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CASE REPORT

Strongyloides Infection in a Man with Abdominal Pain and a History of Rheumatoid Arthritis

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Abstract:

Background:

Strongyloidiasis is self-limited by the complete immune system, it may be complicated and causes hyperinfection in immunocompromised patients. Objective: Here, we report a case of an immunocompromised patient with duodenal involvement of *Strongyloides stercoralis*.

Case Report:

A 65-year-old man presented with severe pain in central abdomen and periumbilical regions. He had no history of alcohol consumption, smoking and surgery but the history of RA (Rheumatoid Arthritis) and hypothyroidism taking immunosuppressive medications. The patient underwent endoscopy and colonoscopy which pathological analysis of the biopsies revealed remarkable findings in favor of Strongyloidiasis. After two consecutive day's consumption of ivermectin 200µg/kg, the symptoms were completely removed. Also, the stool examination was negative for *S. stercoralis* larvae two weeks after end of the treatment.

Conclusions:

It seems that in immunocompromised patients with gastrointestinal symptoms assumption of parasite-like infections such as Strongyloidiasis should be considered as one of the diagnosis options. Due to the physiological and gut microbial alternations, these patients are more susceptible to infectious diseases.

Keywords: Colonoscopy, Gut microbiome, Hyperinfection, Ivermectin, Rheumatoid arthritis, *Strongyloides stercoralis*.

1. INTRODUCTION

Strongyloidiasis which approximately infects 100 million people worldwide is a parasitosis caused by intestinal nematode *Strongyloides stercoralis* with the common cause of abdominal pain and diarrhea [1, 2]. Though this infection is self-limited by the complete immune system, it may be complicated and cause hyperinfection in immunocompromised patients [3, 4]. Also, it seems that the interactions of gut microbiome [5 - 7], pathological mechanisms, host defense pathways and effect of systemic corticosteroids [8] impacts on its manifestations. There are several desirable parasitological diagnostic methods in detection of *S. stercoralis* in particular among immunosuppressed patients such as serological and molecular tools [9]. As *S. stercoralis* colonize in the duodenum, in certain situations the diagnosis by endoscopy and biopsy may be essential for the diagnosis of this parasitosis thus reducing the risk of death of the hosts in cases of immunosuppression [10 - 12]. Here, we report a case of an immunocompromised patient with involvement of the duodenum by *S. stercoralis*.

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2. CASE REPORT

A 65-year-old male with a history of RA (rheumatoid arteritis) and hypothyroidism taking immunosuppressive medications such as corticosteroid and hydroxychloroquine was admitted to the Internal Medicine Department of Razi Hospital in Rasht (a city in northern Iran). About 3 weeks ago, severe pain appeared in the central abdomen and periumbilical region which its intensity was not altered with feeding, defecation, and positional changes. A decreased appetite and constipation were added to the symptoms. Also, he complained of repeated vomiting containing the eaten food. In addition, he had about 4-5 kg weight loss. He had no history of alcohol consumption, smoking, and surgery. Clinical examinations of pulmonary were normal.

Initial blood laboratory tests revealed WBC: $8.3 \times 10^3/\text{UL}$ ($4-10 \times 10^3/\text{UL}$), MCV: 89.9 (80-100 FL), MCHC: 30.6 (31-37 gr/dL), PLT: $613 \times 10^3/\text{UL}$ ($150-450 \times 10^3/\text{UL}$), Ferritin: 610 (12-300 ng/mL), Alb: 3 (3.5-5 g/dL), K: 2.4 (3.5-5.3 mEq/L), Na: 122 (135-145 mEq/L), ESR: 21 (0-22 mm/hr), CRP: 3+ (<6 mg/L), Bill T: 1.1(0-1.1 mg/dL), Bill D: 0.3 (0-0.7 mg/dL), Cr: 16 (0.8-1.3 mg/dL), Total Pr: 5.1 (6.6-8.8 gr/dL), Ca: 6.9 (8.5-10.5 mg/dL), Fe: 64 (13.5-17.5 g/dL), TIBC: 131(240-450 mcg/dL).

