

Cryptosporidiosis with and without HIV infection in India

This issue of Tropical Parasitology includes two reports of a pathogen that is increasingly in the news since the recent publication of the Global Enterics Multi-Center Study (GEMS) last year.^[1] The GEMS study showed that in developing countries in Asia and Africa, cryptosporidiosis was casually implicated in a large proportion of moderate to severe gastroenteritis in children <5 years of age, second only to rotavirus.

Data that have accumulated in the last nearly three decades indicates that there are several settings in which cryptosporidial infections in humans are important.^[2] The first, and most consequential for the individual patient, is the severe, life-threatening acute gastroenteritis produced in immunocompromised patients, particularly those with HIV not on antiretroviral therapy. The second category is gastroenteritis in children, which tends to be largely self-limited, but can occasionally manifest as persistent diarrhea. This form of cryptosporidial infection in early childhood has been reported to be associated with subsequent impairment in growth, physical fitness and cognitive function. Possibly because of compromised immune function, malnourished children tend to have a higher prevalence of this parasitic infection, and have more severe consequences of disease, including increased risk of subsequent recurrence of diarrhea or persistent diarrhea. The final major category is of outbreaks, where disease is acquired mainly from water contaminated by oocysts derived from human or animal sources.^[2] Of these three important clinical situations, outbreaks are rarely seen in developing countries, which could be either because of continuous exposure resulting in some level of protection from disease in most age groups, or because of inadequate testing and documentation.

In the publications on cryptosporidiosis in this journal, a study from Mumbai evaluated 93 HIV seropositive and 93 seronegative patients with diarrhea, but including all ages and both in-patients and outpatients, by microscopic examination using acid-fast staining and by ELISA.^[3] The investigators found that 17.2% of HIV seropositive and 5.4% of HIV seronegative patients were positive for cryptosporidiosis. As might be expected for a parasite where morphological identification is dependent on the staining of the oocyst wall, known to be variable in older oocysts, the antigen detection ELISA identified nearly 1½ times as many positive as seen by microscopy. In seropositive children ($n = 13$), four had cryptosporidiosis, but no further clinical details are provided. Interestingly, cryptosporidiosis was not identified in any HIV seronegative children or in HIV positive persons with a CD4 count >200 cells/mm³. These data are a valuable addition to the literature on cryptosporidiosis in the context of HIV in India.^[4] The first reports began with studies on the symptomatic cryptosporidiosis in HIV infected adults, and over several years studies indicated a prevalence of <1% to >80% in different parts of India. As in the study reported here, others from India have also shown that symptomatic cases had CD4 counts <200 cell/mm³.^[5] The Mumbai study was conducted in 2009-2010, and it will be of interest to measure the decrease in the prevalence of diarrhea or cryptosporidiosis after the most widespread use of antiretroviral therapy.

The study also evaluated different methods of acid-fast staining and very unusually it appears that while use of 3% acid-alcohol resulted in the detection of cryptosporidial oocysts, it required 10% sulphuric acid to detect oocysts of *Cystispora belli*. Evaluation of a larger number of samples and using methods of concentration other than Sheather's sugar flotation may be required to define the most appropriate acid-fast stain.

A study on gastroenteritis in West Godavari district in Andhra Pradesh, conducted in 2006-2007 reports on 306 patients with gastroenteritis, with 54% adults.^[6] The overall prevalence in children (14%) was lower than in adults (35%), but among the 78 *Cryptosporidium*

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