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Importance of Multiple Stool Specimens Evaluation by Enzyme Immunoassay in Chronic Giardiasis

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Abstract

Giardiasis is a common cause of enteric parasitic infection. In the duodenum, histologic findings similar to those of celiac disease are seen in giardia infection. Here, we present a patient with polyclonal hypergammaglobulinemia, dermatitis herpetiformis, celiac disease and chronic giardiasis. The patient is a 51-year-old man, who was incidentally found to have a high serum total protein and low albumin levels. The protein electrophoresis showed polyclonal hypergammaglobulinemia and beta gamma bridging. With an elevated erythrocyte sedimentation rate the patient's stool was evaluated and was positive for *giardia lamblia* cysts. The patient failed to respond to the ten-month treatment of Metronidazole, Tinidazole, and Nitazoxanide; and developed a pruritic and blistering maculopapular rash that was diagnosed as dermatitis herpetiformis. Also he was diagnosed with celiac disease with an elevated IgA anti-transglutaminase antibody (56.7 units/mL) and was responsive to gluten-free diet.

Then patient was lost to follow-up for 5 months, and later presented with abdominal pain. The patient underwent endoscopy that showed duodenal mucosa with fissuring and an irregular villous pattern. The patient's fecal specimen was negative for Giardia specific antigens by ProSpecT Giardia Microplate Enzyme Immunoassay, with manufacture reported sensitivity of 99.2% and specificity of 99.6%.

Keywords: *Giardia* microplate enzyme immunoassay; *Giardia lamblia* cysts; Polyclonal hypergammaglobulinemia; Dermatitis herpetiformis; Celiac disease

Introduction

Giardiasis is a common reason for enteric parasitic disease. In the duodenum, histologic discoveries like those of celiac sickness are found in *giardia* disease. Here, we present a patient with polyclonal hypergammaglobulinemia, dermatitis herpetiformis, celiac infection and chronic giardiasis.

Histologic assessment of the duodenal biopsies showed villous blunting and expanded intraepithelial lymphocytes with uncommon *Giardia* organic entities. Although the enzyme immunoassay is delicate and explicit and is viewed as an option in contrast to ordinary assessment for ova and parasites, this case features the requirement for assessment of more than one stool example to recognize the uncommon creatures in chronic giardiasis.

Case Presentation

The patient is a 51-year-old man, who was evaluated three years ago for high serum total protein and low albumin levels. The serum protein electrophoresis showed polyclonal hypergammaglobulinemia and beta gamma bridging. With an elevated erythrocyte sedimentation rate the patient's stool was evaluated, which was positive for *Giardia lamblia* cysts. The patient failed to respond to the ten-month treatment of Metronidazole, Tinidazole, and Nitazoxanide; and developed a pruritic and blistering maculopapular rash which was biopsied and diagnosed as dermatitis herpetiformis. Also he was diagnosed with celiac disease with an elevated IgA anti-transglutaminase antibody (56.7 units/mL) and was responsive to gluten-free diet [1-3]. During the two years, patient's ovum and parasite (O and P) samples were persistently positive for multiple *Giardia lamblia* cysts, and then patient was lost to follow-up for 5 months, and later presented to the emergency department with worsening abdominal pain.

Results

The patient underwent endoscopy that showed nodular and erythematous duodenal bulb, remaining duodenal mucosa with fissuring and irregular villous pattern. The patient's fecal specimen was negative for *giardia* specific antigens by ProSpecT *Giardia* Microplate Enzyme Immunoassay, with manufacture reported sensitivity of 99.2% and specificity of 99.6%. By histology, the duodenal biopsies showed features of celiac disease with villous blunting and increased intraepithelial lymphocytes in Figures 1a and 1b. In addition, there was a rare *Giardia* organism, highlighted by Geimsa histochemical stain shown in Figures 1c and 1d.

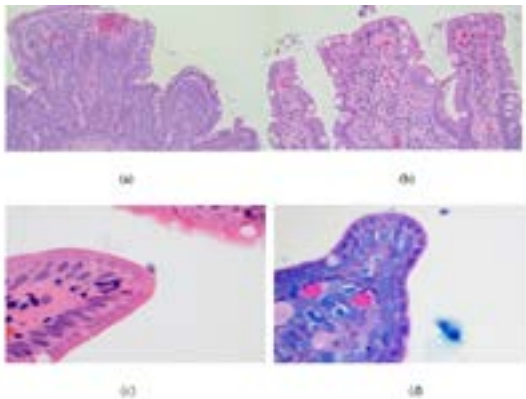

Figure 1: (a,b) Duodenal biopsy with features of celiac disease showing villous blunting (hematoxylin-eosin, original magnifications × 100). (b) Duodenal biopsy with increased intraepithelial lymphocytes at the tips of the villi (hematoxylin-eosin, original magnifications × 200). (c, d) Rare Giardia organisms are seen between the villi (hematoxylin-eosin, geimsa histochemical, original magnifications × 400).

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Discussion

The definite diagnosis of *giardia*sis is dependent on visualization of the organisms on fecal samples, duodenal aspirate or duodenal mucosal biopsies [4,5]. Due to the intermittent or low-level shedding of parasites, the conventional O and P examination on a single stool specimen has a low sensitivity, 74% [6]. There are commercially available products that are rapid and cost-effective, which serve as screening tools that detect *giardia*-specific antigens by Enzyme Immunosorbent Assays (EIA) [7-10]. Although sensitivity of EIA is slightly higher than conventional O and P, examination of at least two specimens either by EIA or microscopy is necessary to achieve a diagnostic sensitivity of greater than 90% [6]. In our patient with chronic giardiasis, the conventional O and P was persistently positive for two years and in the most recent admission the ProSpecT *Giardia* EIA was negative. In literature, the reported negative predictive value for ProSpectT Microplate Assay is 96%-98.1% [8,9]. In patients with increased risk for giardiasis, the negative predictive value of this test is not sufficiently high to exclude *Giardia lamblia* infection on a single stool sample [6]. The negative result in a patient with chronic giardiasis highlights the need for examination of more than one stool specimen for the detection of the rare organisms. In addition, false-positive test results have been reported by ProSpecT assay in grossly bloody samples [11].

The clinical, histology and laboratory findings of celiac disease and giardiasis can overlap. Clinical presentation of abdominal pain and diarrhea are seen in both diseases [12]. The histology features of celiac disease such as villous blunting/atrophy and increased intraepithelial lymphocytes have been reported in cases of giardiasis [13]. In addition, elevation of serum anti-tissue transglutaminase and anti-endomysium antibodies which are associated with celiac disease can be transiently elevated with chronic or recent giardiasis [14]. In rare cases, patients with recurrent giardiasis who present with clinical and pathologic features of celiac disease are found to be suffering from common variable immunodeficiency [15].

Conclusion

In conclusion, it is important to evaluate more than one stool specimen and use of complementary tests for the detection of rare organisms in chronic giardiasis. Although immunoassay is sensitive and specific and is considered an alternative to conventional examination for ova and parasites, it does not eliminate the need to analyze multiple stool samples in patients with moderate or high level of clinical suspicion for *Giardia lamblia* infection. In our case the use of complementary tests, both enzyme immunoassay and duodenal biopsy, helped in appropriate diagnosis.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgement

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