At the next step, endoscopy showed esophageal candidiasis (Fig. 1a), bile secretion in the stomach (Fig. 1b and 1c), severe erythema in the body and antrum (Fig. 1c and 1d) as well as multiple ulcers in D1 (proximal horizontal 5 cm beginning with the 3-cm duodenal bulb) and D2 (descending) (Fig. 1e, f, g). In the colonoscopy, the internal hemorrhoid grade 1, multiple diverticula in the sigmoid cecum and severe erythema with multiple ulcerations extended from descending colon to the cecum was observed (Fig. 2). During endoscopy and colonoscopy the biopsies were taken. The pathological analysis of three distinct biopsies including gastric, colonic and duodenal mucosa revealed remarkable findings. The gastric mucosa showed focal erosion, surface irregularity with mixed inflammatory cells infiltrated in lamina propria. Focal erosion, surface irregularity with mixed inflammatory cells infiltrated in lamina propria demonstrated in gastric mucosa. Furthermore, some *S. stercoralis* larvae were found in gastric pits with the mild colonization of *H. pylori* (Fig. 3). The colonic mucosa sample revealed ulceration and granulation tissue formation with focal crypt distortion, cryptitis, and focal crypt abscess formation. The lamina propria contained an increase in inflammatory cells rich in eosinophil and some pigment-laden macrophages as well as some parasite-like structures (Fig. 4). The last biopsy which was from duodenal mucosa showed the infiltration of mixed inflammatory cells in lamina propria and few *S. stercoralis* larva in crypts (Fig. 5). The diagnosis was strongyloidiasis according to the gastric and duodenal mucosal biopsy (D2), while the colonic mucosa biopsy just stated mucosal ulceration and eosinophil-rich in chronic active colitis, parasite-like structures, and deposition of pigment. The patient was taken ivermectin 200µg/kg for two consecutive days and the symptoms were totally removed. Also, the stool examination was negative for *S. stercoralis* larvae two weeks after end of the treatment.



Fig. (1). Endoscopy revealed (a): esophageal candidiasis *Los Angeles* (LA) grade B, (b and c): bile secretions in stomach, (c and d): severe erythema, (e, f, g): severe ulceration in D1 & D2.

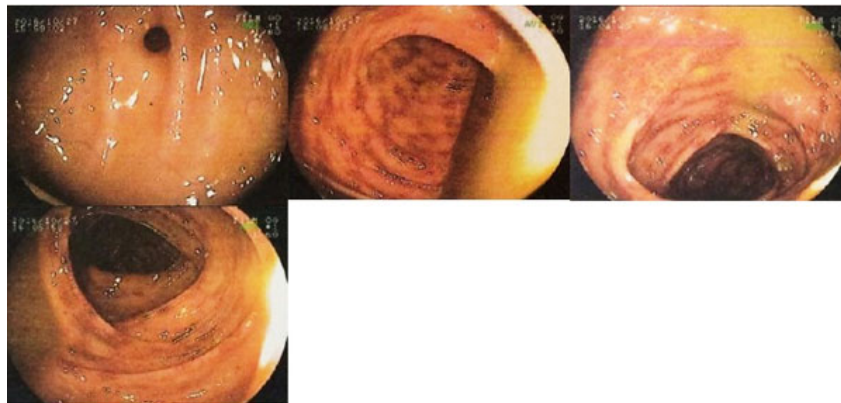


Fig. (2). Colonoscopy with multiple diverticula in sigmoid up to cecum along with severe erythema and ulceration in descending to cecum.

