Campylobacter fetus subsp. jejuni as a Cause of Gastroenteritis in Jakarta, Indonesia

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Campylobacter fetus subsp. jejuni was isolated from the feces of 15 out of 144 (10%) children (0 to 9 years old) and 4 out of 251 (2%) adults with gastroenteritis and was found together with another enteric pathogen in 2 of the children and in all 4 adults. It was isolated from 2 out of 7 (28%) children and 3 out of 160 (2%) adults with suspected typhoid fever. The bacterium was recovered from 3 out of 4 orphanage children with diarrhea and from 1 without symptoms and was isolated from only 1 child in a control group of 221 persons.

Gastroenteritis, especially among children, is a major disease in Indonesia. Komalarini et al. (9) reported that 30% of hospitalized pediatric patients during 1974 to 1976 suffered from this illness. A bacterial pathogen was isolated from only 43% of these patients. In Ujung Pandang, South Sulawesi, the annual attack rate of gastroenteritis was found to be 98% in children <1 year old, 62% in those 1 to 4 years old, 40% in those 5 to 9 years old, and 16% in those 10 to 14 years old (3). Recognized bacterial etiological agents were isolated from approximately 28% of these patients.

None of these studies included attempts to isolate Campylobacter fetus subsp. jejuni, now known to be a cause of gastroenteritis, especially in the pediatric age group. However, investigators in England (13), Africa (2, 4), Brussels (10), and Sweden (1, 6) found C. fetus subsp. jejuni as the cause of 3 to 30% of all bacterial-caused gastroenteritis in hospitalized pediatric patients.

Most of the children in Sweden from whom the bacterium was isolated came from Asia as adopted children.

We report here the prevalence of C. fetus subsp. jejuni among some children and adults in Jakarta, Indonesia.

MATERIALS AND METHODS

Patients and control group. Outpatients seeking medical attention from July to October, 1979, were evaluated by the medical staff at the Infectious Disease Hospital, Tanjung Priok, Jakarta, Indonesia. Patients complaining of abdominal pain or diarrhea or both were placed into the gastroenteritis group (395), and those with sustained fever for at least 5 days were placed into the febrile illness group (167). Additionally, specimens from a group consisting of 42 orphans (0 to 6 years old) in 1 orphanage and 221 healthy control persons living near the hospital were cultured for the presence of C. fetus subsp. jejuni. The latter group consisted of 68 children (0 to 9 years old) and 153 adults, and none had a prior history of gastroenteritis or fever within 3 months before our study.

Microbiological procedure. Two rectal swabs were collected from each person and placed into Amies transport medium (Difco Laboratories, Detroit, Mich.). Additionally, 3 ml of blood was drawn from hospitalized patients and added to 15 ml of 10% oxgall medium (8) to selectively culture salmonellae. All specimens were transported to the laboratory within 2 h of collection.

One rectal swab was used to inoculate MacConkey, deoxycholate-citrate-lactose-sucrose, thiosulfate-citrate-bile salts, and salmonella-shigella agar (Difco) media. It was then put into alkaline peptone water (pH 8.5) for Vibrio cholerae enrichment. The second swab was used to inoculate a Campylobacter-selective medium (13) consisting of 5% sheep blood–Trypticase (BBL Microbiology Systems, Cockeysville, Md.) soy agar medium (BVTP) containing, per liter, 10 mg of vancomycin, 5 mg of trimethoprim lactate, and 2,500 IU of polymyxin B antibiotic supplement (Oxoid Ltd., London, England). The swab was then put into manganl selenite Salmonella enrichment broth (7). All cultures except the BVTP were incubated for 18 to 24 h at 37°C. The BVTP cultures were incubated for 48 h at 42°C in an atmosphere of approximately 5% oxygen–10% carbon dioxide–85% nitrogen obtained with a GasPak (BBL Microbiology Systems, Cockeysville, Md.) system without a catalyst. At the end of the incubation period the alkaline peptone water was subcultured to thiosulfate-citrate-bile salts medium, and the manganl selenite Salmonella enrichment broth was subcultured to MacConkey, deoxycholate-citrate-lactose-sucrose, and salmonella-shigella agar media. All blood cultures were subcultured daily through 8 days to MacConkey, deoxycholate-citrate-lactose-sucrose, and salmonella-shigella agar media.
V. cholerae-like colonies on thiosulfate-citrate-bile salts medium were subcultured to Kligler iron agar and lysine iron agar slants (Difco). Growth from the Kligler iron agar slant was tested for oxidase activity, agglutination with V. cholerae 01 antiserum (Difco), and polymyxin B (50 U) (Difco) susceptibility. Salmonella-Shigella-like colonies were subcultured to Kligler iron agar, lysine iron agar, motility-indole-ornithine, and urea agar media (Difco). Growth from the Kligler iron agar in the four-tube screen with a Salmonella or Shigella pattern was tested against group-specific antisera (Difco).

