Case Report

Cyclosporiasis associated with diarrhoea in an immunocompetent patient in Turkey

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Cyclospora cayetanensis, the parasitic agent responsible for human cyclosporiasis, is an emerging worldwide cause of diarrhoea in immunocompetent people as well as in immunocompromised patients, such as those with AIDS. Reported here is the case of a 30-year-old Turkish woman, a lawyer, who was admitted to hospital in July 2002 with complaints of watery diarrhoea, anorexia, nausea, vomiting, abdominal pain and weight loss over a period of 1 week. Cyclospora sp. oocysts were determined by using modified Kinyoun’s acid-fast stain. The patient was treated with trimethoprim/sulfamethoxazole (160/800 mg) b.i.d. for 7 days. This report is the first example of autochthonous cyclosporiasis in an immunocompetent patient in Turkey.

Introduction

Cyclospora cayetanensis, the parasitic agent responsible for human cyclosporiasis, is an emerging worldwide cause of diarrhoea in immunocompetent people as well as in immunocompromised patients, such as those with AIDS. Cyclospora infects the small intestine and typically causes an illness characterized by watery diarrhoea, with an average of four to eight stools produced per day. The length of time between becoming infected and developing symptoms has not been well established, it probably averages at least several days, but has been reported to be as short as 1 day and as long as 7 days. Mild infections may produce few or no clinical signs; some people infected with Cyclospora do not develop any symptoms. If not treated, the illness may last for a few days to a month or longer. The symptoms associated with infection in the organism have been reported to resemble those of cryptosporidial infection, including watery diarrhoea, nausea, weight loss and abdominal pain (Hart et al., 1990; Pape et al., 1994; Albert et al., 1994; Shields & Olson, 2003). Because Cyclospora resembles the Cryptosporidium oocyst in modified Kinyoun’s acid-fast stain, it is strongly recommended that all laboratories screening for the latter parasite make precise measurements of oocysts. It is quite possible that many cases of diarrhoea reported to be due to Cryptosporidium might actually be due to Cyclospora. Because Cyclospora organisms have now been isolated from patients with AIDS and chronic diarrhoea, this infection should be carefully distinguished from cryptosporidiosis (Long et al., 1990; Ortega et al., 1993; Pape et al., 1994).

AIDS who was admitted to hospital in December 1996 with chronic diarrhoea, vomiting and fever. There was a preceding history of episodic watery diarrhoea, vomiting and weight loss along with intermittent fever over a period of 1 year. Enzyme immunoassays for HIV antibodies were positive and the T4-to-T8 ratio was 0.6 in serum (Koç et al., 1998). The second case, involving a 7-year-old male patient with acute myeloblastic leukaemia, presented as sudden diarrhoea which was due to infection with Cyclospora. The patient was treated with 15 mg trimethoprim/sulfamethoxazole (TMP/SMZ) kg⁻¹ day⁻¹ (Büg et al., 2000). The third case involved a 40-year-old man with AIDS who had diarrhoea that lasted for 2 months (Yazar et al., 2000). The fourth case involved a 52-year-old male patient with idiopathic hepatic cirrhosis who complained of diarrhoea and weakness (Yazar et al., 2002). In this article, we present not only the fifth report of cyclosporiasis in Turkey but also the first report of the infection in an immunocompetent patient.

Patient

A 30-year-old woman, a lawyer, was admitted to hospital in July 2002 with complaints of watery diarrhoea, anorexia, nausea, vomiting, abdominal pain and weight loss over a period of 1 week. The patient had no diet programme, travel history and no such symptoms were reported in the household. She was living in an urban area, where the drinking water was sanitized by the municipality. There was no animal exposure, etc. A stool specimen from the woman was examined microscopically using formol-ethyl acetate sedimentation and saline-lugol techniques. In direct wet mounts, microscopic analysis of the stool sample revealed numerous spherical double-walled micro-organisms, of 8–9 µm in diameter, some with internal granulation (Fig. 1). These round bodies were stained using modified Kinyoun’s acid-fast stain and were 8–9 µm in diameter. The four cases of cyclosporiasis have been reported in Turkey. The first case involved a 50-year-old woman with 10.1099/jmm.0.45531-0

Abbreviations: SMZ, sulfamethoxazole; TMP, trimethoprim.

