Shift in the prevalence of long and short electrophoretic patterns of rotavirus isolated from faecal samples of children in Merida Yucatan, Mexico.

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SUMMARY.

Rotaviruses are the most important causal agents of acute diarrhoea diseases (ADD). Longitudinal studies have revealed changes in the pattern of the predominant electrophoretype in the same region. All the report regard that the long electrophoretype pattern is encountered more predominant than the short electrophoretype. From January 1985 to December 1990, fecal samples taken from 827 children suffering ADD and attending at the General Hospital O’Horán in Merida, Yucatan, Mexico were analyzed by Polyacrylamide gel electrophoresis and stained with silver nitrate. The age median were of 12 months. Of this group 536 patients were hospitalized, whereas the remaining 291 children were examined in the outpatients’ clinic. Rotaviruses were detected in 150 (28%) of 536 hospitalized children with ADD and in 29 (10%) of 291 patients examined in the outpatients’ clinic. The prevalence of the long electrophoretic pattern was higher than the short pattern in the four initial years of the study (relation 9:1). In different form, during the two last years of the study (1989-1990) the long and the short pattern were identified in equal prevalence. The biological significance of this unusual change of electrophoretic pattern is still unknown.

Keywords: Rotavirus, electrophoretypes, diarrhoea, children.
RESUMEN.

CAMBIO EN LA PREVALENCIA DE LOS ROTAVIRUS DE PATRÓN CORTO Y LARGO AISLADOS DE HECES DE NIÑOS EN MERIDA, YUCATAN, MEXICO. Los rotavirus son los agentes etiológicos virales más importantes de la diarrea infecciosa aguda. Estudios longitudinales han demostrado cambios en la predominancia de los patrones electroforeticos en una misma región. Todos los reportes consignan que el patrón electroforético largo es el predominante sobre el patrón electroforético corto.

De enero de 1985 a diciembre de 1990 se obtuvieron 827 muestras fécales de niños con diarrea y que fueron atendidos en el Hospital General O’Horán en Mérida, Yucatán. Todas las muestras fueron examinadas por la técnica de electroforsis en geles de poliacrilamida y teñidas en nitrato de plata. La edad promedio de los pacientes fue de 12 meses. 536 pacientes fueron hospitalizados y 291 fueron atendidos en la consulta externa.

La prevalencia del patrón electroforético largo fue mayor que el patrón corto en los cuatro años iniciales del estudio (relación 9:1). Pero, durante los últimos dos años del estudio (1989-1990) los patrones electrofotéticos corto y largo fueron identificados en la misma proporción. La importancia biológica de este cambio en la prevalencia de los patrones electrofotéticos es desconocida.

INTRODUCTION.

Rotaviruses are the most important causal agents of acute diarrhea diseases (ADD). Human rotaviruses (HRV) represent a heterogeneous set of viruses that are currently classified into groups, subgroups, and serotypes according to their antigenic traits (1,2) and electrophoretotypes based on studies of the viral genomic RNA profiles obtained by polyacrylamide gel electrophoresis (3,5). Numerous studies have shown that within a community a particular electropherotype can be predominant, but the electropherotypes can be different predominant in separated communities. Also, longitudinal studies have revealed changes in the pattern of the predominant electropherotype in the same region. All the reports regard that the long electropherotype pattern is encountered more predominant than the short electropherotype (6-10).

In this paper we report the increase in frequency of the short electropherotype patterns in a hospital of Merida city in Yucatan Mexico during the period 1985-1990.

MATERIALS AND METHODS.

Patients and samples.

From January 1985 to December 1990 fecal samples taken from 827 children suffering ADD and attending at the General Hospital O’Horan in Merida, Yucatan, Mexico, were studied to determine the presence of rotaviral RNA. All the children were of low socioeconomic stratus (entry equal or less to four dollars by family and by day) The median of their ages were of 12 months (range from newborn to 7 years old). Of this group 536 patients were hospitalized, whereas the remaining 291 children were examined in the outpatients’ clinic. All patients were studied within the first five days from onset of the diarrheal syndrome.

