Symptoms, Negative Tests, and Periodicity in Parasitic Infections

Parasitological investigations of large patient populations are rarely conducted in the United States where the illusion of freedom from parasitic infections still predominate. Such investigations are considerably more common in most third world countries where endemic parasitosis are more readily documented.

Single and concurrent infections of 5 species of protozoans have been diagnosed in 378 symptomatic and asymptomatic patients from 644 samples examined in the summer of 1996 at the Diagnostic and Educational Laboratory (DEL) of the Phoenix based Institute of Parasitic Diseases (IPD) using a concentration-sedimentation technique (Amin, 1997). Fifty-four (8.4%) were infected with *Blastocystis hominis*, 13 (2.0%) with *Cyclospora cayetanensis*, 50 (7.8%) with *Entamoeba coli*, 53 (8.2%) with *E. hartmanni*, 99 (15.4%) with *E. histolytica/E. dispar*, 28 (4.3%) with *Entamoeba spp.*, 9 (1.4%) with *E. coli* and *E. hartmanni*, 53 (8.2%) with *B. hominis* and *Entamoeba spp.*, and 17 (2.6%) with other combinations of protozoan species. More females were represented in the infected, especially the multiply infected, patients than in the uninfected. The patient population varied between 0 and 78 years of age. Very young children were not multiply infected and only adults were infected with *C. cayetanensis*. All single and multiple infections were represented in symptomatic and asymptomatic patients. (Table 1)

Table 1. Prevalence of protozoan infections in stool samples of 644 symptomatic and asymptomatic patients examined during the summer of 1996 at DEL-IPD.

CATEGORIES	NO. TESTED (%) PATIENTS WITH SYMPTOMS	NO. TESTED (%) PATIENTS WITHOUT SYMPTOMS
Single infections	233 (43.8%)	38 (33.9%)
Blastocystis hominis	44 (8.3%)	10 (8.9%)
Cyclospora cayetanensis	10 (1.9%)	3 (2.7%)
Entamoeba coli	47 (8.8%)	3 (2.7%)
E. hartmanni	44 (8.3%)	9 (8.0%)
E. histolytica	88 (16.5%)	11 (9.8%)
Multiple infections (above)	95 (17.8%)	12 (10.7%)
Other combinations	14 (2.6%)	3 (2.7%)
Total infected	328 (61.6%)	50 (44.6%)
Not infected	204 (38.4%)	62 (55.4%)
Total examined	532 (100%)	112 (100%)

Enteric and extra-intestinal symptoms were associated with presumably "harmless commensals" like *E. coli* and *E. hartmanni*. Symptomatic patients infected with *E. histolytica/E. dispar* markedly outnumbered those without symptoms.

It is clear from Table 1 that a number of patients had sub-clinical infections and showed no overt intestinal or extra-intestinal symptoms. These patients have been treated and their overall health improved after having been tested, and their parasites identified, at DEL-IPD.

The most common intestinal symptoms include bloating, diarrhea, flatulence, cramps, constipation, maldigestion, and malabsorption. Less frequently a patient may experience bleeding, irritable bowel, ulcerative colitis, leaky gut, and excess mucus secretion. Extra-intestinal symptoms often include fatigue, allergies, nausea, nervous/sensory disorders (memory loss, brain fog, irritability, poor coordination), skin disorders, pain, and muscle problems. Less frequent extra-intestinal symptoms may include fever, headache, immune deficiency, insomnia, weight changes, respiratory and hepatic symptoms, and peritonitis.

It is also clear from Table 1 that a number of symptomatic patients had no parasites that were detectable from fecal samples provided. These cases are probably related to one or both of the following reasons:

1. Other pathogenic organisms, ex., pathogenic bacteria, can cause symptoms comparable to those produced by typical parasites. These may include enterotoxigenic *Escherichia coli*, Salmonella, Shigella and/or Campylobactor among others; see Paredes et al. (1996). Like the typical parasites, these bacterial parasites are also amenable to treatment with herbal products.
2. Because of the heterogeneous distribution and the cyclic nature of some of the most common human parasites, infections may not be detected in fecal samples if collected when parasites are not running in the main fecal flow; e.g., intervals of many days may intervene between amoebic "runs" which may make the microscopic examination of many stool specimens necessary to confirm a positive *Entamoeba histolytica* infection (Amin, 1994-95; Hiatt et al., 1995; Kelsall and Ravdin, 1994). The same kind of periodicity and/or adherence to the intestinal lining are also known to occur in *Giardia lamblia* (see Amin, 1994-95, Walterspiel and Pickering,

1994) and *Cyclospora cayetanensis* (see Amin, 1998). This explains the intermittent shedding and cyclic recovery of these parasites in fecal samples collected for testing. It is important to test for cyclic parasites when they are "running." The DEL-IPD kit is designed to collect 2 separate fecal samples on 2 different days to maximize parasite recovery rate. On some occasions, however, testing may have to be repeated. ◆

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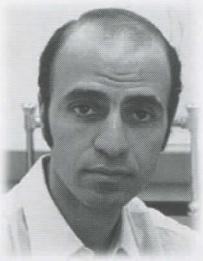

REFERENCES

1. *Amin, O. M. 1994-95. Relationships in parasitology: Parts I, II.* Explore! for the Professional *5(5-6): 5-8, 6(1): 19-22.*
2. *Amin, O. M. 1997. Prevalence and host relationships of intestinal protozoan infections during the summer of 1996.* Explore! for the Professional *8(2): 29-35.*
3. *Amin, O. M. 1998. Seasonal prevalence and host relationships of Cyclospora cayetanensis in North America during 1996.* Parasitology International *47:53-58.*
4. *Hiatt, R. A., E. K. Markell, and E. NG. 1995. How many stool examinations are necessary to detect pathogenic intestinal protozoa?* American Journal of Tropical Medicine and Hygiene *53:36-39.*
5. *Kelsall, B. L. and J. I. Ravdin. 1994. Amebiasis: Human infection with Entamoeba histolytica. In progress in* Parasitology *(Sun, T. Ed.) pp 27-54. CRC Press, Ann Arbor.*
6. *Paredes, P, S. Campbell-Forrester, H. L. DuPont, D. V. Ashley, J. J. Mathewson, S. Thompson, and R. Steffen. 1996. The etiology of travelers diarrhea on a Caribbean Island. Abstract no. 74, 45th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Baltimore, Maryland, (December 1-5).*
7. *Walterspiel, J. N. and L. K. Pickering. 1994. Giardia and giardiasis. In Progress in* Parasitology *(Sun, T. ed.) pp 1-26, CRC Press, Ann Arbor.*

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