The Community Acute GastroEnteritis (CAGE) Study: Prevalence of Acute Gastroenteritis and Enteric Virus Infection in the Community

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Introduction

- In the United States, Acute Gastroenteritis (AGE) is generally estimated to contribute more than 37 million cases of illness and 600,000 hospitalizations annually.
- Precise data are limited on the occurrence and characteristics of sporadic AGE, particularly related to viral pathogens.
- Using data from a large integrated health care system, we aimed to:
  - Estimate the average, 5-day point prevalence of AGE over a 1-year period.
  - Describe the relationship between reporting AGE symptoms and:
    - Calculating the proportion of stool samples testing positive for enteric viral pathogens among those with AGE symptoms.

Methods

- Beginning in October 2015, we recruited 21 weekly, age-stratified, random samples of members from Kaiser Permanente Northwest (KPNW) to complete an online survey each week for a total of 26 weeks.
- We excluded participants with stool samples that were positive for enteric virus.
- Stool samples were tested for norovirus, astrovirus, sapovirus, and rotavirus by RT-PCR.

Results

- We obtained a total of 7,857 completed surveys out of 12,840 recruited KPNW members (70.1% response rate). All stool samples were analyzed for enteric viruses, with no stool samples returned.
- Overall, we observed an overall 55% reported prevalence of AGE by age (Figure 1).
- Overall, 10% of participants reported a viral enteritis-related illness, mostly in those 2 years of age (Figure 2).
- Antibiotic treatment for AGE was more common among adults and children, whereas use of probiotics and enemas was common in children (Table 1).
- Any antibiotic treatment for AGE symptoms was higher among adults than children.
- Among the subset of participants for whom stool samples were collected and tested, rotavirus was the most common viral etiology identified among those reporting AGE symptoms (Table 2).

Discussion

- The overall prevalence of AGE found in our study is comparable to, but slightly higher than, the 6% reported in previous population-based surveys.
- The overall proportion of our study participants seeking care for an illness of AGE is also higher than that found in previous surveys, although the proportion of our study participants with an outpatient visit is comparable.
- Patients with AGE symptoms often seek medical treatment; however, many choose to access care through email or phone consultation at first.
- Concerted efforts of the Clinical Practice Group to define guidelines of AGE for primary care providers are needed to determine whether reported antibiotic use was associated with AGE due to a bacterial etiology.
- While we acknowledge that the studies of norovirus, astrovirus, and rotavirus are necessary for the understanding of enteric pathogens and potential outbreaks associated with AGE, we cannot determine the accuracy of reporting.
- Additional studies are needed to guide the development of targeted, targeted, and anticipated interventions of infections, such as vaccines.

References


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Table 1: Treatment taken to reduce symptoms among adults and children reporting AGE.

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>ADULTS</th>
<th>CHILDREN</th>
<th>P-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTIBIOTICS</td>
<td>15 (7)</td>
<td>8 (7)</td>
<td>0.34</td>
</tr>
<tr>
<td>PROBIOTICS</td>
<td>20 (9)</td>
<td>36 (48)</td>
<td>0.63</td>
</tr>
<tr>
<td>MARYNU</td>
<td>20 (11)</td>
<td>0</td>
<td>0.38</td>
</tr>
<tr>
<td>ANTIVIRAL</td>
<td>41 (4)</td>
<td>18 (10)</td>
<td>0.037</td>
</tr>
<tr>
<td>ANTIREFLECTIC</td>
<td>95 (1)</td>
<td>54</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ANTIBIOTIC</td>
<td>95 (2)</td>
<td>8</td>
<td>0.30</td>
</tr>
<tr>
<td>ANTIBIOTIC</td>
<td>114 (3)</td>
<td>95 (2)</td>
<td>0.009</td>
</tr>
</tbody>
</table>

Table 2: Proportion of stool samples testing positive for enteric viral pathogens among those who did AGE (n=774) and did not suffer from AGE (n=277)

<table>
<thead>
<tr>
<th>PATHOGEN</th>
<th>ADULTS</th>
<th>CHILDREN</th>
<th>P-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORVIR</td>
<td>8 (4)</td>
<td>68 (4)</td>
<td>0.009</td>
</tr>
</tbody>
</table>

Figure 1: Proportion of CAGE survey respondents reporting AGE symptoms within the previous 5 days (n=774), by age and sex.

Figure 2: AGE-related health care encounters among those reporting symptoms (n=774), by encounter type.

Figure 3: Proportion of stool samples testing positive for enteric viral pathogens among those who did AGE (n=774) and did not suffer from AGE (n=277) reporting AGE symptoms.