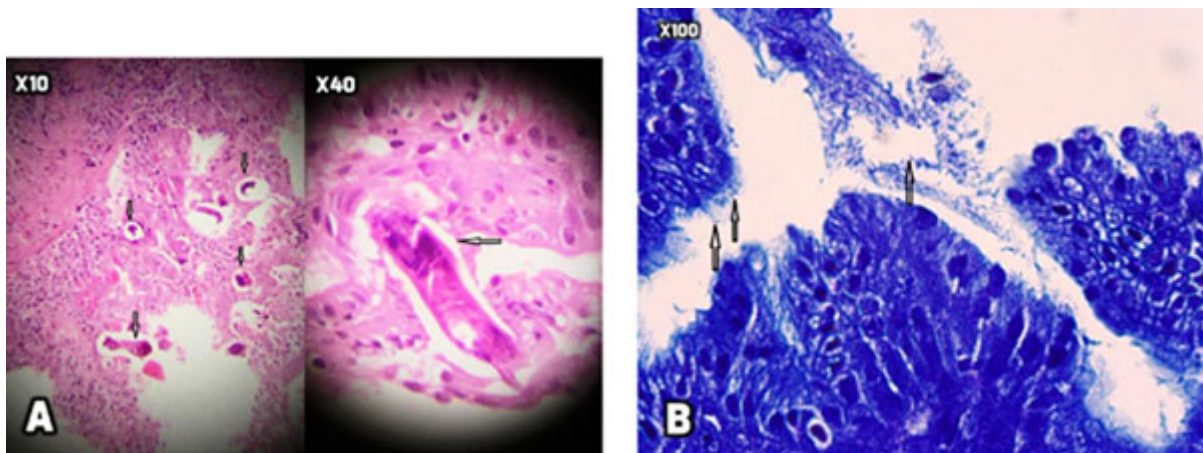


Fig. (3). Gastric mucosa showed focal erosion, surface irregularity with mixed inflammatory cells infiltrated in lamina propria. Also, some *S. stercoralis* larvae (A) were found in gastric pits with the mild colonization of *H. Pylori* (B). The figures shown in increases of 10, 40 and 100 times.

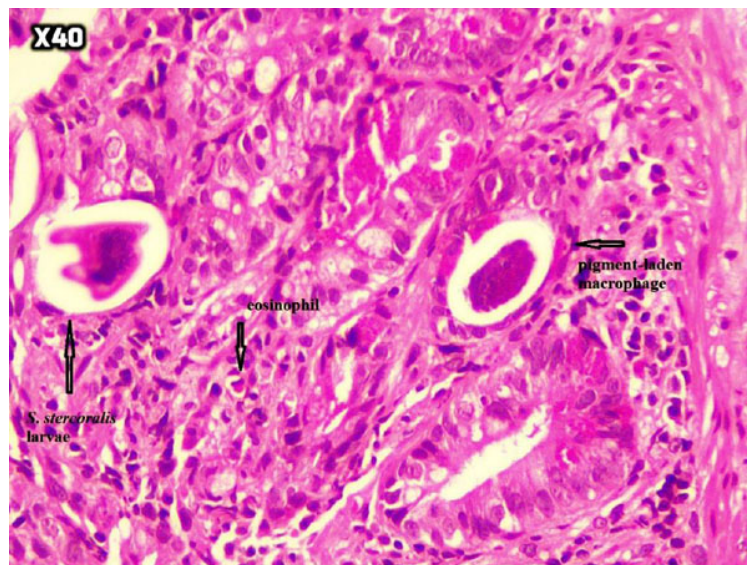


Fig. (4). Ulceration and granulation tissue formation with focal crypt distortion, cryptitis, and focal crypt abscess formation with increase in inflammatory cells rich in eosinophil and some pigment-laden macrophages as well as some parasite-like structures (H&E x40).