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fast staining. The modified Kinyoun’s acid-fast stain was performed according to Ash & Orihel (1987) by a slight modification of 2 % sulfuric acid for decolourization. After modified Kinyoun's acid-fast staining of the stool sample, the organisms appeared faint-pink to red in colour, with some cysts not taking up the acid-fast stain and appearing as ‘ghosts’. The oocysts have been described as looking like wrinkled cellophane with no internal structures (not yet mature when passed). Routine bacteriological cultures of the stool sample were negative. The organism present in the stool sample was identified as *Cyclospora* sp. The stool specimen was also examined by fluorescence microscopy at wavelength 365 nm. The walls of the oocysts gave shiny blue autofluorescence (Fig. 2). These results confirmed that the parasite present in the stool sample was *Cyclospora* sp.

**Fig. 1.** Spherical double-walled micro-organism in direct wet mount (8–9 μm in diameter).

**Fig. 2.** The wall of an oocyst exhibiting autofluorescence (fluorescence microscopy, wavelength 365 nm).

Immunodeficiency was not determined in the patient. Enzyme immunoassays for HIV antibodies were negative and the T4-to-T8 ratio was normal. No acid-fast bacilli were detected in sputum specimens or in cultures. The stool specimen was negative for occult blood and contained few leukocytes.

The patient’s family (son, husband, mother and father) was examined for cyclosporiasis three times at intervals of 1 week; the results of these examinations were negative using Kinyoun’s acid-fast staining.

The treatment of choice for *Cyclospora* infections is TMP/SMZ, which is administered for 7–10 days (longer, if symptoms persist) (Madico et al., 1993). The adult dosage is 160 mg TMP plus 800 mg SMZ taken orally twice daily. In this study, the patient was treated with TMP/SMX (160/800 mg) b.i.d. for 7 days. Clinical symptoms of cyclosporiasis were reduced in 2 days and disappeared after 7 days. *Cyclospora* oocysts were not detected in the stool samples examined on days 3, 7 and 14 following treatment. *Cyclospora* oocysts were not detected in monthly examinations over a period of 6 months.

**Conclusion**

Several reports of human cases of *Cyclospora* infection were reported worldwide following the first report in the 1970s. In the early 1980s, *Cyclospora* was recognized as a pathogen in patients with AIDS. It is now known that *Cyclospora* is endemic in many parts of the world, with a higher prevalence in tropical and subtropical countries (Ashford, 1979; Hart et al., 1990; Pape et al., 1994).

The faecal–oral route via water or food is the most common way of spreading the disease. Although a number of reports suggested links to contaminated food such as strawberries, it is not known how common the various modes of spread are or whether infected animals can be sources of infection. *Cyclospora* infections have been identified in travellers to developing countries and in consumers of perishable food products and water. Epidemics in the USA have been associated with faecal–oral transmission through contaminated water and food. Large outbreaks of cyclosporiasis in 1996 and 1997 in the USA and Canada were associated with contaminated raspberries from Guatemala, indicating the importance of contamination of food in widespread epidemics (Herwaldt & Ackers, 1997; Herwaldt & Beach, 1999).

The risk of infection with *Cyclospora* may vary seasonally; some evidence suggests that infection is most common in spring and summer. While the duration and outcome of the disease are highly variable in immunocompromised patients, particularly AIDS patients, ranging from 2 weeks to several months with full recovery, *Cyclospora* diarrhoeal illness in patients with a healthy immune system can be cured with 1 week of therapy (Wurtz, 1994; Soave & Johnson, 1995; Soave et al., 1998).

Despite its worldwide distribution, cyclosporiasis is not well studied in Turkey. The reported cases were in immunocom-
promised hosts and the agent is often neglected in unexplained diarrhoea in immunocompetent patients. This report is the first example of autochthonous cyclosporiasis in an immunocompetent patient in Turkey.

Additional studies are needed to confirm the association of Cyclospora cayetanensis with disease in other populations and to define the incidence and epidemiological features of this organism. Travellers to tropical countries may be at increased risk for infection.

References