td>African</td>
<td>31 (6.1) 2 (6.5)</td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>23 (4.5) 6 (26.1)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>9 (1.8) 2 (22.2)</td>
<td></td>
</tr>
<tr>
<td>IBD No</td>
<td>340 (67.1) 22 (6.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>167 (32.9) 21 (12.6)</td>
<td></td>
</tr>
<tr>
<td>Malignancy</td>
<td>477 (94.1) 39 (8.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 (5.9) 4 (13.3)</td>
<td></td>
</tr>
</tbody>
</table>

**Conclusion.** High suspicion for recurrence must be maintained in multi-racial or non-Caucasian, Hispanic, Asian, or African American children and those with underlying rCDI for CDI in children.

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

**2288. Clostridium difficile Molecular Epidemiology in a Prospective Cohort of Canadian Children Compared with Cases of **Clostridium difficile** Infection**

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**Session: 250. Pediatric Bacterial Infections: From A to Z**

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**Background.** **Clostridium difficile** is a notorious nosocomial pathogen, but little is known regarding the colonization commonly observed in children. It is suspected that **C. difficile** carriage in infants is a reservoir for toxigenic strains. To test this hypothesis, we sought to determine the genetic relatedness between a prospective cohort of **C. difficile** toxin gene positive healthy children and those with acute gastroenteritis (AGE) and strains identified in adult and pediatric **C. difficile** infection (CDI) cases from Alberta, Canada. Additionally, we compared **C. difficile** toxin production in healthy and AGE children.

**Methods.** **C. difficile** was cultured from 97 hospitalized CDI cases (n = 79 adult; n = 18 pediatric) from stool samples tested positive for toxigenic **C. difficile** by C.DIFF QUIK CHEK COMPLETE™ enzyme immunoassay (ELIA) in 2015 and 2016, and confirmed positive for toxin genes by the Luminex xTAG® Gastrointestinal Pathogen Panel from a prospective cohort of 59 children with AGE seeking care at the emergency department and 17 healthy children attending public health clinics. Isolates were then characterised by PCR-ribotyping, pulsed-field gel electrophoresis (PFGE), PCR of the tcdA, tcdB, tcdC, and cdb genes and **C. difficile** toxigenicity by ELIA for a subset of 14 healthy and 45 AGE children.

**Results.** Ribotype 106 was predominant among all pediatric isolates (n = 21, 27.6% AGE and healthy children; n = 5, 27.8% pediatric CDI) and ribotype 027 in adult CDIs (n = 35, 44.3%). Eighteen ribotypes were shared between children and CDI cases (n = 134, 77.5%). Sixteen unique ribotypes and PFGE patterns (n = 84, 48.6%) were identified in two or more cohorts. Similar toxin gene profiles were observed across the three cohorts, but adult CDI isolates had a higher proportion of binary toxin positive isolates (n = 42, 53.2%) compared with children (n = 3, 3.95%) and pediatric CDI (n = 8, 9%). **C. difficile** toxigenicity was similar (P = 0.23) amongst the subset of healthy (n = 6, 42.9%) and AGE (n = 28, 62.2%) children.

**Conclusion.** Production of **C. difficile** toxins in children was not significantly associated with symptoms of AGE. **C. difficile** strains found in children were similar to those from CDI cases; especially pediatric cases. This suggests that strains might be shared, and the development of CDI may be related to factors other than **C. difficile** strain type.

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