THE RELEVANCE OF LABORATORY DIAGNOSIS OF HUMAN CRYPTOSPORIDIOSIS AND OTHER COCCIDIA

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SUMMARY
Human infection by Cryptosporidium spp and other coccidia are due to opportunistic non-host specific microorganisms. In HIV seropositive patients, the gastrointestinal symptoms accompanying such infections may be serious and prolonged and may include nausea, low-grade fever, abdominal cramps, anorexia and watery diarrhea. We studied 188 stool samples from 111 patients (84 men and 27 women) with diarrhea. A modified Ziehl-Nielsen technique for the detection of Cryptosporidium spp and Isospora belli was employed. The mean age of the patients was 31 years. Cryptosporidium spp was seen in 18% (n=20) of the patients, 90% (n=18) of whom were HIV seropositive. Isospora belli was recorded only from HIV seropositive patients (5.4% of all the patients studied and 6.5% of those who were HIV seropositive). These data confirm the good results obtained with this technique for the identification of Cryptosporidium spp and other coccidia and also reaffirm the clinical importance of correctly diagnosing the cause of diarrhea, particularly in HIV seropositive patients.

KEYWORDS: Cryptosporidium spp; Isospora belli; Diarrhoea; AIDS; Staining.

INTRODUCTION
Cryptosporidium spp and Isospora belli have recently been recognized as enteric pathogens. In the last 10 years, Cryptosporidium spp has been recognized as one of the most common causes of acute and self-limited gastroenteritis induced by a protozoan parasite in immunocompetent people. In the immunocompromised, cryptosporidiosis is a common and life-threatening condition causing profuse diarrhea accompanied by severe dehydration, malabsorption and wasting. Isospora belli is an opportunistic protozoan pathogen in patients with AIDS. The resulting infection is characterized by chronic watery diarrhea and weight loss and is indistinguishable from that caused by related coccidia genus Cryptosporidium.

The purpose of this investigation was to establish the frequency of cryptosporidiosis and isosporidiosis in patients with chronic diarrhea. The clinical relevance of this diagnosis is discussed.

MATERIAL AND METHODS
From July 1991 to May 1993, we examined 188 stool samples from 111 patients with diarrhea (84 males and 27 females, with a mean age of 31 years (range: 2 months to 76 years)) treated at the University Hospital of the State University of Campinas (UNICAMP). Ninety-two of the 111 patients (83%) were HIV seropositive.

All fecal samples were studied using a modified Ziehl-Nielsen procedure for the detection of Cryptosporidium spp and Isospora belli. The diagnosis of enteric cryptosporidiosis and isosporidiosis was based on the identification of the acid-fast oocyst form of these protozoa which differs from morphologically similar but
non-acid fast yeasts Cryptosporidium spp and Isospora belli both stain bright red against a green background. Isospora belli oocysts are distinguished from other coccidian oocysts by the size, shape and numbers of sporocysts. Thus, this method can identify both coccidia at the same time.

RESULTS

Cryptosporidium spp was identified in 20 patients (18% of the total) and in 29 stool samples (15.4% of the total). Eighteen of these 20 patients (90%) were HIV seropositive. The frequency of cryptosporidiosis among all the HIV seropositive patients (n=92), was 19.6%.

Isospora belli was observed only in HIV seropositive patients and occurred in 5.4% of all the patients and in 5.8% of the samples. Among HIV seropositive patients, the frequency of I. belli was 6.5%. None of these patients was positive for Cryptosporidium spp.

DISCUSSION

Diarrhoea is a prominent feature of AIDS and is present in 50-60% of the patients in the United States and in more than 95% of patients from Haiti and Africa.

Isospora belli and Cryptosporidium spp are known causes of enteric disease in man and both are capable of causing chronic disease and malabsorption in individuals with defective immunity. Furthermore, these microorganisms are the most commonly identified causes of chronic diarrhoea in AIDS patients.

In the present study, Isospora belli occurred in six out of 92 patients (6.5%) with AIDS. This frequency exceeds that observed in AIDS patients studied by the Centers for Disease Control in the USA (<0.2%) (SELJR, R.: personal communication) and, in Brazil, by WUHIB et al. (1.3%) and by SAUDA et al. (3%), but is lower than that observed in Haiti (15%) over a one year period.

Cryptosporidial infection of the immunocompetent host has been described in over 40 countries. However, the true prevalence of such infections is not known. Prevalence rates obtained from large scale surveys of selected populations range from 0.6 to 20% for developed countries and from 4 to 20% for developing countries. In the USA, 3-4% of AIDS patients have cryptosporidiosis while in Haiti and Africa, 50% of such individuals suffer from this disease. In recent studies, the parasite in question was detected in 16% of patients with AIDS and diarrhoea. In Brazil, some studies have been carried out and cryptosporidial infection have been detected in 21.4%, 19.1%, 14.3% and 12.1% of HIV-infected patients with diarrhoea or gastrointestinal manifestations. Our work shows that the frequency of Cryptosporidium spp in Campinas, Southeast of Brazil, is around 20% which is three times higher than for isosporidiosis.

Cryptosporidiosis is a cosmopolitan disease widespread in animals and only since the early 1980’s has it been recognized as a significant pathogen for humans. The detection of Cryptosporidium spp in AIDS patients heightened physicians’ awareness of its pathogenic potential in both immunocompromised and immunocompetent individuals. Cryptosporidiosis is the only opportunistic infection of persons with AIDS for which there is no known therapy and most attempts at treating it have failed. Thus, in the absence of effective anticytosporidial therapy, the prevention of infection is of great importance.

Isospora belli is most commonly found in tropical and subtropical regions, but its prevalence is unknown even though it has been recognized as a human pathogen since 1915. Unlike cryptosporidiosis, treatment with oral trimethoprim-sulfamethoxazole for one week is effective, despite the high frequency of recurrence.

Our data confirm the good results obtained with the acid-fast staining method for the recovery and identification of Cryptosporidium spp and Isospora belli. They also reaffirm the clinical importance of a correct diagnosis for chronic diarrhoea, particularly in HIV seropositive patients.

RESUMO

Importância do diagnóstico laboratorial da criptosporidose humana e outras coccídias.

Infecção humana por Cryptosporidium spp e outros coccídeos deve-se a microorganismos oportunistas hospedeiros não-específicos e, em pacientes HIV positivos, os sintomas gastro-intestinais podem ser sérios e prolongados incluindo náuseas, fétide baixa, dores abdominais, amônia e diarreia aquosa. Estudamos 188 amostras de fezes provenientes de 111 pacientes (84 homens e 27 mulheres, com idade média de 31 anos) com diarreia, atendidos no Hospital das Clínicas da Universidade Estadual de Campinas. Para detecção de Cryptosporidium spp e Isospora belli empregamos a técnica de Ziehl-Nelson modificada. Oitenta e três por cento dos pacientes (n=92) eram HIV positivos. Cryptosporidium spp foi observado em 18% de todos os pacientes, sendo que destes, noventa por cento eram HIV positivos. Isospora belli foi evidenciada somente em pacientes HIV positivos, com uma fre-
quência de 5,4% de todos os pacientes e de 6,5% considerando-se apenas os pacientes HIV positivos. Este estudo confirma os bons resultados obtidos com a técnica empregada para identificação de Cryptosporidium spp e outros coccídios, além de ressaltar a importância da investigação etiológica apropriada em casos de diarreia prolongada, especialmente em pacientes imunossuprimidos.

REFERENCES


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