

CRYPTOSPORIDIOSIS IN HIV INFECTED PATIENTS IN THAILAND

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Abstract. Diarrhea, mostly chronic diarrhea and weight loss are common in patients with AIDS. *Cryptosporidium* has been identified as responsible for chronic, debilitating secretory diarrhea in HIV infected patients. We performed a retrospective study of the prevalence, clinical features and laboratory findings of cryptosporidiosis in HIV infected patients (adults and children), in the period of 6 years from January 1988 to December 1993 at Bamrasnaradura Hospital in Nonthaburi, Thailand. In this study, *Cryptosporidium* was found in 22 (8.8%) by detection in stool specimens of 250 HIV infected patients with diarrhea and was found throughout the year. The prevalence rates of cryptosporidiosis in this study among children and adults were 19% and 7.9%, respectively. The common features were chronic diarrhea (84.6%), mostly watery diarrhea and weight loss/malnutrition (100%). A few fecal leukocytes were found in 15.4%.

INTRODUCTION

Diarrhea and weight loss are common features in adults and children with acquired immunodeficiency syndrome (AIDS), particularly in developing countries (Pavia *et al*, 1992; Janoff and Smith, 1988; Connolly *et al*, 1989). Many agents, including bacteria, fungi, parasites and viruses have been implicated as causative organisms.

Cryptosporidium species are coccidial protozoans under the phylum Apicomplexa, genus *Cryptosporidium*. *Cryptosporidium* and microsporidia have been identified as responsible for acute and chronic diarrhea in HIV infected patients (Janoff and Reller, 1987; Soave and Armstrong, 1986; Cali and Owen, 1990). Infection results from ingestion of oocysts in contaminated water or through fecal-oral transmission from person to person. The low infectious dose for humans, perhaps fewer than 10 oocysts, facilitates its transmission (Casemore, 1990). Treatment when necessary is supportive, no antibiotic has been consistently effective (Cordell and Addiss, 1994). Antibiotics such as spiramycin and paromomycin have been postulated to be of benefit in treating cryptosporidial diarrhea but their efficacy has not yet to be established. Some studies have suggested of using octreotide, an active derivative of somatostatin in treating it. Few data are available about the relative effectiveness of specific control strategies and most of the recommended control measures are of unproven efficacy. A diarrhea illness caused by cryptosporidia for more than a month has been

designated as AIDS diagnosis by the CDC. We performed a retrospective study to evaluate the prevalence, clinical manifestations and laboratory findings of cryptosporidiosis in HIV infected patients at Bamrasnaradura Infectious Disease Hospital, Nonthaburi in Thailand.

MATERIAL AND METHODS

Bamrasnaradura Infectious Disease Hospital is the referral hospital for treating HIV/AIDS patients in Thailand. This hospital has performed as the inpatient unit for these patients since 1987. The charts of all confirmed cases of cryptosporidiosis in HIV infected patients seen in this hospital during 6 year period from January 1988 to December 1993 were reviewed. A detailed history, physical examination and laboratory results of them were recorded and analysed.

Diarrhea was defined as at least three loose stools during 24 hours: acute lasting hours or days, persistent lasting for 14 days or more and chronic lasting for more than a month. Dehydration was evaluated and graded as some or severe as described by WHO. Weight for age was used as an indicator of nutritional status.

Laboratory analysis

Stool specimens or rectal swabs obtained from the HIV infected patients with diarrhea, based on 1 to 5 stools/subject were sent to detect fecal leukocyte and

red blood cell by fresh smear examination and *Cryptosporidium* by modified Ziehl-Neelsen staining.

RESULTS

Between January 1988 and December 1993, there were 250 HIV infected patients with symptomatic diarrhea, 229 (91.6%) adults and 21 (8.4%) children seen in Bamrasnaradura Infectious Disease Hospital, Thailand. Of the 250 patients 22 (8.8%) (16 male, 4 female and 2 homosexual men) were positive for *Cryptosporidium*. The charts of cryptosporidial diarrhea patients, available in 13 (59.1%) of 22 cases were reviewed.

Laboratory findings

Few fecal leukocytes were observed in 2 (15.4%) of 13 cases. No red blood cell was detected in all stool specimens.

Age distribution

The age distribution of 22 HIV infected patients with cryptosporidiosis (Table 1) had the age range from 3 months to 50 years. *Cryptosporidium* species

were detected in 4 (19%) of 21 children and in 18 (7.9%) of 229 adults.

Seasonality

The 13 cases were seen in almost every month of the year with two peak months in March and July.

Clinical features

The clinical features of the 13 HIV infected patients with cryptosporidiosis are listed in Table 2. Of the 13 cases 11 (84.6%) had chronic diarrhea that persisted more than a month and 2 (15.4%) had acute diarrhea. The number of motions in these patients ranged from 3 to 12 with an average of 7.3 per day. The stools were mostly watery, non-bloody (92.3%). All 13 cases had weight loss/malnutrition (100%) and all 4 children exhibited failure to thrive. The other clinical features were some dehydration (84.6%), fever (46.2%), vomiting (23.1%) and abdominal pain (7.7%). None of the patients had respiratory symptoms. Concurrent infections of the patients in this study were tuberculosis (pulmonary and extrapulmonary) in 5 (38.5%) cases, *Pneumocystis carinii* pneumonia in 3 (23.1%) cases, cryptococcal meningitis and cryptococemia in 2 (15.4%) cases and penicilliosis in 1 (7.7%) case. Because of 2 acute crypto-

Table 1

Age distribution in 22 patients with AIDS excreting *Cryptosporidium* and prevalence rate of cryptosporidiosis among adults and children.