Electrophoresis of rotaviral RNA.

Polyacrylamide gel electrophoresis was carried out by the method of Laemmli (11) in 10% acrylamide slab gels with a 4% acrylamide stacking gel. Separations were performed for 24 h at a constant current of five milliamperes. Gels were stained with silver as described previously (12). Data were analyzed by the X² test.
RESULTS.

Rotaviruses were detected in 150 (28%) of 536 hospitalized children with ADD and in 29 (10%) of 291 patients examined in the outpatients' clinic. The difference observed between the two groups is significant (p<0.0001). The Table I shows the nutrition status of the children. It was different in relationship to the site where the patients were attending. So, 259 (89%) of the children in the outpatients' clinic had normal body weight and only 254 (47%) of the hospitalized patients had this condition (p<0.0001).

Within the six years of the study short and

<table>
<thead>
<tr>
<th>SITE</th>
<th>NBW</th>
<th>MALNUTRICION</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatients' clinic</td>
<td>259</td>
<td>32 (11%)</td>
<td>291 (100%)</td>
</tr>
<tr>
<td>Emergence room</td>
<td>254</td>
<td>282 (53%)</td>
<td>536 (100%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>513</td>
<td>314 (38%)</td>
<td>827 (100%)</td>
</tr>
</tbody>
</table>

NBW = normal body weight

TABLE II

Distribution of the patients during the study and in relationship to electrophoretic patterns.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>LONG PATTERN (%)</th>
<th>SHORT PATTERN (%)</th>
<th>TOTAL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>26 (89.65)</td>
<td>3 (10.35)</td>
<td>29 (100)</td>
</tr>
<tr>
<td>1986</td>
<td>22 (91.66)</td>
<td>2 (8.33)</td>
<td>25 (100)</td>
</tr>
<tr>
<td>1987</td>
<td>41 (91.11)</td>
<td>4 (8.89)</td>
<td>45 (100)</td>
</tr>
<tr>
<td>1988</td>
<td>35 (92.11)</td>
<td>3 (7.89)</td>
<td>38 (100)</td>
</tr>
<tr>
<td>1989</td>
<td>17 (51.51)</td>
<td>16 (48.49)</td>
<td>33 (100)</td>
</tr>
<tr>
<td>1990</td>
<td>5 (50.00)</td>
<td>5 (50.00)</td>
<td>10 (100)</td>
</tr>
<tr>
<td>1985-1990</td>
<td>146 (81.56)</td>
<td>33 (18.44)</td>
<td>179 (100)</td>
</tr>
</tbody>
</table>
long electrophoretotypes could be identified. The prevalence of the long electrophoretic patterns was bigger than the short pattern in the four initial years of the study (relation 9:1). In different form, during the two last years of the study (1989-1990) the long and the short pattern were identified in equal prevalence (Table II).

DISCUSSION.

The frequency of the RVH infection of 29% that we found in hospitalized children with ADD is less than the frequency reported previously in this region (12). It’s important to show that the previous report only included one year of observation and this report the time of the study was six years.

The RVH were detected with more frequency in the hospitalized patients (29%) than among the outpatients (10%). These different frequencies can be explained, in part, by the nutritional status of the patients. The malnutrition conditions were more frequently detected among the hospitalized patients (53%) than the patients attends as outpatients (11%). So, we suppose that the RVH infection is more intense among the children with malnutrition.

Another finding in our study was the increase of the frequency of the short electrophoretotype pattern. Between 1985 and 1988, the percentage of isolation of the short electrophoretotype pattern was low (between 8 and 15%). However, starting from 1989, this frequency increased to 50% and remained in this percentage in 1990. This frequency was not in relation with some change in the environmental of the region. On the other hand, we didn’t find changes in the clinical pictures of the patients in association with the prevalence of RVH with short pattern. The biological significance of this unusual change of electrophoretic pattern is still unknown.

ACKNOWLEDGMENTS.

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