BRIEF COMMUNICATION

Campylobacter ileocolitis: an inflammatory bowel disease

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Campylobacter jejuni/coli,[1] also known as *C. fetus* ss. *jejuni*[2] or "a related vibrio",[3] has lately been recognized as a common cause of bacterial diarrhea.[4-7] In their recent review Karmali and Fleming[8] discussed in detail the historical background as well as the clinical and laboratory features of campylobacter-associated diarrhea.

The pathology of this illness remains to be clarified. Both the small intestine and the colon are considered to be involved in the infection.[9-12] Colorectal involvement in patients with campylobacter enterocolitis has recently been studied by Lambert and colleagues,[13] who found that the sigmoidoscopic and histologic features may be indistinguishable from those of other forms of inflammatory bowel disease.

We describe a case of severe *C. jejuni/coli*-associated diarrhea with radiologic involvement of the ileum and transverse colon. Therapy with erythromycin resulted in complete clinical, bacteriologic and radiologic resolution of the illness.

Case report

A 24-year-old woman presented to the emergency department with a 13-hour history of abdominal pain beginning in the epigastrium and moving to the right lower quadrant, in association with nausea and vomiting. She had previously been in excellent health, requiring no medications, and had neither travelled abroad nor been in contact with animals. Two days prior to the onset of symptoms she and three friends had eaten in a Mexican restaurant.

Her oral temperature was 38.6°C. Tenderness was elicited in the right lower quadrant by direct palpation and by rectal examination, and localized rebound tenderness was present. Marked leukocytosis, with an elevated proportion of immature cells, was noted. After several hours of observation the right lower quadrant tenderness and peritoneal signs were persisting. A laparotomy was therefore performed. No abnormality of the surface of the ileum or colon was present, and a normal appendix was removed. Postoperatively the lower abdominal pain and fever continued.

On the third hospital day watery diarrhea was noted; 20 brown bowel movements were passed in 24 hours. The next day the stools became bloody. Sigmoidoscopic examination showed mucosal edema. Initial treatment with diphenoxylate hydrochloride was unsuccessful. On the sixth hospital day swallowing became painful and oral candidiasis was diagnosed; treatment was with nystatin. No change in the frequency of bowel movements occurred despite symptomatic improvement of the moniliasis.

The erythrocyte sedimentation rate was 150 mm/h (by the Westergren method). The leukocyte count was 18.6 × 10^9/l (63% neutrophils, 27% band cells, 7% lymphocytes, 2% eosinophils and 1% basophils). Examination of fresh stool by phase-contrast microscopy revealed small, motile, spiral and S-shaped bacteria characteristic of the *Campylobacter* genus. Stool cultures were initially positive for *Candida albicans* and *C. jejuni/coli*; later, after nystatin therapy but prior to treatment with erythromycin, cultures were positive for *C. jejuni/coli*. Antibiotic susceptibility tests were carried out by the agar dilution method, as described by Karmali and Fleming.[6] The minimum inhibitory concentration of erythromycin, tetracycline and gentamicin was less than 1 μg/ml for the *C. jejuni/coli* from our patient. All cultures were negative for *Yersinia*, *Salmonella* and *Shigella*. No ova or parasites were seen by microscopic examination of the stool, and blood cultures were negative. Serologic tests for campylobacter were performed with a serum bactericidal assay[6] and a tube agglutination test.[1] The bactericidal antibody titres were found to be 4 and 16 and the agglutination titres 128 and 128 in paired serum samples obtained 7 days and 21 days respectively after the onset of symptoms. Serologic tests for *Yersinia* were negative. Roentgenographic examination following a barium enema revealed multiple aphthoid ulcers of the large bowel, most pronounced in the transverse colon (Fig. 1). Distal ileal edema and ulcerations were also noted (Fig. 2). The radiologic appearance was

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highly suggestive of Crohn's disease.

