

Correspondence

***Isospora belli*, *Strongyloides stercoralis* & hookworm multiple-infection in a person with HIV infection & normal CD4+ T-lymphocyte count**

Sir,

As a consequence of abrogated immune system, HIV infected patients are vulnerable to a spectrum of infectious and non-infectious opportunistic manifestations during the disease course and/or with improper antiretroviral therapy (ART) drug adherence. Of these, diarrhoea accounts for significant morbidity and mortality rates and is the second leading cause of hospital visits in third-world nations. We report the occurrence of three parasites in the stool specimen of a HIV infected patient presenting with severe diarrhoea and weight loss in spite of normal CD4+ T-lymphocyte count (normal values 448 - 1593 cells/ μ l)¹.

In January 2007, a 35 yr old female with HIV infection was admitted to the inpatient department of the YRG Centre for AIDS Research and Education (YRG CARE), Chennai, Tamil Nadu with a chief complaint of profuse, watery diarrhoea, three to four times a day, for two weeks. The patient was afebrile with intermittent history of vomiting for the past one month, loss of appetite and marked weight loss. The patient was diagnosed with HIV infection in April 2005 and presumed to have acquired HIV infection through heterosexual route from her HIV positive spouse. She had been on ART since May 2006 and reported poor adherence. On examination, the patient had a temperature of 98^o F, a pulse of 78 beats/minute, and a blood pressure of 90/70 mmHg. The patient was oriented, thin and dehydrated. Abdominal examination did not reveal any tenderness or organomegaly. Cardiovascular (CVS) examination revealed S1S2 (+) with no murmur and respiratory examination, (RS) revealed normal vesicular breath sounds. The patient also presented oral candidiasis and perioral pigmentation.

Laboratory examination of haematological, immunological and biochemical parameters revealed that the patient had a haemoglobin (Hb) of 11.8 g/dl (normal values 10-15 g/dl), erythrocyte sedimentation rate (ESR) of 57 mm (normal value 0-20 mm), total thrombocyte count of 243 x 10⁹/l (normal values 137-367 x 10⁹/l), total leucocyte count of 8.0 x 10⁹/l (normal values 3.9-9.4 x 10⁹/l), and a high total lymphocyte count (TLC) of 4.1 x 10⁹/l (normal values 1.2-3.4 x 10⁹/l). Her absolute CD4+ T-lymphocyte count (Beckman Coulter Inc, CA, USA) was 517 cells/ μ l (normal values 448-1593 cells/ μ l). Liver function test (LFT) revealed high level of alanine aminotransferase (ALT) viz., 86 IU/l (normal value 0-29 IU/l), total bilirubin of 0.4 mg/dl (normal value 0.3-2.0 mg/dl), direct bilirubin of 0.1 mg/dl (normal value 0.1-0.3 mg/dl), and a conjugate bilirubin of 0.3 mg/dl (normal value 0-1.1 mg/dl). Her renal function test were not normal viz., urine creatinine was 0.5 mg/dl (normal value 0.7-1.0 mg/dl) and blood urea 29 mg/dl (normal value 9-27 mg/dl).

Gross examination of stool specimen showed watery consistency with no mucus and guaiac-based method revealed presence of occult blood in stool. Stool specimen was concentrated using formalin-ether concentration technique³. Microscopic observation of wet mount preparation of stool concentrate with saline revealed numerous live of *Strongyloides stercoralis* that were identified by the characteristic morphology, (~400 μ m length by 15 μ m breadth), with notched tail tip and genital primordium. *Isospora belli* oocysts and hookworm ova were identified by their characteristic microscopic morphology following standard methods². Stool culture was negative for pathogenic bacteria and fungi. Special staining for detection of microsporidiosis was not performed. After

administration of Ciplin DS (trimethoprim IP 160 mg and Sulphamethoxazole IP 800 mg), Nipcon 150 mg (fluconazole) and Zentel® 400 mg (albendazole) the clinical symptoms resolved successfully and the patient was discharged. The patient is under follow up for primary care.

Results of a recent study from our centre corroborated with other Indian studies in reporting *I. belli* as the most common copro-parasite in HIV infected individuals with diarrhoea and revealed an increasing trend in the proportion of isosporiasis³⁻⁶. *S. stercoralis* is reported to be an important parasite owing to its potential role in serious disease in immune abrogated subjects⁷. The incidence of *S. stercoralis* in HIV infected patients is estimated to be about 5-6 per cent^{8,9}. Hookworm infection often caused by *Necator americanus* and *Ancylostoma duodenale* is believed to be an important cause of chronic intestinal blood loss and anaemia in the tropics¹⁰. Hence, conceptually *I. belli* and *S. stercoralis*, being opportunistic parasites often associated with diarrhoea in HIV positive subjects may be held as the prime suspects of severe diarrhoea and weight loss as compared with hookworm in the present case¹¹⁻¹⁴.

