Case Report

A case of cyclosporiasis in a post-renal transplant recipient

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ABSTRACT

The coccidian parasite Cyclospora cayetanensis is a significant aetiology of diarrhoea in both immunocompetent and immunocompromised individuals and is an important cause of traveller's diarrhoea. It is also associated with food- and waterborne outbreaks worldwide. Here, we report a case of cyclosporiasis in a 40-year-old male who underwent a renal transplant three years ago. Currently, the patient had been suffering from watery diarrhoea and nausea for 10 days, and his copro-parasitological examination revealed the presence of C. cayetanensis oocysts. He was successfully treated with cotrimoxazole. Opportunistic parasites should be routinely screened in cases of diarrhoea among immunocompromised individuals to enable timely management.

Key words: Cyclospora, cyclosporiasis, Renal transplant, Diarrhoeal disease.

Diarrhoea in post-renal transplant patients may be caused by a variety of bacteria, parasites and viruses, including *Clostridium difficile*, norovirus, cytomegalovirus (CMV), *Giardia* spp., *Cryptosporidium* spp., *Cystoisospora belli*, *Cyclospora cayetanensis*, *Entamoeba* spp. and microsporidia [1]. Among the parasitic causes, the coccidian parasite *C. cayetanensis* is an important human pathogen that infects both immunocompetent and immunocompromised hosts, including transplant recipients [2]. It is also widely distributed, implicated in many food- and waterborne outbreaks in developed nations, and is often associated with food exported from developing nations [3]. An ongoing *C. cayetanensis* outbreak in the United States (US) resulting in infection of over 6350 people across 15 states, 278 hospitalisations, and two deaths has brought into focus the public health importance of this protozoan [4]. A recent case series from a tertiary care hospital in India identified 16 cases of cyclosporiasis among 162 stool samples collected from immunosuppressed patients, including transplant recipients (liver/renal/bone-marrow), malignancies, and human immunodeficiency virus (HIV) positive patients presenting with diarrhoea, highlighting its importance in the immunosuppressed population [5]. Here, we present a case of cyclosporiasis in a renal transplant recipient who presented with watery diarrhoea for 10 days.

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CASE REPORT

A 40-year-old male presented to the medical outpatient department with diarrhoea for the last ten days. The diarrhoea was associated with an inability to take solid oral feeds, nausea, and vomiting over the last four days. He had undergone a liver-related renal transplant three years ago because of advanced-stage chronic kidney disease. After transplant, he was on triple immunosuppression therapy comprising tacrolimus, mycophenolate mofetil, and prednisolone. The frequency of the diarrhoeal episodes was 6–7 per day; the stools were loose and watery in consistency and associated with 2–3 episodes of vomiting with raised body temperature. The patient's stool sample was sent for bacterial and parasitic examination. Modified Ziehl-Neelsen staining of the stool showed the presence of *C. cayetanensis* oocysts, identified by morphological features (8–10 µm, variably acid-fast and spheroidal) (Figure 1) [3]. However, stool culture did not show growth of any enteropathogenic bacteria. He was started on trimethoprim-sulfamethoxazole 160/800 mg (TMP-SMX; cotrimoxazole) twice a day for two weeks.

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The symptoms gradually decreased after the initiation of therapy, and diarrhoea resolved completely within 10 days, after which stool sampling done on three consecutive days was negative for parasites, indicating resolution of the infection.

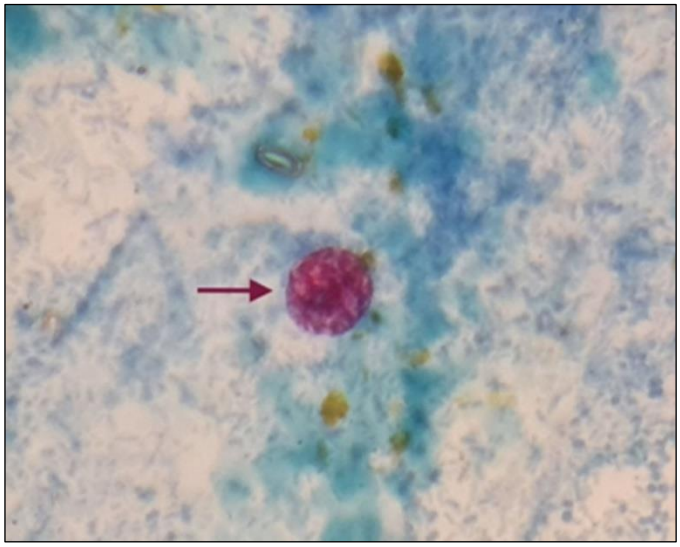

Figure 1. Modified Ziehl-Neelsen staining of stool sample showing *Cyclospora cayetanensis* oocysts (arrow) (magnification ×1000)

DISCUSSION

Currently, nineteen *Cyclospora* species have been identified as disease-causing agents in various animal species. Out of these nineteen, only *C. cayetanensis* has been reported to be associated with acute and chronic diarrhoea syndromes in humans [6]. Although endemic in tropical and subtropical regions, it has been widely identified as the causative agent of various gastroenteritis outbreaks worldwide. Cyclosporiasis is endemic in Latin America, the Middle East, and Southeast Asia, including the Indian subcontinent [7].

