A Rare Cause of Diarrhea in a Kidney Transplant Recipient: *Dipylidium caninum*

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ABSTRACT

We report the first case of dipylidiasis in a kidney transplant recipient. Watery diarrhea due to *Dipylidium caninum* was observed in a male patient who had been undergone kidney transplantation 2 years before. The patient was successfully treated with niclosamide. *D caninum* should be considered as an agent of diarrhea in transplant patients.

DIPYLIDIASIS is a zoonotic disease caused by the cestode *Dipylidium caninum*, which is also called the cucumber or double-pored tapeworm [1]. This parasitosis occurs in dogs and cats, and occasionally in humans. Human infection by *D caninum* is rarely reported in Europe, Philippines, China, Japan, Latin America, and the United States. *D caninum* effects mostly children, one-third of them being infants <6 months old [2,3]. The infection is commonly asymptomatic. But abdominal pain, diarrhea, pruritus ani, and urticaria can be seen. Body segments of the adult tapeworm that resemble cucumber seeds can also be seen in the stool [4].

Incidence of parasitic infections is relatively high in kidney transplant recipients [5], but there is no report in the medical literature that *D caninum* causes infection in adult kidney transplant recipients. The present case is the 1st to report such an infection.

Fig 1. *Dipylidium caninum* egg (Olympus DP21, ×400).

CASE REPORT

A 26-year-old male patient was diagnosed with glomerulonephritis since 2005. He had been dependent on hemodialysis from July 2010 to March 2012. Then he received a kidney transplant from a live donor. He was a cook and was working part time. Diarrhea was 2–3 times per day at the beginning, but it became more watery and its frequency increased 8–10 times per day. He had no history of fever and denied close contacts with cats and dogs. Antimicrobial treatment against common organisms was not helpful. He was admitted to our clinic because of prolonged diarrhea and abdominal pain. The patient was receiving prednisolone at 5 mg, tacrolimus at 2 × 2 mg, mycophenolic acid at 2 × 720 mg, pantoprazole at 40 mg, and acetylsalicylic acid at 100 mg per day.

Laboratory tests of the patient were as follows: glucose, 144 mg/dL; blood urea nitrogen, 16 mg/dL; creatinine, 1.14 mg/dL; uric acid, 4.4 mg/dL; albumin, 4.1 g/dL; Na, 134 mmol/L; K, 3.3 mmol/L; Ca, 9.7 mg/dL; P, 3.3 mg/dL; tacrolimus level, 7.8 ng/mL; and high-sensitivity C-reactive protein, 0.345 mg/dL. His urine analysis was normal. During microscopic examination of the stool, the *D caninum* eggs were seen (Figs 1–3) but there were no white blood cells in the feces. On diagnosis of dipylidiasis, treatment with niclosamide at 500 mg 4 times a day, for 1 day, was started. The patient's complaints were reduced within 2 days and completely resolved on the 4th day. Stool analysis on the 4th day revealed no

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360 Park Avenue South, New York, NY 10010-1710

0041-1345/15
http://dx.doi.org/10.1016/j.transproceed.2015.05.011

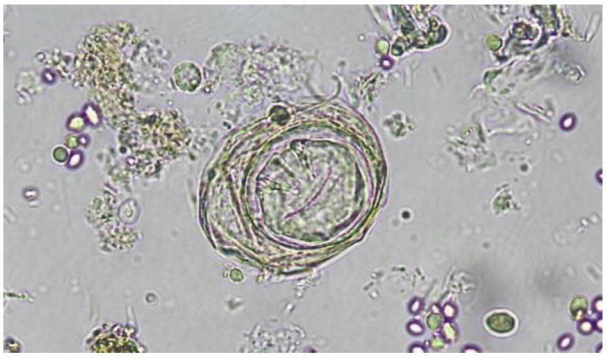

Fig 2. *Dipylidium caninum* egg (Olympus DP21, ×400).

