

# ACQUIRED IMMUNODEFICIENCY SYNDROME AND CRYPTOSPORIDIUM INFECTION

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## ABSTRACT

A child suffering from the acquired immunodeficiency syndrome (AIDS) with intestinal cryptosporidiosis is reported. The child presented with profuse diarrhoea up to 15 episodes a day over a period of one week. Management was with intravenous rehydration and oral spiramycin. Diagnosis of intestinal cryptosporidiosis requires examination of multiple stool specimens by several concentration and staining procedures which aid in the visualisation of the oocysts. In the absence of an effective treatment for cryptosporidiosis, the cornerstone of management is mainly supportive therapy.

**Keywords:** Acquired Immunodeficiency Syndrome (AIDS), cryptosporidium, paediatric

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## INTRODUCTION

*Cryptosporidium* is a coccidian parasite which is taxonomically related to *Toxoplasma* and *Isospora*<sup>(1)</sup>. The two species relevant to humans are *C. parvum* and *C. muris*<sup>(1,2)</sup>.

The organism was first described in 1907, but it was not until 1976 that the first human infection was reported<sup>(1,3,4)</sup>. Thereafter, an association with the acquired immunodeficiency syndrome (AIDS) was described in 1981 and diarrhoeal disease from *cryptosporidia* has since been linked to infection with the human immunodeficiency virus (HIV). In addition, *cryptosporidia* has been associated with biliary and pulmonary diseases in HIV patients. *Cryptosporidia* has a worldwide distribution with a higher prevalence in the underdeveloped world<sup>(1,5)</sup>. In the United States, as much as 15% of HIV patients may be infected by it<sup>(1,6,7)</sup>.

*Cryptosporidium* causes a self-limiting diarrhoeal illness lasting up to three weeks in immunocompetent individuals, while patients with AIDS usually develop a protracted enteropathy.

## CASE REPORT

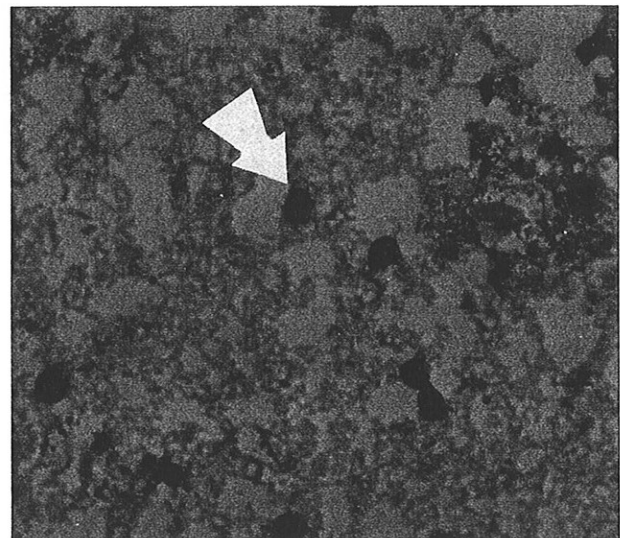
A three-year-old boy was previously seen in an acute general hospital on two occasions. He was first admitted in December 1990 for idiopathic thrombocytopenia which resolved spontaneously. The second admission was in 1991 for pyrexia of unknown origin. He responded to empirical treatment with

intravenous ampicillin and gentamicin.

The child was detected to be HIV positive in November 1991. His parents were diagnosed to be HIV positive in July 1991. He was admitted to the Communicable Disease Centre in March 1992 for complaints of intermittent fever, frequent loose stools, and severe weight loss over a 3-month period. Clinically, the child was pale and dehydrated. Oral candidiasis, hepatomegaly and multiple enlarged cervical and inguinal lymph nodes were noted. His haemoglobin level was 6.5g/l and serum albumin was 23g/l. The CD4 and CD8 counts were  $0.0585 \times 10^9/L$  and  $0.5148 \times 10^9/L$  respectively. Serology and cultures for cytomegalovirus and *Toxoplasma gondii* were negative, and cultures of the marrow, blood and urine revealed no bacterial or mycobacterial growth. Stool samples grew *Campylobacter jejuni*. The child was transfused, rehydrated and treated with oral erythromycin (for one week) and nystatin. He was discharged well after two weeks.

In July 1992, the child was readmitted for recurrence of frequent loose stools for one week associated with poor feeding and vomiting. Numerous cryptosporidial oocysts were seen on microscopy of the stool specimens (Fig 1). The child was rehydrated and treated with spiramycin 0.75 MIU twice daily. Despite the persistent presence of cryptosporidial oocysts seen on follow-up samples of stools, the diarrhoea settled after two weeks of treatment and the child was discharged on maintenance spiramycin. He had improved

**Fig 1 - Cryptosporidial oocysts (arrowed) seen on microscopy with Kinyoun's acid fast stain (x 400)**



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constitutionally with zidovudine and remained clinically stable on outpatient follow-up.

## DISCUSSION

Heterosexual transmission has been gaining increasing importance in Singapore since 1990<sup>(8)</sup>. We believe that this patient is the first case of paediatric AIDS in Singapore acquired through perinatal transmission. His parents had been previously diagnosed to have HIV infection.

A diagnosis of *cryptosporidia* infection can be made by identifying the parasite in stool specimens. This can be done through acid-fast staining or with immunofluorescence techniques. The latter may provide a more sensitive means of detection<sup>(1,9,10)</sup>.

The sensitivity of stool examination is dependent on a number of factors. Firstly, the nature of the stools varies, the organism being less readily detected in formed stools than in watery stools. Secondly, excretion of the parasite is intermittent. As such, repeated specimens may need to be examined before the parasite can be isolated. Generally, three specimens over a 10-day period would allow a reasonable yield<sup>(1)</sup>. Thirdly, the method for concentration of the oocysts in stool specimens is important, standard methods used for helminth eggs being suboptimal<sup>(10)</sup>.

The underlying difficulty in treating cryptosporidiosis is the fact that the exact mechanism of diarrhoea has yet to be clearly elucidated. Postulations put forward include disruption of villi absorption or hypersecretion induced by toxins which have yet to be isolated<sup>(1,11,12)</sup>. Presently, the cornerstone of management of cryptosporidial diarrhoea is fluid replacement and electrolyte balance. Traditional anti-diarrhoea drugs, such as kaolin, loperamide and opiates, as well as newer drugs such as somatostatin analogues may be of use in reducing the severity of disease, but results have been inconsistent<sup>(1)</sup>.

In our case, the child responded to spiramycin. However, clinical experience thus far has been inconclusive with regards to its efficacy. At present, it seems that spiramycin is effective in managing AIDS-related cryptosporidial enteropathy only in the early stages of AIDS, which is the case in our patient<sup>(13)</sup>. In one placebo controlled trial, no clear advantage was found<sup>(1,14)</sup>. Other approaches to treatment recently have

included the use of paromomycin, azithromycin, hyperimmune bovine colostrum, bovine milk globulin and bovine transfer factor<sup>(1,15,16)</sup>.

In summary, this case describes a 3-year-old child with AIDS presenting with chronic diarrhoea due to cryptosporidiosis and responding symptomatically to treatment with spiramycin, despite the persistence of *cryptosporidia* in the stool.

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