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MARKED EOSINOPHILIA IN *GIARDIA LAMBLIA* INFECTION

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ABSTRACT

Introduction: Eosinophilia, defined as an absolute eosinophil count >500 cells/µl, is most commonly secondary to allergic diseases, infections, or drug reactions. While parasitic helminth infections are a well-recognized cause, protozoal infections are less frequently associated. Reports linking *Giardia lamblia* infection with eosinophilia remain rare, in particular in the context of severe eosinophilia.

Case description: A 77-year-old woman presented with acute watery diarrhoea for 3 days without systemic symptoms. Laboratory evaluation revealed marked eosinophilia (4.5 g/l at initial presentation, which rose to 7.9 g/l). The initial diagnostic workup, including stool polymerase chain reaction for bacterial and viral pathogens, helminth serologies, celiac screening, and abdominal imaging, was all negative. However, endoscopic evaluation with biopsies demonstrated mild eosinophilic gastrointestinal infiltration, and stool antigen testing was positive for *Giardia lamblia*. No other cause of eosinophilia could be identified. Treatment with metronidazole resulted in rapid clinical improvement and progressive reduction of eosinophil counts, with complete normalization during follow-up. Additional investigations only revealed mild hepatopathy, most likely related to statin therapy.

Conclusion: This case highlights *Giardia lamblia* as a potential cause of marked secondary eosinophilia and thus may have to be considered as a differential diagnosis in patients presenting with unexplained severe eosinophilia and gastrointestinal symptoms.

KEYWORDS

Giardiasis, eosinophilia, parasite infection

LEARNING POINTS

- *Giardia lamblia* as a possible cause of severe eosinophilia.

INTRODUCTION

Eosinophilia is defined as an absolute eosinophil count exceeding 500 cells/µl in peripheral blood. According to the degree of elevation, eosinophilia is commonly classified as mild (500–1,500 cells/µl), moderate (1,500–5,000 cells/µl), or severe (>5,000 cells/µl)[1]. In addition, it is classified into primary (clonal), secondary (reactive), and idiopathic aetiologies. Primary eosinophilia is due to hematologic malignancies where eosinophils are part of the neoplastic clone or are driven by aberrant cytokine production. Secondary eosinophilia, the most common form, results from non-neoplastic triggers including allergic diseases,

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infections (particularly helminthic), drug hypersensitivity, autoimmune conditions, and solid tumours. Regarding the incidence geographic variation exists: allergic diseases and drugs predominate in industrialized nations, while parasitic infections lead globally. Idiopathic eosinophilia is diagnosed by exclusion after comprehensive workup and includes idiopathic hypereosinophilic syndrome when persistent unexplained eosinophilia (≥1500/µl) causes organ damage[2,3]. Although numerous parasitic organisms have been associated with eosinophilia, *Giardia lamblia* has only rarely been reported as an etiological agent, with documentation limited to a case series and a small number of case reports[4-7]. *Giardia lamblia* infection therefore is not primarily considered when investigating patients for unexplained moderate to severe eosinophilia.

This case report describes *Giardia lamblia* infection as a possible cause of severe eosinophilia.

CASE DESCRIPTION

A 77-year-old female presented to the emergency department with watery non-bloody diarrhoea for 3 days, without abdominal pain, fever or chills. Her medical history included a recent ischemic stroke for which she was under treatment with aspirin and atorvastatin, and arterial hypertension treated with amlodipine, which was also started 2 months earlier. Prior to admission, she was in good general health and lived independently with her husband. The patient had been on a family trip in the Alps where she ate game meat, but no further risk factors were discovered.

At admission, the patient appeared in good general condition, was afebrile, and hemodynamically stable. Abdominal examination revealed a soft abdomen with normal bowel sounds and no tenderness. Laboratory tests showed mildly elevated C-reactive protein and neutrophilic leucocytosis with marked eosinophilia (4.5 g/l). Manual differential blood count showed no pathological pattern. Stool polymerase chain reaction testing for intestinal bacterial and viral pathogens as well as microbiologic culture were negative, as were celiac disease screening, and helminth serologies. Computed tomography (CT) scan of the abdomen showed no signs of inflammation, apart from mildly distended fluid-filled intestinal loops.

The patient was admitted for further diagnostic evaluation and clinical monitoring. Despite symptomatic treatment with loperamide, no significant clinical improvement was observed. Diarrhoea persisted, with only a slight reduction in frequency. A further increase in eosinophil levels to 7.9 g/l was noted, prompting panendoscopy. No significant macroscopic abnormalities were detected. Histological examination demonstrated mildly increased eosinophilic infiltration of the intestinal tissue in all obtained biopsies, including gastric, duodenal, and colonic samples. Further stool pathogen testing, including evaluation for protozoa, helminths, and schistosomes, was negative. However, stool antigen testing was positive for *Giardia lamblia*, and treatment with metronidazole was initiated.

