Letters to the Editor

Low Incidence of Concurrent Enteric Infection Associated with Sporadic and Outbreak-Related Human Cryptosporidiosis in Northern Ireland

Human cryptosporidiosis has emerged as an important gastrointestinal infection in the 1990s due to the ingestion of contaminated water and foodstuffs containing the protozoan parasite Cryptosporidium spp. (4, 9). This pathogen has particular clinical significance for immunocompromised persons, including AIDS patients and cancer patients as well as from hospital wards. From these, Cryptosporidium sp. was detected by employment of the modified Ziehl-Neelsen acid-fast staining technique in 255 (2.8%) and 191 (1.8%) cases in 2000 and 2001, respectively, with the majority of cases involving children. The age distribution of cryptosporidial cases in 2000 was 46.7% for patients of <5 years, 18.4% for patients from 6 to 10 years, 9.8% for patients from 11 to 20 years, and 25.1% for patients of >20 years. In 2001, the age distribution was 34.0% for patients of <5 years, 16.2% for patients from 6 to 10 years, 6.3% for patients from 11 to 20 years, and 43.5% for patients of >20 years. During these 2 years, there were three waterborne outbreaks of cryptosporidiosis, as previously described (6). Correcting for the outbreaks, the prevalence of sporadic cases during this time was 2.0% (183 of 9,165) and 1.4% (147 of 10,832) for 2000 and 2001, respectively. In addition to undergoing conventional cryptosporidial microscopic analysis, all fecal specimens were concurrently examined for Campylobacter spp., serotypes of Salmonella enterica, Shigella spp., Escherichia coli O157:H7, and Yersinia enterocolitica, in accordance with previously published methodologies (2). In addition, fecal specimens were analyzed for Clostridium difficile by employment of the Oxoid Toxin-A kit in accordance with the manufacturer’s instructions (Oxoid Ltd., Basingstoke, England) and for other parasitic ova and cysts on request by the attending physician. The frequency and distribution of concurrent enteric infections with Cryptosporidium spp. are shown in Table 1, while the prevalence of bacterial fecal pathogens in stool specimens which were negative for Cryptosporidium spp. is shown in Table 2. Overall, in 446 episodes of cryptosporidiosis in the same number of patients over this 2-year period, there was 2.0% coinfection with another enteric pathogen and C. parvum, where Campylobacter sp. accounted for the most frequently isolated copathogen (1.1%; 5 of 446), followed by Salmonella (0.45%; 2 of 446) and others (0.45%; 2 of 446). Similarly, the Intestinal Infectious Disease study in England demonstrated 2.6% (1 of 39) coinfection with Campylobacter sp. and 2.6% (1 of 39) coinfection with Giardia lamblia (Giardia duodenalis) (2). This study also demonstrated a significantly higher incidence of cryptosporidiosis in rural areas than in urban areas and a higher incidence in the north of England than in the Midlands and the south of England. In addition, there has been a previous association between Cryptosporidium and Campylobacter infection in a waterborne outbreak in the north of England (5).

The occurrence of mainly single-pathogen infection (98%) is of interest in trying to elucidate the potential reservoirs of this parasite in the local context. The three waterborne outbreaks produced only two cases of concurrent infection with an additional pathogen (Table 1). Furthermore, in all coinfection cases, with the exception of the patient with the positive Clostridium difficile toxin assay, none of the patients presented previously with a positive fecal specimen of the coinfecting organism. Although these outbreaks were associated with the contamination of final drinking water with animal and human feces, no other enteric pathogen was associated with the outbreaks. As animal feces and human sewage have previously been shown to be heavily contaminated with enteric pathogens (3, 7), as water has been shown to be an important vehicle in

<table>
<thead>
<tr>
<th>Year and type of infection</th>
<th>No. of cases</th>
<th>Other enteric pathogen isolated</th>
<th>Age (yr) of patient with concurrent infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sporadic</td>
<td>183</td>
<td>Campylobacter sp.</td>
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<tr>
<td></td>
<td></td>
<td>Campylobacter sp.</td>
<td>4</td>
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<tr>
<td></td>
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<td>Salmonella enterica</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Typhimurium</td>
<td>20</td>
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<tr>
<td></td>
<td></td>
<td>Salmonella enterica</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enteritidis</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Giardia lamblia</td>
<td>9</td>
</tr>
<tr>
<td>Outbreak-related</td>
<td>72</td>
<td>Campylobacter sp.</td>
<td>6</td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sporadic</td>
<td>147</td>
<td>Campylobacter sp.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Campylobacter sp.</td>
<td>2</td>
</tr>
<tr>
<td>Outbreak-related</td>
<td>44</td>
<td>Clostridium difficile</td>
<td>71</td>
</tr>
</tbody>
</table>

Table 1. Prevalence and etiology of mixed enteric infections associated with sporadic and outbreak-related cases of human cryptosporidiosis.
the transmission of viable oocysts to humans (11), and as chlorination has been shown to be inefficient as an effective disinfection process against C. parvum (8), enteric pathogens in animal and human fecal material contaminating water may be eliminated by residual chlorine, with the exception of cryptosporidial oocysts. Our coinfection data are in marked contrast to those for cryptosporidial infection in underdeveloped and developing countries, where coinfection with other enteric pathogens is common. In Nepal, Sherchand and Shrestha (12) reported a coinfection rate of 13% with other enteric pathogens, whereas Okafor and Okunji (10) reported a coinfection rate of 16.7% in Nigeria. In Egypt, Abaza et al. (1) demonstrated a significant association between mixed infections with G. lambia and C. parvum in immunocompromised patients.

In conclusion, individuals with symptomatic cryptosporidiosis have a low probability (2%) of being coinfected with a secondary enteric pathogen locally. This probably reflects the fact that in an urban western European population with a chlorinated water supply, there is less overlap between the risk factors of Cryptosporidium and those of the other enteric pathogens.

REFERENCES


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