The parasite is highly resistant to food-industry disinfectants and increased global trade facilitates its transport across wide geographical areas, posing significant risks. Foodborne and waterborne outbreaks are mainly associated with the consumption of fresh fruits and vegetables, including blueberries, raspberries, lettuce, and parsley. The parasite has been implicated in seasonal outbreaks of diarrhoea in the US, with cases peaking from May to August, as also noted from the one ongoing since June 2026 [4,7]. However, in our patient, there was no history of consumption of such foods, which would rule out any food product or water as a possible source of infection. It can cause infection in all age groups and in both immunocompromised and immunocompetent individuals. In people with a preserved immune system, the disease is usually self-limiting but has a more severe course in immunocompromised patients. There are reports of cyclosporiasis from around the world in patients living with HIV infection, and in those with malignancies. Cyclosporiasis has also been described in solid organ transplant recipients, mainly renal [8].

The prevalence of *C. cayetanensis* infection in post-renal transplant recipients is variable depending on the region. In India, while Ghosal et al. described a high prevalence (50%) of infection in post-renal transplant recipients, Yadav *et al*. reported an incidence of 5% [2,9]. Previous cases of cyclosporiasis in renal transplant recipients have been reported from the US, Mexico and Poland. These patients had chronic watery diarrhoea with symptoms lasting over 2 to 3 months, associated with loss of weight and a history of travel to another country with consumption of fresh vegetables [10–12]. The presentation in our patient was more acute, lasting over 10 days, with no similar associated complaints, emphasizing the importance of keeping a high index of clinical suspicion.

The diagnosis is mainly made by conventional methods, i.e., modified acid-fast staining and detection of autofluorescence exhibited by the parasite. Detection can often be challenging, as the parasite may shed intermittently. It is recommended to examine three stool samples on alternate days for more than one week to achieve a >95% detection rate [13]. Due to their similar size, micrometry is crucial for differentiating *C. cayetanensis* oocysts (8–10 μm, light, clear pink to deep red with granules or a bubbly appearance) from *Cryptosporidium* oocysts (4–6 μm, pinkish red and almost spherical) [3,14]. Nucleic acid amplification tests (NAATs) are more sensitive and may play an important role in screening for food quality assessment and water testing, as well as for diagnosing individual cases and outbreaks. Diagnostic challenges have been reported previously. Visvesvara et al. described a 55-year-old renal transplant recipient with a history of travel to the Dominican Republic, presenting with a 2-month history of watery diarrhoea and 9 kg weight loss, in whom four stool examinations were negative before *C. cayetanensis* was confirmed by duodenal biopsy and polymerase chain reaction (PCR), highlighting that conventional stool microscopy may fail to detect infection in some cases [10].

However, molecular testing was not required in our patient, as the diagnosis was established by microscopy. During the 2018 outbreak in the US, successful diagnosis was achieved only with NAATs [15]. However, the limitations of NAATs are their high cost and limited availability in most laboratories in developing countries. The BioFire FilmArray gastrointestinal (GI) panel (bioMérieux, France) is the only commercially available molecular platform that detects *C. cayetanensis* [16]. The disease may still be underreported due to a lack of clinical suspicion, the examination of only one stool specimen in most laboratories, and the high cost of molecular diagnosis.

Supportive care is an essential component of treating diarrheal disease. Immunosuppression should be reduced if possible in cases of *C. cayetanensis* infection. The first-line

treatment is TMP-SMX, with the dose adjusted based on the patient's immune status. Our patient was successfully treated with TMP-SMX. For immunocompetent individuals, the usual recommendation is 7 to 10 days. However, in recurrent cyclosporiasis, secondary prophylaxis with TMP-SMX three times a week for an indefinite period may be required. The American Society of Transplantation Infectious Diseases Community of Practice recommends ciprofloxacin (500mg twice daily orally for 7 days, followed by 1 tablet 3 times per week for secondary prophylaxis) for intolerant patients or those with sulpha allergy [17]. Silva et al. recommend pre-transplant screening for gastrointestinal protozoans by microscopic examination of stool specimens in at least three samples in endemic regions. Also, patients who are positive by the screening test should be administered species-specific drugs before transplantation [18]. Controlling contamination sources in the field, packaging units, and farm personnel is critical to prevent *C. cayetanensis* infection in endemic areas. Access to toilets, comprehensive handwashing, and proper treatment and disposal of human faecal matter are other necessary steps [7].

Our report describes a single patient and therefore cannot establish the frequency, risk factors, or clinical outcomes of cyclosporiasis among renal transplant recipients. Nevertheless, it highlights an uncommon but clinically important parasitic infection in this population. In conclusion, *C. cayetanensis* is a neglected yet important coccidian parasite that causes diarrhoea in both immunocompetent and immunocompromised patients. It should be considered in the differential diagnosis of patients with diarrhoea in transplant recipients. A high index of suspicion, prompt diagnosis, and rapid treatment play a crucial role in patient management.

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