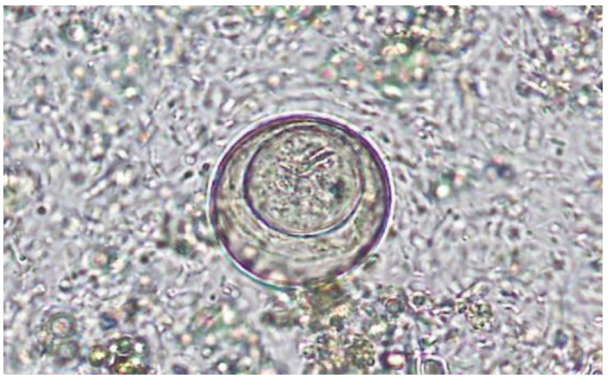

Fig 3. *Dipylidium caninum* egg (Olympus DP21, ×400).

D caninum. The patient was free of complaints on examinations in the 1st and 3rd months after the infection.

DISCUSSION

Entamoeba coli is the most frequent parasitic agent causing infections in kidney transplant recipients. *Isospora belli*, *Blastocystis hominis*, *Giardia lamblia*, and *Endolimax nana* also cause infections in solid transplant recipients [5,6]. Up to now there has been no report of dipylidiasis in kidney transplant patients.

Diarrhea is a frequent complication in kidney transplant recipients, and its differential diagnosis is quite broad, ranging from medication side effects to inflammatory bowel disease and intestinal infections due to various agents. Various studies showed that, in 38%–64% of cases, diarrhea was due to infectious agents. The implicated microorganisms are mostly common pathogens causing diarrhea in the general population, such as *Campylobacter* spp., enterovirulent *Escherichia coli*, *Salmonella* spp., *Clostridium difficile*, *Giardia intestinalis*, norovirus and rotavirus. Although some infections are asymptomatic or self-limited in immunocompetent patients, they become severe in patients with immunodeficiency. However, some pathogens, such as human cytomegalovirus, microsporidia, and cryptosporidia, were more often reported in immunocompromised patients [7].

Until recently, *D caninum* infection has not been reported in healthy adults; almost all of the reported cases are in infants or children [1,2]. It can be speculated that immunosuppression, and perhaps, bad environmental hygiene of the present adult patient could have facilitated the infection.

Human infection with *D caninum* is self-limited, unless there is repeated exposure from the environment. The infection is preventable by keeping pet dogs and cats free of tapeworms and fleas [3].

The treatment of choice for *D caninum* infection is praziquantel. As shown in our case, niclosamide is also effective [7]; 1-day treatment with niclosamide at 500 mg 4 times a day resolved complaints of the patient completely.

As a result, *D caninum* should be considered in differential diagnosis of diarrhea in kidney transplant patients. Niclosamide is quite effective in treatment of dipylidiosis.

REFERENCES

[1] Taylor T, Zitzmann MB. *Dipylidium caninum* in a 4-month-old male. Clin Lab Sci 2011;22:212–4.

[2] Samkari A, Kiska DL, Riddel SW, Wilson K, Weiner LB, Domachowske JB. *Dipylidium caninum* mimicking recurrent *Enterobius vermicularis* (pinworm) infection. Clin Pediatr 2008;47:397–9.

[3] Cabello RR, Ruiz AC, Feregrino RR, Romero LC, Feregrino RR, Zavala JT. *Dipylidium caninum* infection. BMJ Case Reports 2011.

[4] Kotton CN. Zoonoses from dogs. UpToDate.

[5] Naeini AE, Sharifi M, Shadidi S, Taheri S, Seirafian S, Taheri D, et al. Intestinal fungal and parasitic infections in kidney transplant recipients: a multi-center study. Saudi J Kidney Dis Transplant 2012;23:677–83.

[6] Atambay M, Bayraktar MR, Kayabas U, Yilmaz S, Bayindir Y. A rare diarrheic parasite in a liver transplant patient: *Isospora belli*. Transplant Proc 2007;39:1693–5.

[7] Coste JF, Vuiblet V, Moustapha B, Bouin A, Lavaud S, Toupance O, et al. Microbiological diagnosis of severe diarrhea in kidney transplant recipient by use of multiplex PCR assays. J Clin Microbiol 2013;51:1841–9.