Skin tests were positive with streptokinase–streptodornase, mumps antigen and *Candida* antigen in a dilution of 1:100. E-rosette formation (an indication of the percentage of thymus-derived [T-] lymphocytes) and proliferation of T-lymphocytes in vitro when cultured with phytohemagglutinin, concanavalin A and *C. albicans* were normal. Quantitative immunoelectrophoresis showed slight elevation of the serum IgE concentration. *Candida* precipitins and salivary IgA were present.

A 2-week course of erythromycin stearate, 500 mg every 6 hours given orally, was begun on the 13th hospital day. Marked clinical improvement followed, with complete resolution of the diarrhea and abdominal pain within 48 hours. Stool cultures after 2 days of treatment were negative for *C. jejuni/coli* and remained negative after the cessation of therapy. During the second day of erythromycin therapy erythema nodosum appeared on the woman's legs, but it disappeared spontaneously despite continuation of the antibiotic therapy. Six weeks after the onset of symptoms repeat radiologic evaluation of the gastrointestinal tract yielded entirely normal findings.

Two days after the patient's emergency admission and laparotomy a mild clinical illness compatible with *C. jejuni/coli* enteritis developed in the three friends with whom the woman had eaten in the Mexican restaurant. The diagnosis was confirmed by stool culture in two of the friends and serologically (because no stool specimen was available) in the third.

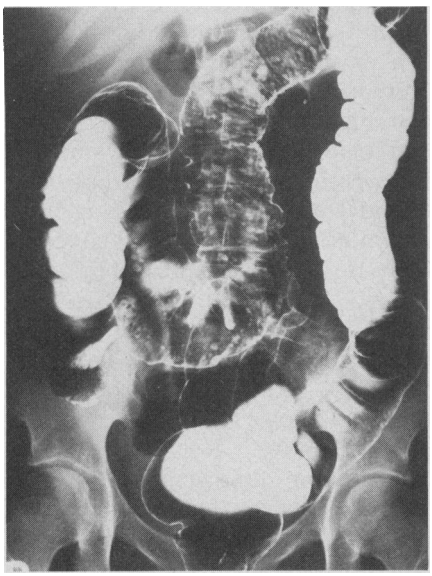

FIG. 1—Multiple aphthoid ulcerations of large bowel, most prominent in transverse colon.

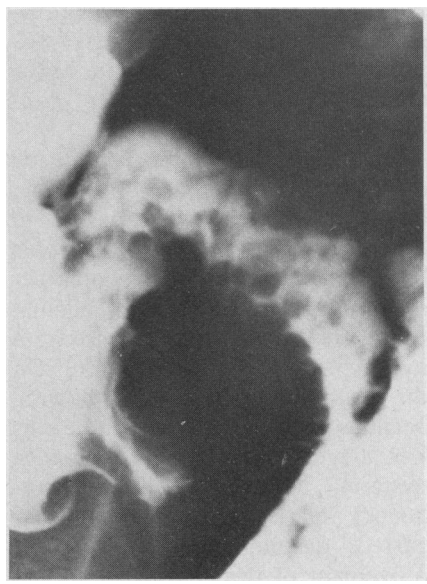

FIG. 2—Mucosal edema and ulceration in distal portion of ileum.

Discussion

Our patient presented with the characteristic features of campylobacter enteritis: lower abdominal pain, fever and bloody diarrhea. Several factors suggested that the illness was due to *C. jejuni/coli*. First, the presence of this organism in the stools during the acute phase of the illness is known to be closely associated with disease.[4,6,7] Second, there was a clustering of cases. Symptoms appeared in three persons who had shared a restaurant meal with our patient a few days earlier. It has been stated that the reservoir of campylobacter is in animals and poultry.[9,14,15] The appearance of the symptoms in all four individuals at about the same time suggested a common source of infection within the known incubation period of campylobacter enterocolitis.[8] Third, erythromycin therapy led to rapid disappearance of the organism from the patient's stool and was associated with rapid clinical and radiologic improvement. Significant serologic responses often develop in persons with campylobacter enterocolitis.[6,7] Although a fourfold rise in the bactericidal antibody titre was evident in our patient, the antibody levels were very low. The significance of this is not clear, although it may be that the antibiotic therapy depressed the patient's antibody response, as it is known to do in other infections.[16]

Radiologic evaluation in this case demonstrated ulceration of the ileum and transverse colon. A similar radiologic appearance may be seen in Crohn's ileocolitis and with infections due to *Yersinia*, *Salmonella* and *Shigella* involving the bowel.

