Short Communication

High Prevalence of G12 Human Rotaviruses in Children with Gastroenteritis in Myanmar

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SUMMARY: Human rotavirus samples from 54 children with acute gastroenteritis in Myanmar in 2011 were subjected to reverse transcription-PCR to determine their G and P types. On G typing, G2 (24/54; 44.4%) was found to be the most prevalent, followed by G12 (17/54; 31.5%) and G1 (1/54; 1.9%). Mixed cases with G2 and G12 were found in 12 of the 54 (22.2%) samples. On P typing, P[4] was found to be the most predominant (29/54; 53.7%), followed by P[8] (17/54; 31.5%) and P[6] (4/54; 7.4%). Mixed cases with P[4] and P[8] were detected in 4 of 54 (7.4%) samples. Thus, occurrence of G2 and unusual G12 in high proportions was characteristic of human rotaviruses in Myanmar in this study setting.

Human group A rotaviruses are the major pathogens causing acute non-bacterial gastroenteritis in infants and young children worldwide. It has been estimated that rotavirus infections are responsible for the deaths of approximately 400,000 children per year in developing countries (1). Also in developed countries, rotavirus gastroenteritis is associated with severe cases requiring hospitalization. Furthermore, some of central nervous system disorders, including encephalopathy, appear to be related to rotavirus infections. With this background, 2 live rotavirus vaccines have been licensed worldwide and are included in the scheduled immunization programs in many countries.

Two rotavirus outer capsid proteins, VP7 and VP4, are independently associated with the G and P types, respectively. A cutoff value of 80% nucleotide sequence identity has been employed for defining distinct G and P types (2). At least 27 G types and 37 P types have been reported to date in mammalian and avian species. In humans, at least 10 G types and 10 P types have been identified: G1 to G4 and G9 are the major G types, with G5, G8, and G12 being the unusual ones, while, P[8] is the most common, followed by P[4], P[6], and P[9]. G1P[8] is the most frequent G and P combination in the rotaviruses isolated from symptomatic humans worldwide (3).

Although global surveys on the G and P types of human rotaviruses have been extensively performed, there have been few epidemiological studies on human rotaviruses in Myanmar (4,5). In this study, we characterized human rotaviruses in Myanmar by genotyping the VP7 and VP4 genes, and found a high prevalence of G2 and unusual G12.

Stool specimens were collected from children with gastroenteritis in the Defense Services Obstetrics, Gynecology and Children Hospital, Yangon, Myanmar. The ages of children ranged from 2 months to 3 years. Fifty-four rotavirus-positive diarrheal children selected randomly were enrolled in a double-blind, placebo-controlled clinical trial of rotavirus-specific IgY conducted between January 2011 and March 2011 (6). Stool suspensions (10%) were prepared from the stool specimens collected from the 54 children before the start of the trial.

For G typing and P typing, rotavirus double-stranded RNAs extracted from the stool suspensions were used as templates for reverse transcription-PCR (RT-PCR) in 2 steps (first and second amplifications) as described previously (7–9). A total of 54 rotavirus RNA samples from stool specimens of Myanmar children with acute gastroenteritis were subjected to RT-PCR for G typing using different 2 primer sets for the second amplification (7,8). As shown in Table 1, G2 was the most prevalent type, being found in 24 (44.4%) of the 54 rotavirus-positive specimens. Notably, unusual G12 was found in 17 (31.5%) samples. Only 1 sample contained G1. Mixed cases with G2 and G12 were found in 12 (22.2%) samples. P typing demonstrated the predominance of P[4], occurring in 29 of the 54 specimens (53.7%), followed by P[8] in 17 (31.5%) cases. P[6] was detected in 4 (7.4%). Mixed infections with P[4] and P[8] were detected in 4 (7.4%). Four distinct G and P type combinations were identified: G1P[8], G2P[4], G12P[6], and G12P[8].

The distribution of G and P types has been examined globally. Although the occurrence of G and P types...
Prevalence of G12 Human Rotavirus in Myanmar

Table 1. Distribution of G types and P types of human rotaviruses recovered from children with acute gastroenteritis in Myanmar

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<tr>
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<tbody>
<tr>
<td>G1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1 (1.9)</td>
</tr>
<tr>
<td>G2</td>
<td>24</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>24 (44.4)</td>
</tr>
<tr>
<td>G12</td>
<td>0</td>
<td>4</td>
<td>11</td>
<td>2</td>
<td>17 (31.5)</td>
</tr>
<tr>
<td>G2 + G12</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>12 (22.2)</td>
</tr>
</tbody>
</table>

TOTAL (%) 29 (53.7) 4 (7.4) 17 (31.5) 4 (7.4) 54 (100)

Conflict of interest None to declare.

REFERENCES


