AN OUTBREAK OF SHIGELLOSIS IN AN ULTRA-ORTHODOX JEWISH COMMUNITY

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Abstract—An outbreak of Shigellosis due to Shigella sonnei, S. flexneri and S. boydii in an ultra-religious Jewish community in Southern Israel is described. The source of epidemic was traced to vegetables bought from a single source.

The importance of epidemic and endemic modes of spread of Shigella is discussed.

EXODUS XXIII, 8:10, 11

"And six years thou shalt sow thy land, and gather in the increase thereof: but the seventh year thou shalt let it rest and lie fallow, that the poor of thy people may eat; and what they leave the beast of the field shall eat"

HISTORY OF THE OUTBREAK

During January 1980, 13 cases of diarrheal disease due to Shigella infection were reported among the pediatric population of Ofakim a town with approx. 12,000 inhabitants located in the northern Negev. Shigella sonnei was isolated from the feces of 9 cases, and S. flexneri from 4 cases. The age breakdown of the cases is presented in Table 1.

All cases from a small area of the town, inhabited almost entirely by strictly orthodox religious Jews. Further investigation revealed that all fruit and vegetables consumed during the period of the outbreak had been purchased in bulk from Arab merchants in the area of the Gaza strip. The reason for this was a law in the Jewish religion declaring every seventh to be a sabbatical year for agriculture, where fields must lie fallow. Strictly observant Jews do not consume agricultural produce which may have been cultivated on Jewish land during this period, and therefore purchase their produce from definite non-Jewish sources, in this case in the Gaza strip.

Bacterial cultures were subsequently taken from samples of vegetables from the dealer concerned and S. flexneri was grown from both tomatoes and eggplants, and suspected in celery.

Table 1. Age breakdown of cases of Shigella enteritis outbreak

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 months</td>
<td>0</td>
</tr>
<tr>
<td>13 months-4 yr</td>
<td>9</td>
</tr>
<tr>
<td>5-9 yr</td>
<td>1</td>
</tr>
<tr>
<td>10-14 yr</td>
<td>2</td>
</tr>
<tr>
<td>Not known</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>

A program of intensive health education of the population involved was immediately undertaken, involving appropriate washing of fruit and vegetables, and personal and general hygiene measures. Following this program 8 isolates of Shigella were reported in the following month (February)—4 with S. sonnei, 3 with S. flexneri and 1 with S. boydii; 2 cases of S. flexneri were detected in March 1980.

DISCUSSION

Shigella organisms remain a major cause of gastrointestinal illness in Israel. Most episodes of non-explosive Shigella infection occur by close person-to-person contact involving contaminated hands, foods and fomites. In contrast to S. typhi, enterotoxigenic E. coli or V. cholerae, very few Shigella (1 x 10^2-1 x 10^3) organisms need to be ingested to cause clinical illness; thus spread by contact with interposition of a vehicle such as food, water or milk to amplify the infectious dose is relatively simple [1].

Although in the more developed countries, Shigellosis more often is endemic, contact spread disease primarily affecting children under the age of 10 years, epidemic Shigellosis is still regularly described. Such epidemics may involve faulty water supply of sewage [2] or contamination of foods such as pies, milk, cheese and watercress [3].

In underdeveloped countries, especially in the tropics, outbreaks have been ascribed to primitive or absent methods of disposal of feces, with drinking water and food becoming readily contaminated [3]. However, although the organisms may live for prolonged periods in food and water under determined conditions, they do not survive long after drying. Moreover, isolation of Shigella in fresh raw vegetables before cooking or handling is almost unknown in the medical literature connected with Shigella outbreaks.

The outbreak described here probably occurred due to a combination of endemic and epidemic factors. The religious community involved lives in close contact with each other, most families have
more than three children and the younger children are almost all in day-care centers for most of the day, starting from as early as 6 months of age. Thus possibilities for person-to-person contact and spread of the disease are high.

The isolation of S. flexneri from purchased vegetables at a common source would seem to indicate a way of spread for epidemic Shigellosis. Human sewage is still used in agriculture in areas of the Gaza Strip [4] despite marked improvement in sanitation over the last few years. Flies were probably not a vector, as the outbreak took place in the middle of winter. The fact that three Shigella species—S. flexnerii, S. sonnei and S. boydii were isolated in the epidemic, would support the theory that human sewage supplied an ongoing inoculum to the vegetables grown in the area. It is interesting that 9 of 23 cases of Shigella seen during 3 months in this outbreak were due to S. flexnerii, and that this was the only species grown from the vegetables. Christie has shown that in Britain, S. flexneri had become relatively rare, with S. sonnei the dominant species of Shigella in 1968 [3]. Reller et al. showed that in America too, S. sonnei had become the most common isolate in 1968 [5]. Similar findings were reported in U.S.A. more recently by other authors [6-8] and the same was found by Levin in Israel [9]. Shigella may still cause significant morbidity, despite a decrease in incidence in developed countries. It may be suspected by clinical features or fecal leucocytes, with definitive diagnosis by stool culture [10].

This outbreak demonstrates the important role of Primary Care services in identifying health risks in the community. Familiarity of the Primary Care team with the social and cultural habits of the community enabled the establishment of a community-based diagnosis of Shigellosis.

This is the first report of an outbreak of acute gastroenteritis in an ultra-orthodox Jewish ('haredi') community in Israel.

REFERENCES