Age groups in year	No. positive	Prevalence rate (%)
Children (21 cases)		
0-2	3	:
2-10	1	children 4/21 (19%)
10-15	-	:
Adults (229 cases)		
15-20	-	:
20-30	8	:
30-40	8	Adults 18/229 (7.9%)
40-50	2	:
50+	-	:

Table 2

Clinical features in 13 AIDS patients with cryptosporidiosis seen at Bamrasnaradura Hospital, Thailand.

Clinical features	No. of patients (%)
Diarrhea	
- Acute diarrhea	2 (15.4)
- Chronic diarrhea	11 (84.6)
Appearance of stools	
- watery stool	12 (92.3)
- mucous stool	1 (7.7)
Weight loss/Malnutrition	13 (100)
Dehydration	
- no	2 (15.4)
- some	11 (84.6)
Fever	6 (46.2)
Vomiting	3 (23.1)
Abdominal pain	1 (7.7)

sporidial diarrhea cases infected with other opportunistic infections (cryptococcal meningitis, penicilliosis), all 13 cases with cryptosporidial diarrhea in this study met the clinical definition of AIDS.

Treatment

Of the 13 patients one (7.7%) case was treated with metronidazole, 2 (15.4%) cases with tetracycline and 2 (15.4%) with loperamide. Seven (53.8%) cases received oral rehydration solution and 6 (46.2%) cases received intravenous fluids. The treatment decreased the duration or severity of diarrhea but cryptosporidia were still observed in stools. However, all patients had been treated with other antimicrobial agents for the other opportunistic infections.

DISCUSSION

Enteropathy occurs frequently in persons infected with human immunodeficiency virus (HIV) (La Brooy, 1993). Many agents, including bacteria, fungi, parasites and viruses have been implicated as causative organisms of diarrhea with malabsorption and contribute to malnutrition (Kotler and Orenstein, 1993;

Cotte *et al*, 1993).

In this study, the overall prevalence rate of cryptosporidiosis in HIV infected patients was 8.8% by detection of stool specimens while it was found in 37.3% of French HIV infected patients by detection of stool samples, duodenojejunal biopsies, and/or colorectal biopsies (Kotler and Orenstein, 1993). The prevalence rate of cryptosporidiosis among children (19%) was higher than among adults (7.9%) in our study and the results differ from the previous study that only 5% of United States children with AIDS reported to the Centers for Disease Control through 1985 had cryptosporidiosis, suggested of less common cause of diarrhea among children than among adults with AIDS (Rogers *et al*, 1987). The prevalence rate of cryptosporidiosis among children in our study was about over 4.75 to 5 times more frequently detected from the stool specimens of immuno-competent children with diarrhea in India (3.8%) (Nath *et al*, 1993) and in Jordan (4%) (Nimri and Batchoun, 1994). However, the prevalence of cryptosporidiosis in HIV infected patients in this study was underestimated because not all these patients, only symptomatic diarrheal patients were examined for cryptosporidium, our results might be different from other studies.

Cryptosporidium species are associated with severe, persistent or recurrent enteritis in patients with AIDS whereas they cause self limited diarrhea in immunologically normal persons (Current and Garcia, 1991). Chronic diarrhea and weight loss were the prominent features of the patients with cryptosporidiosis in this study. *Cryptosporidium* caused mostly some dehydration with average frequency of 7.3 motions/day with watery stools. No dysenteric features were observed in this study which is well supported by the absence of red blood cells in stools. Few fecal leukocytes were detected in 15.4% of all 13 cases. It was similar to the previous findings that leukocytes were rarely found in cryptosporidium cases (Huicho *et al*, 1993).

The other clinical features were vomiting, fever, abdominal pain. These clinical features were similar to the previous studies (Nimri and Batchoun, 1994; Current and Garcia, 1991; Navin and Hardy, 1987; Thea *et al*, 1993). Although the fever rate in this study was very high (46%), it is not clear whether the high fever was associated with the diarrheal illness or with HIV infection or other opportunistic infections. Respiratory symptoms, reported in other study (Egger *et al*, 1990) were not found in this study.

This preliminary study had many limitations, such as incomplete recorded data and only patients with diarrhea were examined. However, *Cryptosporidium* should be carefully distinguished from cyclospora organisms that are remarkably similar in morphology and clinical features (Laughon *et al.*, 1988).

The results of this study and other previous reports suggest that *Cryptosporidium* is a frequent cause of chronic diarrhea in AIDS patients; laboratories should include *Cryptosporidium* diagnostic techniques with the routine diagnosis of diarrheic stool specimens. Information is needed on the effectiveness of prevention and control strategies.

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