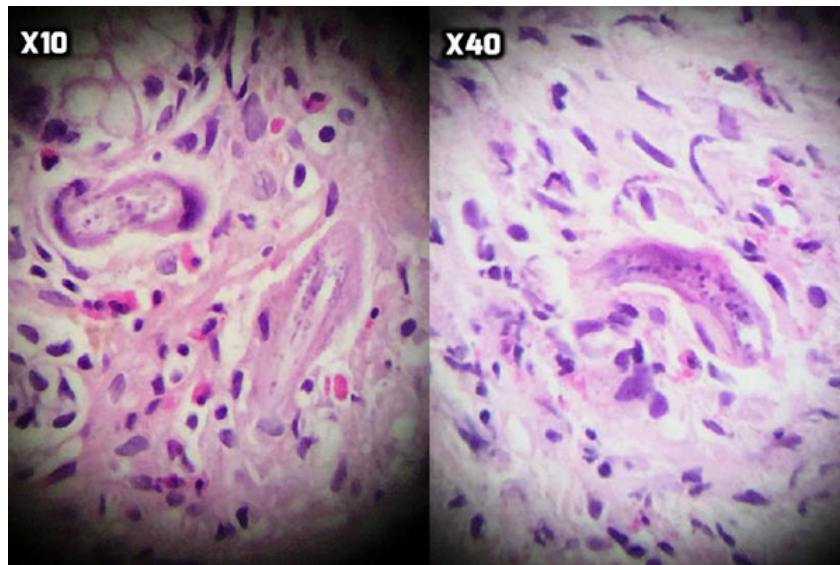


Fig. (5). Duodenal mucosa showed the infiltration of mixed inflammatory cells in lamina propria and few *Strongyloides* larva in crypts (H&E x10, x40).

3. DISCUSSION AND CONCLUSION

S. stercoralis Infection has a long past history [13] which mostly is linked to the suppressed status of the immune system [14, 15]. The increased worms are detectable in extraintestinal sites, especially the lung in hyperinfection syndrome [16] which involves patients with impaired cellular immunity such as those receiving long-term steroids, HTLV-1 and HIV-infected patients, and those with hematologic malignancies, transplant recipients [16]. COPD which its exacerbations might be mimicked by pulmonary strongyloidiasis is the most reason of corticosteroids receiving in patients who develop hyperinfection syndrome [16 - 18]. The occurrence of hyperinfection syndrome may be as early as 20 days after the onset of corticosteroid therapy [19] and as late as several years [20].

A combination of gastrointestinal, pulmonary and constitutional symptoms are the common manifestations. Also, severe cramping, abdominal pain, watery diarrhea, weight loss, nausea, vomiting, occasionally gastrointestinal bleeding and small bowel obstruction are considered as intestinal manifestations [3]. Asthma-like symptoms such as cough and wheezing, and others such as pneumonia, pulmonary hemorrhage, pleural effusion, and acute respiratory failure are founded as its pulmonary manifestations [3, 21]. Hyperinfection may be complicated by bacterial infections and bacteremia caused by gut flora [7].

Although the diagnosis of strongyloidiasis is definitely based on larvae detection in stool or sputum [16, 22], it is not as adequate as other methods such as blood agar plate culture [16, 23], duodenal fluid sampling and serologic testing [16, 24]. However, it should be considered that depending on the serological test employed the sensitivity and specificity may be low and culminate in cross reactivity. Along with some effective drugs such as albendazole, mebendazole, thiabendazole, and ivermectin for *S. stercoralis* infection according to the more studies in the treatment of *strongyloidiasis*, ivermectin is the drug of choice [25, 26]. Monitoring the response to treatment could be very difficult with detection of *S. stercoralis* larvae in the stool specimen because of the inconsistent shedding of the larvae.

In our case which was suspected of hyperinfection syndrome, in contrast to other reported cases, there were no pulmonary manifestations. However, the gastrointestinal manifestations according to the gastric and colonic biopsies lead us to diagnose this infection. As regard as, biopsy is not preferable to an invasive method there was no way to distinguish of this by stool examination or bacterial culture. As it is mentioned that it may be unreasonable to screen immunocompromised patients from endemic areas by serology before initiating steroid therapy to prevent the development of *Strongyloides* hyperinfection, screening is not recommended for patients before starting short courses of corticosteroids for bronchial asthma or COPD, but it may be considered in severe cases of bronchial asthma or COPD requiring recurrent and frequent steroids courses [27].

