Rotavirus is a well-documented pathogen associated with gastro-intestinal illness in infants and young children. In various studies conducted throughout the world rotavirus has been shown to have a particular seasonal distribution. In the temperate zones, where there are marked differences in climatic features — such as temperature and relative humidity — over the course of the year, a seasonal pattern of rotavirus-associated gastro-enteritis has been indicated with a peak during the winter months. However, in tropical climates rotavirus infection appears to have a similar distribution throughout the year.

In several studies conducted in and around Johannesburg, a peculiar difference has emerged between the different racial groups. In the white population, the incidence of rotavirus-associated diarrhoea has tended to follow the seasonal pattern seen to prevail in temperate climates, with a peak incidence in the winter months. However, in the black population rotavirus infection seems to have a non-seasonal pattern, with a low threshold constant throughout the year.

A pilot study of the prevalence of rotavirus-associated gastro-enteritis in black children at Ga-Rankuwa Hospital was initiated in March 1982, to detect any seasonal pattern.

Patients and methods

During 1982, over 3000 babies were admitted to the Gastro-enteritis Unit at Ga-Rankuwa Hospital. Between March and December of that year, rectal swabs were taken from 256 of these patients (age range 3 weeks - 36 months, mean of 9.8 months) and tested for the presence of rotavirus.

Two rectal swabs were taken from each child in the study and stored at -20°C until processed. The eluted swabs were tested in duplicate by enzyme-linked immunosorbent assay (ELISA) (Rotazyme; Abbott Laboratories) and only considered positive if both were positive. The procedure for the ELISA test was as specified by the manufacturer, and was measured by a Quantum II spectrophotometer.

Results

Rotavirus-associated gastro-enteritis was found in 84 of the 256 patients (32.8%) (Table I). Of the 99 specimens collected between May and August (i.e. the winter months), 50 were positive (50.5%). Only 14 of the 111 specimens (12.6%) collected between September and December (spring and early summer) were positive for rotavirus. The highest degree of positive association was measured in August (71%) against the lowest in November (0%). The data are summarized in Fig. 1.

A Pearson's χ²-test showed a significant relationship (P = 0.05) between the presence of rotavirus excretion and the month (i.e. indicative of season) of the year.

The age range of the rotavirus-infected patients was 1 - 29 months, with a mean age of 8.4 months. Infants less than 6 months old were those most commonly infected (Table II).

Discussion

There was a seasonal distribution in the number of patients admitted to the unit for rehydration, with a 10-fold increase in...
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**TABLE II. ROTAVIRUS INFECTION BY AGE**

<table>
<thead>
<tr>
<th>Age (mo.)</th>
<th>No. with diarrhoea</th>
<th>No. infected with rotavirus</th>
<th>% positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 6</td>
<td>86</td>
<td>33</td>
<td>38.4</td>
</tr>
<tr>
<td>6 - 12</td>
<td>75</td>
<td>21</td>
<td>28.0</td>
</tr>
<tr>
<td>13 - 18</td>
<td>34</td>
<td>11</td>
<td>32.4</td>
</tr>
<tr>
<td>19 - 24</td>
<td>17</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td>24 - 29</td>
<td>4</td>
<td>2</td>
<td>50.0*</td>
</tr>
<tr>
<td>Unknown</td>
<td>40</td>
<td>14</td>
<td>35.0</td>
</tr>
</tbody>
</table>

*These numbers are so small that they can be regarded as inaccurate.

Fig. 1. Distribution of rotavirus-positive patients and the climatological factors.

January (midsummer) over July (midwinter), 700 v. 71 respectively. There was also an apparent inverse seasonal distribution of the sample showing rotavirus-associated gastro-enteritis, higher in the colder months of the year and dropping sharply in the late spring and early summer. There were two peaks of rotavirus activity, the first being in April with a higher peak present in August. These two peaks of rotavirus-associated illness would seem to be related to climatic conditions (Fig. 1).

Our findings agree with published results for rotavirus-associated disease patterns in temperate climates in other parts of the world. The other studies conducted in the RSA among the black population indicate a non-seasonal year-round pattern similar to that seen in tropical climates where a low threshold of rotavirus activity is present throughout the year. We have found a distinct seasonal pattern in the occurrence of rotavirus-associated gastro-enteritis among black infants at Ga-Rankuwa Hospital.

A large proportion (38.4%) of our rotavirus-positive samples were from babies under the age of 6 months, who are not commonly considered part of the target group of susceptible infants. This factor may be responsible for the discrepancy in the RSA, since the black infants tested by Schoub et al. were in the age group 6 - 24 months. They point out that early exposure to rotavirus during the neonatal period may offer protection against gastro-enteritis in the target age group. We found significant rotavirus infection in the black population under the age of 6 months and that it was associated with illness. The high antibody levels present in the young black population also indicate that this population group is exposed to rotavirus at an early age.

Since the available data are limited and in contrast to those reported elsewhere in the RSA, a more systematic study is under way to investigate more fully the factors in rotavirus-associated illness in the Ga-Rankuwa area. The results to date indicate the same general trends as those suggested by this pilot study.

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REFERENCES