The differential diagnosis of chronic diarrhoea is extensive and includes the investigation of several diseases, such as celiac disease, inflammatory bowel disease and irritable bowel syndrome. Because chronic diarrhoea in patients infected with HIV accounts for significant morbidity and mortality, early detection and prompt treatment of patients with HIV/AIDS is crucial in controlling complications. Further, consideration of multiple parasitic infections in the differential diagnosis of chronic diarrhoea may have both important clinical and epidemiological implications. It is intriguing how the parasites caused overt clinical infection in spite of normal CD4+ T-lymphocyte count seen in the HIV positive subject. More interestingly, the subject's haemoglobin level (11.8 g/dl) was within the normal range despite hookworm infection. In addition, as a part of good clinical laboratory practice, diagnostic laboratories should perform a thorough investigation of the clinical specimen under investigation (wet mount or stained preparations) even after detecting the first aetiological agent. The present report therefore, underscores the importance of virtually reporting multiple aetiological causes in HIV/

AIDS and strongly emphasizes the need for extensive investigation of specimens with parasitic suspicion, in addition to looking for other microbial agents.

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References

1. Murugavel KG, Balakrishnan P, Mohankrishnan J, Piwowar-Manning E, Livant E, Mayer KH, *et al.* Establishment of reference values of CD4 and CD8 lymphocyte subsets in healthy adults in southern India. 14th Conference on Retroviruses and Opportunistic Infections; 2007 February 25-28; Los Angeles, US. Abs no. 402; p. 211.
2. Forbes BA, Sahm DF, Weissfeld AS. *Bailey & Scott's diagnostic microbiology*. 11th ed. St.Louis: Mosby; 2002.
3. Vignesh R, Balakrishnan P, Shankar EM, Murugavel KG, Hanas S, Cecelia AJ, *et al.* High proportion of isosporiasis among HIV infected patients with diarrhoea in southern India. *Am J Trop Med Hyg* 2007; 77 : 823-4.
4. Banerjee I, Primrose B, Roy S, Kang G. Enteric parasites in patients with diarrhoea presenting to a tertiary care hospital: comparison of human immunodeficiency virus infected and uninfected individuals. *J Assoc Physicians India* 2005; 53 : 492.
5. Kumar SS, Ananthan S, Saravanan P. Role of coccidian parasites in causation of diarrhoea in HIV infected patients in Chennai. *Indian J Med Res* 2002; 116 : 85-9.
6. Mohandas K, Sehgal R, Sud A, Malla N. Prevalence of intestinal parasitic pathogens in HIV seropositive individuals in Northern India. *Jpn J Infect Dis* 2002; 55 : 83-4.
7. Shah UV, Purohit BC, Chandralekha D, Mapara MH. Coinfection with *Cryptosporidium*, *Isospora* and *S. stercoralis* in a patient with AIDS- a case report. *Indian J Med Microbiol* 2003; 21 : 137-8.
8. Feitosa G, Bandeira AC, Samaio, DP, Badaro R, Brites C. High prevalence of giardiasis and strongyloidiasis among HIV-infected patients in Bahia, Brazil. *Braz J Infect Dis* 2001; 5 : 339-44.
9. Silva TD, Raychaudhuri M, Poulton M. HIV infection associated with *Strongyloides stercoralis* colitis resulting in *Streptococcus bovis* bacteraemia and meningitis. *Sex Transm Infect* 2005; 81 : 276-7.
10. Hotez PJ, Brooker S, Bethony JM, Bottazzi ME, Loukas A, Xiao S. Hookworm infection. *N Engl J Med* 2004; 351 : 799-807.

11. Mukhopadya A, Ramakrishna BS, Kang G, Pulimood AB, Mathan MM, Zakaraia A, *et al*. Enteric pathogens in Southern Indian HIV infected patients with and without diarrhoea. *Indian J Med Res* 1999; 109 : 85-9.
12. Ballal M, Prabhu T, Chandran A, Shivananda PG. *Cryptosporidium* and *Isospora belli* diarrhoea in immunocompromised hosts. *Indian J Cancer* 1999; 36 : 38-42.
13. Joshi M, Chowdhary AS, Dalal PJ, Maniar JK. Parasitic diarrhoea in patients with AIDS. *Natl Med J India* 2002; 15 : 72-4.
14. Certad G, Arenas-Pinto A, Pocaterra L, Ferrara G, Castro J, Bello A, *et al*. Isosporiasis in venezuelan adults infected with human immunodeficiency virus: clinical characterization. *Am J Trop Med Hyg* 2003; 69 : 217-22.