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INTRAFAMILIAL OUTBREAK OF YERSINIA PSEUDOTUBERCULOSIS INFECTION

(Yersinia/appendicitis)

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We report two brothers with Yersinia tuberculosis type IVB infection. The younger brother was hospitalized with severe ileocecalgia and vomiting, and was operated on under the diagnosis of acute appendicitis. Yersinia appendicitis was diagnosed after resection of appendix, cultivation of the stool specimen and examination of agglutinin titration of the serum against Y. pseudotuberculosis type IVB. Seven days after his operation, his older brother was admitted with symptoms of headache, fever, nausea vomoting and erythema. The Stool culture confirmed Y. pseudotuberculosis infection.

Surgeons should keep in mind that, in some cases, appendicitis can be due to pathogenic infection by the Yersinia bacteria.

CASE REPORT

Case 1. A six y/o boy had a sudden onset of fever (39.3°C) and vomiting 4 days before admission. He was treated initially with antibiotics (CEX 600 mg/day, p.o.) under the care of his family doctor. As severe abdominal pain developed, he was admitted to the Department of Pediatrics, Shimane Medical University Hospital on Jan. 10.

On admission, palpation of his flat abdomen showed muscular defence and rebound tenderness. His body temparature was 37.4°C and white blood cell count (WBC) was 16400/mm^3. The test for

Table I. CHARACTERISTICS OF Y.PSEUDOTUBERCULOSIS

Characteristics	Reaction	Characteristics	Reaction
Motility	-	Acid production from:	
Urease	+	Cellobiose	-
Ornithine decarboxylase	-	Sucrose	-
Indole test	-	Glucose	+
Voges-Proskauer test	-	Trehalose	+
Utilization of Citrate	-	Rhamnose	+
		Melibiose	+
		Sorbose	-
		Sorbitol	-
		Raffinose	-

Table II. STOOL CULTURE OF Y. PSEUDOTUBERCULOSIS AND AGGLUTININ TITER

	11/Jan	21/Jan	25/Jan	28/Jan	4/Feb
Case 1	(+)/N.T.	(+)/×640	(+)/N.T.	(-)/×160	
Case 2		(+)/<×20		(+)/<×20	(-)/N.T.
Mother		(-)/<×20			
Sister		(-)/<×20			
Grand-father		(-)/<×20			
Grand-Mother		(-)/<×80			

Remarks: Numerator; isolation of Y.Pseudotuberculosis
Denominator; agglutinin titer of the serum
N.T.; not tested

occult blood in the stool was positive, however, there was no episode of diarrhea for 4 days prior to his operaion, which was performed under the diagnosis of acute appendicitis. During the operation, inflamation of the appendix and terminal ileum was noted as was swelling of the mesenteric lymph nodes. An appendectomy and lymph node biopsy were performed. He was discharged 9 days after the operation. Yersinia pseudotuberculosis type IVB was isolated from three consecutive stool cultrues (Jan. 11, Jan. 21 and Jan. 25) with the highest serum agglutinin titer of 0 antibodies (1:640) (Tables I and II). The results of the histological examination were reported as early acute appendicitis and so-called sinus catarrh of the lymph nodes.

Case 2. A ten y/o boy, an older brother of case 1, was admitted to the Department of Pediatrics on Jan. 21 for the chief complaints of headache, high fever, nausea, vomiting and a generalized erythematous rash. Yersinia infection was suspected because of the apparrent clinical features and his family history.

His hemoglobin level was 12.8 g/dl, WBC count 8700/mm^3, erythrocytic sedimentation rate 26mm in 1 hr. and an apparently normal stool specimen showed up positive for occult blood. Two consecutive stool cultures revealed Y. pseudotuberculosis type IVB, however, the maximum agglutinin titer of the serum was within the normal limit.

His symptoms disappeared with antibiotics (FOM 4g/day, d.i.v.) and he was discharged from the hospital after four days. Three weeks later, however, he complained of bilateral knee and wrist pains which required treatment by the orthopedic department.

Other members of the family showed negative results on stool cultures and serum agglutinin titers except for his grandmother, who showed a serum agglutinin titer of 1:80 which is upper normal with respect to Yersinia infection (Table II).

Table III. PATHOGENIC BACTERIA FROM STOOL CULTURE IN PEDIATRIC DIARRHEA (1983)

Bacteria	Shimane Med. Univ.	Fukami et al.
Campylobacter	13.6%	15.1%
Salmonella	1.8%	2.4%
Pathogenic E.coli		0.6%
Yersinia	2.7%	0.7%
Klebsiella		1.5%

DISCUSSION

Commonly, the term Yersinia infection is used for both infection by Y. enterocolitica and Y. pseudotuberculosis. The clinical manifestations are gastrointestinal infection, terminal ileitis, appendicitis, mesenteric lymphadenitis, nodular

erythema, polyarthritis and septicemia.

Studies on human Yersinia infection have been carried out only recently partly due to the characteristics of Yersinia, which grows not only in a low temparature environment (25°C) but also at a slow rate. Yersinia infection is receiving more attention recently because a small but significant number of cases of intestinal infection in children are reportedly being caused by this bacteria in Japan (1). At our hospital, Yersinia species have been isolated from stool in cases of infantile intestinal infection with an incidence of 2.7% (Table III). Fukami et al. (2) reported Yersinia infection with an incidence of 0.7% (Table III). Spread of the infection is thought to be by the oral route from direct contact with infected animals such as pigs, dogs, and cats or by ingesting water and/or food contaminated by the bacteria. Therefore, there is a high possibility of group infection. In Japan, there are reports of not only mass outbreak involving 9 cases but also 3 intrafamilial outbreaks (3,4,5). In our cases, the patients and the family members are rural inhabitants. Though they were not drinking well water, they did have a pet cat, which was thought to be the possible source of infection.

Concerning appendicitis, 5-6% of all appendicitis cases are reportedly due to Yersinia infection (6). Fukushima et al. (5) reported a case of intrafamilial outbreak of Yersinia appendicitis. The differential diagnosis among ileocecalgia due to appendicitis, terminal ileitis and/or mesenteric lymphadenitis is difficult sometimes. Vantraphen et al. (7) reported on the value of radiographic examination in diagnosing terminal ileitis showing ulcerations, filling defects, coarse folds, and nodules or granules in the mucosa of the terminal ileum.

We believe that laparotomy may be indicated where appendicitis is suspected in children since pediatric appendicitis progresses rapidly to perforation and because of the possibility of Yersinia appendicitis. An operation was avoided in the second case due to the absence of ileocecalgia and because the patient's younger brother was diagnosed as having Yersinosis.

Our conclusion is that children with ileocecalgia should be treated bearing in mind not only the possibility of acute appendicitis but also enteritis or mesenteric lymphadenitis due to Yersinia.

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