et al had occult adenocarcinomas of the large bowel.³ An association with neoplasm of the small bowel has not been described. In this case portosystemic shunting and diabetes mellitus may have been additional predisposing factors.

Adenocarcinoma of the ileum is rare in this age group.⁴ Its co-existence with cystic fibrosis may have been a chance happening, but we speculate that a combination of slowed small bowel transit, raised faecal bile acid concentrations, altered bowel flora, and low plasma selenium and vitamin E concentrations, all previously reported in cystic fibrosis, may predispose to the development of gastrointestinal malignancy. Any such predisposition would become more obvious as life expectancy in cystic fibrosis improves.

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Intestinal perforation associated with *Yersinia enterocolitica* infection

Yersinia enterocolitica was first recognised as a pathogen in man in 1939.¹ It is a Gram negative coccobacillus of worldwide distribution and produces a wide range of clinical manifestations.²⁻³ The commonest is a self limiting gastroenteritis, but more serious variants may occur. We describe two patients who required emergency operations for acute abdominal conditions associated with this infection.

Case reports

Case 1—A 7 year old Japanese boy presented with a two day history of abdominal pain, fever, and diarrhoea. On examination he had a fever (38°C) and was dehydrated, and there was tenderness in the left iliac fossa. Gastroenteritis was diagnosed provisionally, and treatment comprised intravenous rehydration. The symptoms continued for seven days, and when blood cultures yielded *Bacteroides fragilis* intravenous gentamicin and metronidazole were started. There was little clinical response, and a laparotomy four days later showed a pelvic abscess secondary to a perforated appendix. After appendicectomy and drainage he made an uneventful recovery. Subsequently an antibody titre of 1/320 against *Y enterocolitica* type O3 was detected in blood obtained on the 10th day of the illness.

Case 2—A 14 year old English girl presented in a critically ill condition. She had been unwell for three weeks with diarrhoea, vomiting, abdominal pain, fever, and weight loss (9.5 kg). Two days before her admission the diarrhoea had suddenly stopped. On examination she had a fever (38°C), was dehydrated, malnourished (plasma albumin concentration 17 g/l), hypotensive and had a tachycardia. The abdomen was massively distended, and an x ray film showed intestinal obstruction. After resuscitation laparotomy showed mechanical obstruction of the small bowel due to an inflammatory mass in the pelvis associated with numerous perforating ulcers in the ileum. A similar mass in the upper abdomen was related to jejunal ulceration. Two resections with primary anastomoses were performed to relieve the obstruction and restore intestinal continuity. Postoperatively, despite total parenteral nutrition and intravenous penicillin, gentamicin, and metronidazole she was critically ill for eight days with persistent fever and ileus. An antibody titre of 1/640 against *Y enterocolitica* type O3 was detected and chloramphenicol substituted for the previous antibiotics. She remained seriously ill for a further 11 days and improved only after the dosage was increased. Eventually she recovered completely and was discharged home

32 days after admission. Throughout the illness all blood cultures were sterile, rectal swabs grew no pathogens, and computed tomography of the abdomen postoperatively showed no localised collections. She received total parenteral nutrition for 26 days and chloramphenicol for 18 days (seven days at high dosage).

Incidence of positive diagnoses of *Yersinia enterocolitica* infection over past decade in United Kingdom. Diagnosis was made by serological examination or isolation from blood, stools, or lymph nodes, or both. (Courtesy of Dr C J Mitchell, Public Health Laboratory Service, Leicester.)

Comment

The antibody titres against *Y enterocolitica*, although measured in only single blood samples, were considered to be diagnostic by the Public Health Laboratory Service in Leicester (the British reference centre for this organism). During 1976-83 only 469 such infections were recorded by the Public Health Laboratory Service, and thus such infection appears to be either rare or underdiagnosed. The mean number of cases recorded each year increased from 18 (SD 9.5) in 1976-9 to 100 (34) in 1980-3 (figure), but whether this reflects an increased incidence or greater awareness of the infection is uncertain. *Yersinia* is more prevalent abroad,^{2,3} but our patients must have contracted the infection within the United Kingdom as neither had been abroad recently.

The risks of yersinia infection are considerable; deaths have been recorded,⁴ and life threatening complications include acute appendicitis,² septicaemia,^{2,3} peritonitis,⁴ and gangrene of the small bowel.⁵ We suggest that yersinia may be a more important cause of acute abdominal conditions than is currently appreciated, and if antibody titres were obtained whenever acute intestinal problems were being investigated many more positive diagnoses would probably be made.

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