Co-infection with *Cyclospora cayetanensis* and *Salmonella typhi* in a patient with HIV infection and chronic diarrhoea

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A 45-year-old-Haitian male patient with fever, abdominal cramping, chronic diarrhoea and weight loss of about 3 kg was investigated. Stool examination revealed *Salmonella typhi* and *Cyclospora cayetanensis*. The HIV test was positive with a CD4 count of 130 cells/mm³. We provided the first report of co-infection *Cyclospora cayetanensis* and *Salmonella typhi* in a HIV patient with chronic diarrhoea. The patient was treated with oral ciprofloxacin, 500 mg, twice daily for two weeks, with a good clinical outcome.

Keywords: *Cyclospora*, *Salmonella typhi*, HIV infection

Introduction

Cyclospora infection is prevalent in human immunodeficiency virus (HIV) patients.¹ With 2.2% of adults estimated to be HIV-positive, Haiti has the largest epidemic in the Caribbean.² Furthermore, typhoid fever is endemic in such an island.³ We report the case of a patient with chronic diarrhoea and HIV infection, and co-infected with *Cyclospora cayetanensis* and *Salmonella typhi*.

Case Report

A 45-year-old married male, resident of a slum area in Port au Prince, Haiti, was admitted to La Renaissance hospital with complaints of fever, abdominal cramping, liquid diarrhoea of more than 4 weeks duration, and weight loss of about 3 kg. Physical examinations revealed few positive signs: fever of 38.5°C and heart rate of 100. His blood pressure was normal, with no lymphadenopathy. His weight and height were 64 kg and 167 cm, respectively.

The following complementary tests were indicated: stool analysis for bacteriological culture and parasitological examination by standard methods and modified Ziehl–Neelsen stain, hemogram, HIV test, malaria microscopy, and thorax radiography. A modified Ziehl–Neelsen stain of the stool sample revealed spherical pink organisms 10 µm in diameter, suggestive of *C. cayetanensis*.⁴

For bacteriological examination, the stool sample was inoculated to plates of Mac Conkey agar, *Salmonella*-*Shigella* agar and Thiosulfate-citrate-bile

salts-sucrose agar. *S. typhi* was isolated from stool specimen and confirmed by biochemical and serological methods.⁵ Hematologic examination revealed anemia (haemoglobin level of 7.8 g/dl), and normal white blood cell count of $9 \times 10^9/l$ and platelet count of $250 \times 10^9/l$.

HIV test was performed by a rapid test (SD Bio Standard, India), and resulted positive. The patient was not aware about his HIV-positive status. He was advised to visit the Health Department for laboratory confirmation of the HIV infection and for clinical–immunological evaluation. A CD4 count was determined 5 months after medical admission to the hospital revealing a value of 130 cells/mm³. The results of malaria microscopy and thorax radiography were negative.

As therapy for both gastrointestinal infections, oral ciprofloxacin (500 mg), twice daily for 2 weeks was used.³ Patient responded clinically to such therapy.

Discussion

In Haiti, 34% of patients seeking attention for chronic diarrhoea at the Gheskio AIDS Clinic in Port-au-Prince had *Cyclospora* infection,¹ but the prevalence of such infection is of 15–20% in the general population.⁴

Unlike complications by non-typhi *Salmonellae*, *S. typhi* infection has been infrequently reported in the context of HIV-AIDS.⁶

Both *C. cayetanensis* and *S. typhi* are food-borne and waterborne intestinal infections prevalent in developing countries such as Haiti, in which sanitary conditions are very poor.^{6,7} Co-infection with *Cyclospora*, *Cryptosporidium*, and other parasites has been described for immunocompetent and immunocompromised individuals.⁷

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Patients infected with *Cyclospora* have non-specific symptoms, such as watery diarrhoea, abdominal distention, abdominal pain, and anorexia.⁷ Watery diarrhoea in HIV-infected individuals can be produced by a broad group of intestinal organisms, such as bacteria, virus, intestinal protozoa, and fungi.⁸ Therefore, definitive diagnosis requires microbiological, parasitological, and virological laboratory techniques.

Differential diagnosis of fever in HIV individuals from the tropics is difficult to ascertain. In this case, we might discard other infectious aetiologies, as tuberculosis (TB), dengue, malaria, shigellosis and amoebiasis by the clinical symptoms and by complementary tests.⁹ We can suppose that *S. typhi* is the leading cause of fever in our patient.

To our knowledge, this represents the first report of co-infection *C. cayetanensis* and *S. typhi* in a HIV patient with diarrhoea. Although never explicitly described, this situation could be considered usual in a setting with a higher incidence of both organisms.

Trimethoprim-sulfamethoxazole (TMP-SMX) is the drug of choice for the treatment of *Cyclospora* infections, however, ciprofloxacin is an alternative therapy, especially in patients allergic or who cannot tolerate sulfas.^{10,11} In our case, we decided to use ciprofloxacin as therapy of both infections, because it is widely reported the high percentage of resistance to TMP-SMX in *S. typhi* strains.³

In the present case, diarrhoea ceased after the first week of therapy, but the patient did not provide a further fecal sample to evaluate the success of the treatment. There was no information about the use of Highly Active Antiretroviral Therapy (HAART) for AIDS.

The current report highlights the importance of HIV screening in sexually active population and stool parasite examination particularly the acid fast staining protozoa in cases with chronic diarrhoea. These may be useful in early diagnosis and treatment, which

could avoid life threatening complications. Public health measures of control and prevention of these enteropathogens, as the provision of better access to treated drinking water and providing education on improvement of sanitation, hygiene, and food preparation practices must take into consideration, especially in areas where HIV prevalence is high.

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