According to our case, it is recommended to notice that the physicians should consider the suspicion of *Strongyloides* in immunosuppressive patients. This patient who had RA along with hypothyroidism the reduction of

metabolism and complicated alterations of gut microflora may explain the hyper infection. As recently it is stated that microbiome has an important impact on the cellular interactions in which its weakness may explain the cause of *S. stercoralis*. Also, it seems that in accordance with the other studies ivermectin is still an appropriate choice of treatment. The patient was cured without any relapse according to the negative stool examinations in a two-week follow-up.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No animals/humans were used for studies that are the basis of this research.

CONSENT FOR PUBLICATION

A written informed consent was obtained from all the patients when they were enrolled.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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REFERENCES

- [1] Puthiyakunnon S, Boddu S, Li Y, *et al.* Strongyloidiasis-An insight into its global prevalence and management. *PLoS Negl Trop Dis* 2014; 8(8): e3018. [<http://dx.doi.org/10.1371/journal.pntd.0003018>] [PMID: 25121962]
- [2] Schär F, Trostorf U, Giardina F, *et al.* Strongyloides stercoralis: Global distribution and risk factors. *PLoS Negl Trop Dis* 2013; 7(7): e2288. [<http://dx.doi.org/10.1371/journal.pntd.0002288>] [PMID: 23875033]
- [3] Keiser PB, Nutman TB. Strongyloides stercoralis in the immunocompromised population. *Clin Microbiol Rev* 2004; 17(1): 208-17. [<http://dx.doi.org/10.1128/CMR.17.1.208-217.2004>] [PMID: 14726461]
- [4] Tabei SZ, Asadian F, Fakhar M, Safaei A. Gastrointestinal hyper infection due to Strongyloides stercoralis in a patient with Behcet's syndrome. *Comp Clin Pathol* 2009; 18(1): 89. [<http://dx.doi.org/10.1007/s00580-008-0750-2>]
- [5] Zaiss MM, Harris NL. Interactions between the intestinal microbiome and helminth parasites. *Parasite Immunol* 2016; 38(1): 5-11. [<http://dx.doi.org/10.1111/pim.12274>] [PMID: 26345715]
- [6] Chokkalingam Mani B, Mathur M, Clauss H, *et al.* Strongyloides stercoralis and organ transplantation. *Case reports in transplantation* 2013.
- [7] ARCHIBALD SC, Sunderland D, Ashford RW, Hart CA Bacterial infections in patients with the hyperinfection syndrome: interactions between strongyloides larvae and gut bacteria. Portland Press Limited 1989.
- [8] Vadlamudi RS, Chi DS, Krishnaswamy G. Intestinal strongyloidiasis and hyperinfection syndrome. *Clin Mol Allergy* 2006; 4(1): 8. [<http://dx.doi.org/10.1186/1476-7961-4-8>] [PMID: 16734908]
- [9] Paula FM, Malta FM, Corral MA, *et al.* Diagnosis of Strongyloides stercoralis infection in immunocompromised patients by serological and molecular methods. *Rev Inst Med Trop São Paulo* 2016; 58: 63. [<http://dx.doi.org/10.1590/S1678-9946201658063>] [PMID: 27680168]
- [10] Mejia R, Nutman TB. Screening, prevention, and treatment for hyperinfection syndrome and disseminated infections caused by Strongyloides stercoralis. *Curr Opin Infect Dis* 2012; 25(4): 458-63. [<http://dx.doi.org/10.1097/QCO.0b013e3283551dbd>] [PMID: 22691685]
- [11] Randale A, Dani A, Chawhan S, Meshram S, Tathe S, Kumbhalkar D. A case report of Strongyloides stercoralis duodenitis in an immunocompromised patient. *Parasitol United J* 2015; 8(2): 127. [<http://dx.doi.org/10.4103/1687-7942.175011>]
- [12] Tarlow M, Schwartz R. Strongyloidiasis. 2004.
- [13] Genta RM. Global prevalence of strongyloidiasis: critical review with epidemiologic insights into the prevention of disseminated disease. *Rev Infect Dis* 1989; 11(5): 755-67. [<http://dx.doi.org/10.1093/clinids/11.5.755>] [PMID: 2682948]
- [14] Cruz T, Reboucas G, Rocha H. Fatal strongyloidiasis in patients receiving corticosteroids. *N Engl J Med* 1966; 275(20): 1093-6. [<http://dx.doi.org/10.1056/NEJM196611172752003>] [PMID: 5925209]