Under therapy, the patient showed clear clinical improvement, with normalization of stool consistency. Eosinophil counts showed a decreasing trend but had not yet normalized at discharge, 6 days after initiation of treatment *(Fig. 1)*.

During follow-up in the infectious diseases outpatient clinic, a further reduction in eosinophil counts was observed, with complete normalization within 3 months. The patient remained free of clinical symptoms.

Additional etiological investigations were performed for mild hepatopathy, with negative results for viral hepatitis (hepatitis A virus, hepatitis B virus, hepatitis C virus), human immunodeficiency virus, cytomegalovirus, and Epstein-Barr virus. A liver sonography showed steatosis but no other pathology. Drug-induced hepatopathy secondary to atorvastatin was considered the most likely cause.

DISCUSSION

This case report highlights *Giardia lamblia* as a possible cause of moderate to severe eosinophilia in the setting of acute watery diarrhoea. The association was considered highly likely because Giardia was the only positive

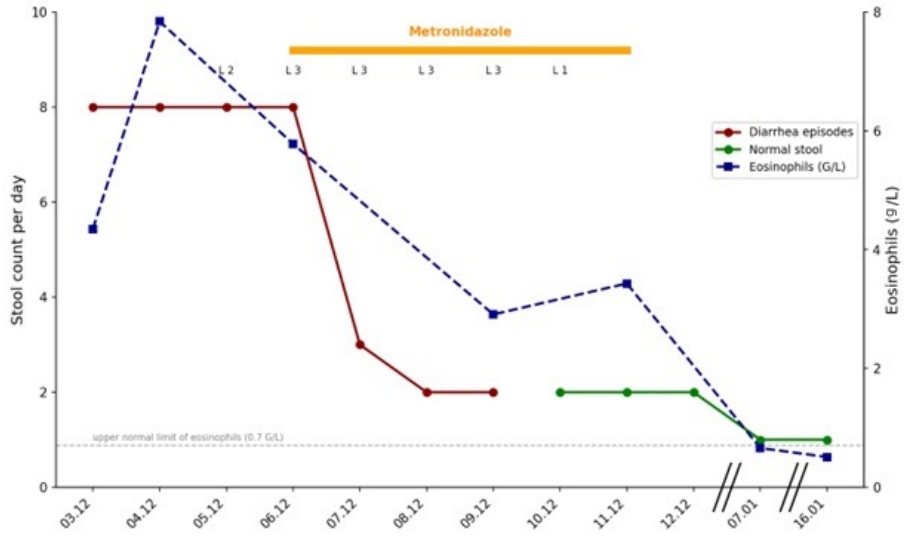


Figure 1. Temporal summary of symptoms, treatment and eosinophil level (L, number of loperamide pills, in yellow each day of treatment with metronidazole).

diagnostic finding, and both, clinical symptoms and eosinophil count improved following targeted therapy. Indeed, complete normalization of eosinophil levels was observed after treatment.

Previous reports and case series of patients with marked eosinophilia have rarely identified *Giardia lamblia* as an underlying cause. In one cohort of 193 patients with absolute eosinophil counts exceeding 5,000 cells/µl, no cases of giardiasis were reported[8]. Conversely, in a separate series of 66 patients with confirmed giardiasis, eosinophilia was observed in approximately 45% of cases. However, the elevation was predominantly mild and only occasionally reached the moderate range. The highest absolute eosinophil count described in that series was approximately 2,400 cells/µl[5].

To our knowledge, only one case has been reported to date in which giardiasis was associated with severe eosinophilia (>5,000 cells/µl). Therefore, giardiasis accompanied by severely high eosinophil levels as described in our report seems to be extremely rare[6].

Nevertheless, our finding indicates that giardiasis should be considered in the differential diagnosis of severe eosinophilia, particularly in patients presenting with compatible gastrointestinal symptoms.

Initial diagnostic screening also revealed mildly elevated liver enzymes. After exclusion of infectious causes and normal liver imaging (CT and ultrasound), hepatopathy was attributed to statin therapy, which had been initiated 2 months earlier. A causal relationship between hepatopathy and Giardia infection has not been described in the literature.

In summary, we describe a case of acute watery diarrhoea with severe eosinophilia due to Giardia lamblia infection, that completely resolved after treatment with metronidazole. Thus, *Giardia lamblia* infection may have to be considered as a differential diagnosis in patients presenting with unexplained moderate to severe hypereosinophilia and gastrointestinal symptoms.

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