

## Localisation of CMV ileitis in patients with AIDS using white cell scanning

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### Introduction

Cytomegalovirus (CMV) is a major cause of gastrointestinal disease in patients with AIDS. Oesophageal and colonic involvement are well recognised and can be diagnosed using endoscopic techniques. However, post mortem studies suggest that small bowel infection by CMV is more common in patients with AIDS than is currently recognised during life (Ives, 1997). We report two cases of CMV ileitis and one case of HIV-1 enteropathy in which white cell scanning was used to define whether and how much of the ileum was affected by CMV infection, and to then follow the response to therapy.

**Case 1:** A 38-year-old HIV-1 positive white man presented with campylobacter and salmonella enteritis, cryptosporidial diarrhoea, candida oesophagitis and *Pneumocystis carinii* pneumonia after a visit to Thailand. He responded to conventional treatment and all pathogens cleared from his stool. His CD4 count was 32/μL. During the course of treatment with co-trimoxazole and zidovudine, his white cell count fell to 0.4 x 10<sup>9</sup>/L.

Nineteen days after admission, he developed fever, vomiting, abdominal tenderness and severe abdominal pain. A plain abdominal x-ray showed dilated loops of small bowel. A <sup>99m</sup>technetium (<sup>99m</sup>Tc) white cell scan was performed using autologous granulocytes which were isolated, labelled and then re-infused (Peters *et al*, 1986; Danpure & Osman, 1988). Gamma camera images over the first 4 hours showed the accumulation of <sup>99m</sup>Tc in the terminal ileum but not in the colon (Figures 1 and 2). A flexible colonoscopy demonstrated normal colonic mucosa and a grossly oedematous ileo-caecal valve. Immunohistochemical stains for CMV antigens of a biopsy from the terminal ileum were positive. Cryptosporidia were also seen. Culture and immunohistochemistry of peripheral blood leucocytes for the early antigen of CMV was positive.

Treatment with paromomycin (White *et al*, 1994) which had been started three weeks earlier resulted in a reduction in the cryptosporidial oocyte count in his stool. However, there was no associated change in his clinical symptoms.

Treatment with foscarnet was now started and this resulted in a resolution of his fever, abdominal pain and small bowel obstruction. A follow-up white cell scan showed no localisation of <sup>99m</sup>Tc to the ileum and the patient remained well on maintenance CMV therapy.

**Case 2:** A 41-year-old HIV-1 positive white man with a CD4 of 10/μL developed diarrhoea. Stool microscopy showed numerous cryptosporidial oocysts but no other pathogens. He was treated with paromomycin with complete resolution of his diarrhoea. Four months later, he developed diarrhoea that became so severe (liquid stools 6-20 times/day) that he required regular hospitalisation over a period of 8 months. Control of his abdominal pain required regular opiate analgesia.

Stool microscopy showed only scanty cryptosporidial oocysts and no other pathogens. Gastric and rectal biopsies were positive for CMV antigens on immunohistochemical staining. A colonoscopy revealed such severe inflammation and ulceration of the transverse colon that the procedure had to be abandoned because of the friable nature of the mucosa and because of contact bleeding. The colonic biopsy showed numerous cryptosporidia and large endothelial cells with nuclear inclusions which were typical of CMV infection. Immunohistochemistry for CMV antigens was positive.

There was no response of the diarrhoea to prolonged treatment with paromomycin, ganciclovir, foscarnet, zidovudine and didanosine. Attempts at symptomatic control of his symptoms with opiates, octreotide and pancreatic enzymes were also unsuccessful. An <sup>111</sup>indium labelled white cell scan was performed. This showed abnormal uptake in a loop of distal ileum, terminal ileum, ascending colon and at the splenic flexure. Surgical resection of his colon and terminal ileum with a functioning ileostomy was followed by a rapid resolution of his symptoms. Macroscopic and microscopic histopathological findings confirmed the presence of CMV ileitis, CMV colitis and of cryptosporidium (Figures 3-5).

**Case 3:** A 46-year-old HIV-1 positive Asian man with a CD4 count of 20/μL was investigated extensively over a period of 2