Growth from the BVTP plates was tested for rapid, tumbling motility; ability to reduce nitrates in nitrate broth (Difco); sensitivity to nalidixic acid; >20-mm zone diameter (30-μg disk; AB Biodisk, Sweden); oxidase and catalase activity; microaerophilic growth in thioglycolate broth (Difco) and BVTP medium; and Gram stain morphology.

RESULTS

Gastroenteritis patients. C. fetus subsp. jejuni was isolated from the feces of 19 of the 395 (5%) gastroenteritis patients at the Infectious Disease Hospital (Table 1). However, 15 of the 19 (79%) isolates were from 144 children under 10 years old. This represented a C. fetus subsp. jejuni prevalence of 10% in this age group. V. cholerae was isolated from 178 (45%) of the patients, and Salmonella was isolated from 29 (7%) of the patients. The Salmonella included 17 isolates of Salmonella oranienburg, 4 of Salmonella paratyphi-B, 2 of Salmonella javiana, 2 of Salmonella infantis, 3 of Salmonella seftenberg, and 1 of Salmonella typhi.

C. fetus subsp. jejuni was isolated along with another pathogen from 2 of the 15 children. One of the pathogens was V. cholerae, and the other was S. typhi. In adults, on the other hand, V. cholerae was isolated along with all four C. fetus subsp. jejuni isolates. Similarly, 11 out of 28 Salmonella isolates were paralleled by the isolation of V. cholerae.

Febrile illness patients. C. fetus subsp. jejuni was isolated from 2 out of 7 (28%) children (0 to 9 years old) and 3 out of 160 (2%) adults suspected of having typhoid fever (Table 2), whereas S. typhi was found in 72 (43%) of the patients. In one instance both species were isolated in combination from a 17-year-old patient.

Orphanage children. C. fetus subsp. jejuni was isolated from three out of four children with gastroenteritis and from one without symptoms. The asymptomatic child was a twin of one ill patient. All C. fetus subsp. jejuni-positive children were in the 0- to 3-year-old age group. S. oranienburg was also isolated from the feces of one other child without symptoms.

Control group. C. fetus subsp. jejuni was isolated from only 1 4-year-old child in the control group of 221 persons. However, Salmonella spp. were isolated from six of the adults.

DISCUSSION

The main part of the present study was carried out on specimens from patients at the Infectious Disease Hospital in Tanjung Priok. Most of the patients in this hospital are admitted in a serious clinical condition. Even so, it is surprising that V. cholerae was isolated from as many as 45% of the gastroenteritis patients and that S. typhi was isolated from 43% of patients with undiagnosed severe febrile illness.

It is noteworthy that in the group of patients with severe gastroenteritis C. fetus subsp. jejuni was found in 15 out of 144 (10%) children in the 0- to 9-year-old age group, approximately as often as Salmonella spp. If the gastroenteritis and fever patients are added for this age group the corresponding figure is 17 out of 151 (11%), and C. fetus subsp. jejuni was the only pathogen isolated from 15 of the 17 (88%) patients. Above this age 5 out of 7 (71%) patients infected with C. fetus subsp. jejuni were also infected with another pathogen. This may indicate that a simultaneous infection with more than one pathogen is common among adults. Considering the degree of pollution of surface waters in Jakarta reported by Gracey et al. (5), such a mechanism is possible in large groups of the population. Similar risks are also present for food-borne infections for large parts of the population (unpublished data). It might, however, indicate that an infection with one pathogenic microorganism

<table>
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<tr>
<th>Age (yr)*</th>
<th>No. of isolates of:</th>
<th>No. of negative isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V. cholerae</td>
<td>Other Vibrio sp.</td>
</tr>
<tr>
<td>0-9 (144)</td>
<td>42</td>
<td>3</td>
</tr>
<tr>
<td>10-19 (58)</td>
<td>36</td>
<td>2</td>
</tr>
<tr>
<td>≥2 (193)</td>
<td>100</td>
<td>12</td>
</tr>
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</table>

* Numbers in parentheses represent the total number of patients in each age group.
may increase the risk for infection with another. In similar studies, the dominating symptoms were those of gastroenteritis. However, in five of our patients the clinical picture suggested typhoid fever rather than gastroenteritis.

The survey in the orphanage was too small to allow any general conclusions. The fact that three out of four children with mild diarrhea were found to excrete *C. fetus* subsp. *jejuni* indicates that the microorganism may be a common cause of gastroenteritis in Indonesia.

The culture results from the control group showed that the carrier rate in healthy persons is probably low.

**ACKNOWLEDGMENTS**

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**LITERATURE CITED**


**Table 2. Bacteriological findings from 167 febrile illness patients at the Infectious Disease Hospital, Tanjung Priok, Jakarta**

<table>
<thead>
<tr>
<th>Age (yr)*</th>
<th>No. of isolates of</th>
<th>No. of negative isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>V. cholerae</em></td>
<td><em>Other Vibrio sp.</em></td>
</tr>
<tr>
<td>0-9 (7)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10-19 (44)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>≥20 (116)</td>
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<td>0</td>
</tr>
</tbody>
</table>

* Numbers in parentheses represent the total number of patients in each age group.