- [15] Rogers WA Jr, Nelson B. Strongyloidiasis and malignant lymphoma. "Opportunistic infection" by a nematode. *JAMA* 1966; 195(8): 685-7. [<http://dx.doi.org/10.1001/jama.1966.03100080125044>] [PMID: 5951773]
- [16] Siddiqui AA, Berk SL, Siddiqui AA, Berk SL. Diagnosis of *Strongyloides stercoralis* infection. *Clin Infect Dis* 2001; 33(7): 1040-7. [<http://dx.doi.org/10.1086/322707>] [PMID: 11528578]
- [17] Berk SL, Verghese A, Alvarez S, Hall K, Smith B. Clinical and epidemiologic features of strongyloidiasis. A prospective study in rural Tennessee. *Arch Intern Med* 1987; 147(7): 1257-61. [<http://dx.doi.org/10.1001/archinte.1987.00370070071011>] [PMID: 3606282]
- [18] Wehner JH, Kirsch CM, Eds. Pulmonary manifestations of strongyloidiasis. *Semin Respir Infect* 1997; 12(2): 122-9.
- [19] Debussche X, Toublanc M, Camillieri JP, Assan R. Overwhelming strongyloidiasis in a diabetic patient following ACTH treatment and ketoacidosis. *Diabete Metab* 1988; 14(3): 294-8. [PMID: 2842205]
- [20] Rivera E, Maldonado N, Vélez-García E, Grillo AJ, Malaret G. Hyperinfection syndrome with *Strongyloides stercoralis*. *Ann Intern Med* 1970; 72(2): 199-204. [<http://dx.doi.org/10.7326/0003-4819-72-2-199>] [PMID: 4904675]
- [21] DeVault GA Jr, King JW Jr, Rohr MS, Landreneau MD, Brown ST III, McDonald JC. Opportunistic infections with *Strongyloides stercoralis* in renal transplantation. *Rev Infect Dis* 1990; 12(4): 653-71. [<http://dx.doi.org/10.1093/clinids/12.4.653>] [PMID: 2201067]
- [22] Uparanukraw P, Phongsri S, Morakote N. Fluctuations of larval excretion in *Strongyloides stercoralis* infection. *Am J Trop Med Hyg* 1999; 60(6): 967-73. [<http://dx.doi.org/10.4269/ajtmh.1999.60.967>] [PMID: 10403329]
- [23] Gutierrez Y. Diagnostic pathology of parasitic infections with clinical correlations. USA: Oxford University Press 2000.
- [24] Siddiqui AA, Koenig NM, Sinensky M, Berk SL. *Strongyloides stercoralis*: Identification of antigens in natural human infections from endemic areas of the United States. *Parasitol Res* 1997; 83(7): 655-8. [<http://dx.doi.org/10.1007/s004360050314>] [PMID: 9272553]
- [25] Gann PH, Neva FA, Gam AA. A randomized trial of single- and two-dose ivermectin versus thiabendazole for treatment of strongyloidiasis. *J Infect Dis* 1994; 169(5): 1076-9. [<http://dx.doi.org/10.1093/infdis/169.5.1076>] [PMID: 8169394]
- [26] Pitisuttithum P, Supanaranond W, Chindanond D. A randomized comparative study of albendazole and thiabendazole in chronic strongyloidiasis. *Southeast Asian J Trop Med Public Health* 1995; 26(4): 735-8. [PMID: 9139386]
- [27] Al Maslamani MA, Al Soub HA, Al Khal ALM, Al Bozom IA, Abu Khattab MJ, Chacko KC. *Strongyloides stercoralis* hyperinfection after corticosteroid therapy: A report of two cases. *Ann Saudi Med* 2009; 29(5): 397-401. [<http://dx.doi.org/10.5144/0256-4947.2009.397>] [PMID: 19700900]