

Accepted Manuscript

Title: Chronic Diarrhea in a Traveler: Cyclosporiasis.

Author: Simant Singh Thapa, Buddha Basnyat

PII: S0002-9343(17)30694-0

DOI: <http://dx.doi.org/doi: 10.1016/j.amjmed.2017.06.018>

Reference: AJM 14170

To appear in: *The American Journal of Medicine*



Please cite this article as: Simant Singh Thapa, Buddha Basnyat, Chronic Diarrhea in a Traveler: Cyclosporiasis., *The American Journal of Medicine* (2017), <http://dx.doi.org/doi: 10.1016/j.amjmed.2017.06.018>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

TITLE PAGE

Article Type: Clinical communication to the editor

Title of the manuscript: Chronic diarrhea in a traveler: Cyclosporiasis.

Key words: chronic diarrhea, travelers', cyclosporiasis

Running head: Cyclosporiasis

Authors:

1. **Corresponding author:** Simant Singh Thapa, MD, Department of Internal Medicine, Saint Vincent Hospital, University Of Massachusetts Medical School, Worcester, MA.
2. Buddha Basnyat, MD, FACP, Nepal International Clinic, Travel and Mountain Medicine Center, Kathmandu, Nepal.

Funding: None.

Conflict of Interest: Nothing to disclose.

Authorship: All authors had access to the data and played a role in writing this manuscript.

Consent obtained from patient for publication: Yes.

Requests for reprints should be addressed to corresponding author:

Simant Singh Thapa, MD

Department of Internal Medicine,

Saint Vincent Hospital, University of Massachusetts Medical School, Worcester, MA, 01608.

E-mail address: thapasimant@gmail.com; simant.thapa@stvincenthospital.com

To the Editor:

A 27 year old female presented to a travel medicine clinic with 4 weeks of diarrhea. Her stool was watery with no mucus or blood and she had more than five bowel movements per day. She also complained of severe fatigue, nausea, anorexia, occasional mid-belly cramps and bloating sensation. She denied any history of fever, headache, vomiting, lightheadedness, recent weight changes or urinary symptoms. She had never experienced prolonged diarrhea in the past. She had been travelling around Nepal for the past 4 months. She was initially treated at a primary care center with antibiotics for bacterial diarrhea, followed by antiprotozoal suspecting giardiasis, but her diarrhea persisted. On examination, her vitals were stable. On examination, bowel sound was hyperactive, belly non-tender without hepatosplenomegaly. Microscopic examination of the fresh stool sample revealed Cyclospora oocysts ([Figure 1](#)). Cyclosporiasis was diagnosed and the patient was treated with oral trimethoprim-sulfamethoxazole. On follow-up visit after 2 weeks, patient diarrhea had resolved and her follow-up microscopic stool examination was normal.

Cyclosporiasis is the infection of the intestine caused by the coccidian protozoan organism *Cyclospora cayetanensis*.^{1,2} *Cyclospora cayetanensis* is endemic in many developing countries with the highest rates occurring in Nepal, Haiti, and Peru.³

An acute, non-bloody watery diarrhea associated with profound fatigue is the most striking feature. It can also be accompanied by abdominal cramps, nausea, vomiting, bloating sensation, anorexia, weight loss, and malabsorption.^{1,4} The diarrhea can last for 6 weeks or longer both in immunocompetent and immunosuppressed patients, if left untreated.^{1,5,6}

Diagnosis is made by demonstration of cyclospora oocysts in the feces by direct microscopic examination.^{4,5} Ultraviolet fluorescence microscopy is a useful technique for screening wet mounts of stool sample and to distinguish it from cryptosporidium oocysts. Cyclospora oocysts are autofluorescent and in contrast to cryptosporidium oocysts which are not autofluorescent.^{5,7}

Cyclosporiasis is best treated with trimethoprim-sulfamethoxazole.⁸

Alternative therapies for those allergic to trimethoprim-sulfamethoxazole are lacking. Nitazoxanide, Ciprofloxacin may be an alternative regimen for patients with sulfa allergy.^{9,10} An open trail study about Trimethoprim alone against cyclospora was not significant.¹¹

The *Cyclospora* infection can cause protracted diarrhea for weeks if left untreated and responds best to treatment with trimethoprim-

sulfamethoxazole only, which makes the diagnosis of Cyclosporiasis more crucial.