Erythema nodosum is a common feature of inflammatory bowel diseases: it is seen in 5% of cases of Crohn's disease and 30% of cases of yersiniosis.[17] Our case suggests that erythema nodosum may also be a feature of campylobacter enterocolitis, though this has not previously been recognized.

We are unclear as to the significance of the moniliasis in our patient. Although *C. albicans* can cause lesions of the small and the large intestine, such involvement usually occurs when the host defences are compromised.[18] In our patient there was no evidence of impaired immunity or any other serious underlying disorder.

Recent reports suggest that *C. jejuni/coli* infection is a common cause of diarrhea in adults,[5] and in a large pediatric series it was one of the pathogens most frequently isolated.[6] Because of the prevalence of this infection and the ease with which it can be diagnosed and treated, it must be sought in all cases of diarrhea. Abdominal pain is a common feature of campylobacter enterocolitis, and it occasionally precedes the onset of diarrhea.[6] Thus, the patient may first present to a surgical unit with features of an acute abdomen, as in the case we have described. In adults specific inflammatory bowel diseases due to *Yersinia*, *Salmonella* and *Shigella* are well recognized but account for only a small percentage of cases of diarrhea in large medical centres. *C. jejuni/coli* should now also be considered as a cause of specific inflammatory bowel disease.

Studies of the patient's immune status were performed by Dr. E.W. Gelfand, department of immunology, the Hospital for Sick Children, Toronto. We

thank Dr. I.H. Koven, department of surgery, Mount Sinai Hospital, for allowing us to study his patient.

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BOOK REVIEWS

Antiviral Agents and Viral Diseases of Man. Edited by George J. Galasso, Thomas C. Merigan and Robert A. Buchanan. 819 pp. Illust. Raven Press, New York, 1979. Price not stated. ISBN 0-89004-222-5

I found "Antiviral Agents and Viral Diseases of Man" to be up to date, accurate, highly informative, readable and well illustrated. Twenty authors, well known in virologic circles, contributed to the volume, which sets out to review the field of clinical virology and to present in detail current and potential strategies for the control and amelioration of viral diseases.

The first chapter deals with the classification of viruses, their structure and replication. Next comes a description of the pathogenesis of various viral infections and a discussion of the factors involved in host resistance. Chapters 3 and 4 deal with the mode of action and pharmacology of chemotherapeutic agents and immune defences during viral infections respectively. These chapters also consider immunomodulating substances, interferon and interferon inducers; the chapters are packed with detailed information, but they do not make for enjoyable reading.

Dr. Nathalie Schmidt provides an excellent general survey of current progress in the laboratory diagnosis of viral infections. Considerable effort should be directed toward achieving more rapid viral diagnoses while we await new and better antiviral agents. Happily, prospects in this area are encouraging and groups have been formed on both sides of the Atlantic to explore new methods for increasing the speed and efficiency of viral diagnosis.

The next six chapters are more clinically oriented and cover the following topics: ocular viral disease, viral dermatologic diseases, viral respiratory diseases, viral infections of the gastrointestinal tract, viral infections of the central nervous system, and chronic intrauterine and perinatal infections. Each chapter provides information on the characteristics of the viruses involved — clinical features, epidemiology and pathogenesis — as well as on the actual and potential use of antiviral agents.

The need for antiviral agents is greatest in the compromised host. The next 74 pages provide a good account of the problems encountered and ways in which certain viral diseases might be prevented and treated.

The editors complete the book with a well balanced overview entitled "Antiviral therapy today". Their final sentence ends on an optimistic note: "Future generations of physicians will have many more therapeutic tools for managing virus infections than are presently available".

I recommend this text to everyone with an interest in virology, oncology and infectious diseases. Doubtless it will become a good friend to those who plan to sit higher examinations.

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