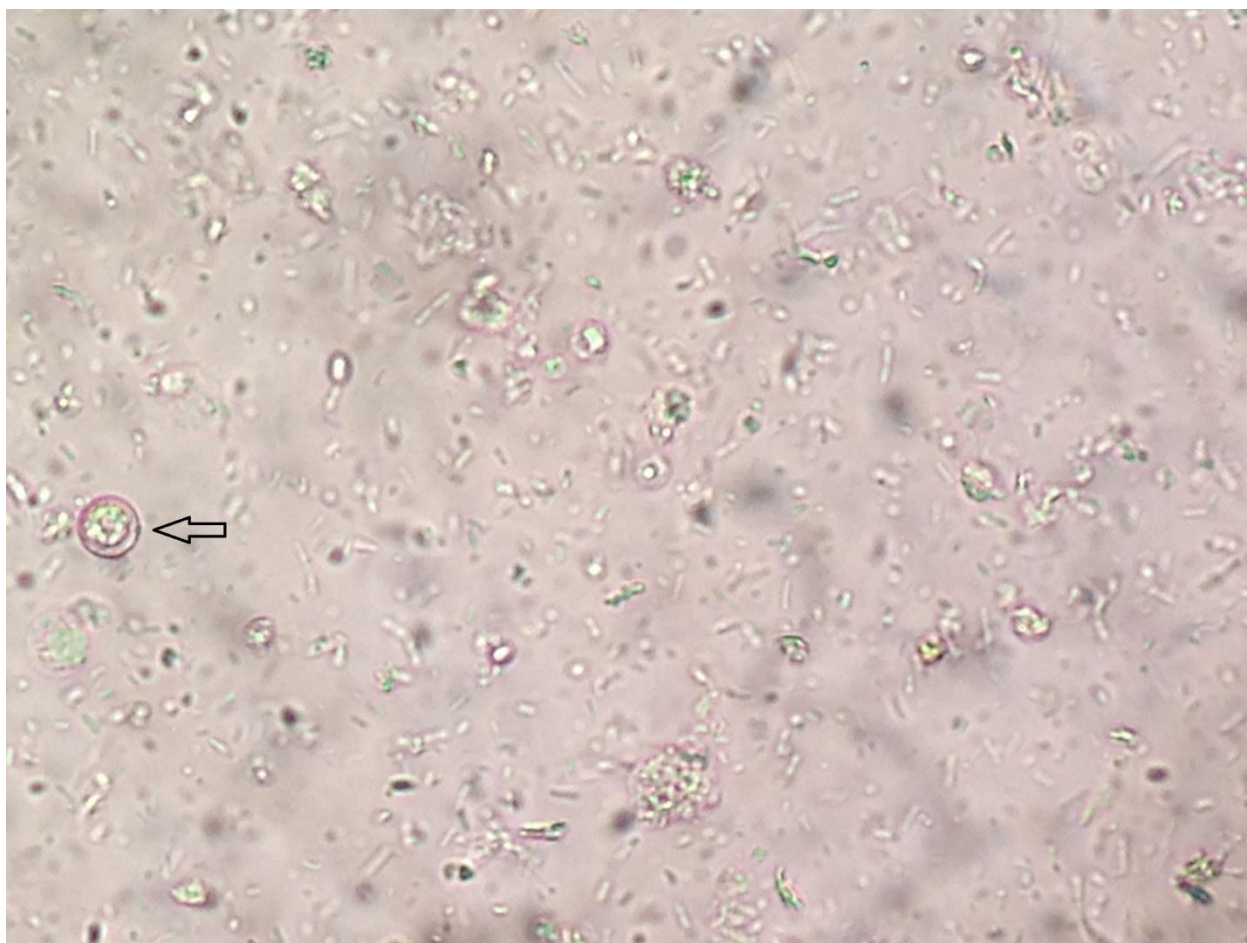
REFERENCES

1. Connor BA. Persistent Travelers' Diarrhea. In: Keystone JS, Kozarsky PE, Freedman DO, Nothdurft HO, Connor BA. Travel Medicine: Expert consult, Elsevier, second edition, 2008; 539.
2. Leonett MM, Figuera L, Nessi A, et al. Diarrhea due to Cyclospora-like organism in an immunocompetent patient. J Infect Developing Countries. 2007; 1(3):345-347.
3. Adachi JA, Backer HD, Dupont HL. Infectious diarrhea from wilderness and foreign travel. In: Auerbach PS. Wilderness Medicine. Mosby, USA: 2007, 5th edition; 1443-1445.
4. Herwaldt BL. Infectious Diseases Related To Travel-Cyclosporiasis. In: Brunette GW. CDC Health Information for International Travel 2014: The Yellow Book. USA: Oxford University Press, USA, 2013, 1st edition; 164.
5. Laison R. Cyclospora and cyclosporiasis. In: Warrell DA, Cox TM, Firth JD. Oxford Textbook of Medicine. USA: Oxford University Press; 2010, 5th Edition; 1105-1108.
6. Connor BA, Shlim DR, Scholes JV, et al. Pathologic changes in the small bowel in 9 patients with diarrhea associated with a coccidian-like body. Ann Intern Med. 1993; 119: 377-382.

7. Ortega YR, Sterling CR, Gilman RH, et al. Cyclospora species: A new protozoan pathogen of humans. N Engl J Med. 1993; 328:1308.
8. Hoge CW, Shlim DR, Ghimire M, et al. Placebo-controlled trial of co-trimoxazole for Cyclospora infections among travelers and foreign residents in Nepal. Lancet. 1995; 345: 691-693.
9. Sánchez-Vega JT, Cabrera-Fuentes HA, Romero-Olmedo AJ, et al. Cyclospora cayetanensis: this emerging protozoan pathogen in Mexico. Am J Trop Med Hyg 2014; 90:351.
10. Verdier RI, Fitzgerald DW, Johnson WD, Pape JW. Trimethoprim-sulfamethoxazole compared with ciprofloxacin for treatment and prophylaxis of isospora belli and Cyclosporacayetanensis infection in HIV-infected patients: a randomized, controlled trial. Ann Intern Med. 2000; 132: 885-888.
11. Shlim DR, Pandey P, Rabold JG et al. An open trial of trimethoprim alone against Cyclospora infections. J Travel Med. 1997; 4: 44-45.

Figure Legends:

Figure 1: The unsporulated Cyclospora oocyst seen under the microscopic examination (arrow). The unsporulated oocysts are uniformly spheroidal with bilayer cell lining and the granular cytoplasm.



Accepted