

Ancylostomiasis: a rare cause of gastrointestinal bleeding and severe anemia

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Abstract

Anemia is characterized by low levels of hemoglobin. In Colombia, anemia affects 27.7% of the population. The most seriously affected populations are preschool children, women of reproductive age, pregnant women and the elderly. **Clinical case:** Upon admission, the 58-year-old patient was found to have a condition compatible with cardiomegaly and redistribution of blood flow and required a blood transfusion. Additional studies suggested that digestive hemorrhaging due to ancylostomiasis could be the cause. Treatment with anthelmintics was begun and had good clinical and paraclinical results. **Discussion:** Acquisition of this parasite, considered to be a forgotten cause of digestive bleeding, is associated with multiple risk factors. In some cases, there are severe consequences such as cardiomegaly and redistribution of blood flow. The effectiveness of treatment with anthelmintics ranges between 62% and 92%.

Keywords

Ancylostomiasis, anemia, iron deficiency, helminths, intestinal parasitosis.

INTRODUCTION

Anemia is characterized by low levels of hemoglobin, the protein that is the main component in erythrocytes. It is essential for their proper functioning and is synthesized in the bone marrow. (1)

Epidemiologically, it is estimated that 1.6 billion people in the world have anemia. (2) In Colombia, it affects 27.7% of the population: about 15 million people out of the country's population of 48,700,000 have some degree of anemia. (3)

The most severely affected populations are preschool children, women of reproductive age, pregnant women and elderly people. (1, 3, 4) Anemia's multiple causes include malnutrition, micro nutrient and macronutrient deficiencies, iron deficiency, plant-based diets, hemoglobin pathologies, (5) malaria, intestinal parasitosis, and gastrointestinal bleeding. (6)

In this article, we present the clinical case of a patient who presented severe anemia secondary to gastrointestinal bleeding due to ancylostomiasis.

CLINICAL CASE

A 58-year-old farmer came to the hospital after five days of moderate to severe abdominal pain located in the mesogastrium associated with hyporexia, asthenia and adynamia but which did not radiate. He also reported that he had suffered trauma to his lower right leg which had caused pain and limited his ability to walk.

Vital signs found during physical examination were as follows: heart rate (HR): 125 beats per minute, respiratory rate (RR): 24 breaths per minute (BPM), blood pressure: 130/87, temperature: 36.7, and body mass index (BMI): 18.3 kg/m². The patient was pale and had intercostal retractions and rales in his lung segments. On superficial palpa-

tion of the mesogastrium, he experienced pain with voluntary muscular defense. Patient had no signs of peritoneal irritation, erythema, or edema. He also had no sign of heat in the internal malleolus of his lower right leg.

Paraclinical tests performed at admission (Table 1) showed hypochromic microcytic anemia with anisocytosis. His clinical picture suggested cardiomegaly and redistribution of blood flow. After reviewing the results, it was decided to transfuse two units of red blood cells.

Table 1. Paraclinical tests performed at admission

Diagnostic test	Result	Reference
Leukocytes	10.4 × 10 ⁹ /L	4.5 to 11.0 × 10 ⁹ /L
Neutrophils	80 %	Up to 85 %
Eosinophils	3 %	Up to 5 %
Hemoglobin	6.0 g/dL	13 to 16 g/dL
Hematocrit	17.5 %	36% to 52 %
MCV	60 fL	80 to 100 fL
MCHC	23.3 g/dL	27 to 32 g/dL
RDW	20.30 %	0% to 16 %
Platelets	356 × 10 ⁹ /L	150 to 450 × 10 ⁹ /L
Creatinine	0.93 mg/dL	Up to 1.2 mg/dL
PT	16 s	9 to 16 s
PTT	33.4 s	25 to 35 s

MCHC: mean corpuscular hemoglobin concentration; PT: prothrombin time; PTT: partial thromboplastin time; RDW: red blood cell distribution width; MCV: mean corpuscular volume.

The next day the patient's condition improved with vital signs within the normal range: HR: 90 bpm, RR: 18 bpm, and BP: 122/72. His post-transfusion blood count showed an increase in serum hemoglobin values. Complementary studies were then done to determine the cause of anemia (Table 2).

Table 2. Follow-up paraclinical tests and extension studies

Diagnostic tests	Results	Reference
Hemoglobin	8.4 g/dL	13 to 16 g/dL
Hematocrit	25%	36% to 52%
MCV	62.2 fL	80 to 100 fL
MCHC	26.4 g/dL	27 to 32 g/dL
RDW	22.30%	0% to 16%
Peripheral blood smear	Normal	Normal
Ferritin	82 ng/mL	12 a 150 ng/mL
Transferrin	400 mg/dL	170 a 370 mg/dL
Fecal occult blood	Positive	Negative
Direct Coombs test	Negative	Negative
Reticulocyte count	3.36%	0.3% to 4.5%

A colonoscopy was normal, and the only finding from a total abdominal ultrasound was a moderate splenomegaly (160 x 92 mm). Upper endoscopy found a hiatal hernia without esophagitis and duodenal ancylostomiasis (Figure 1).

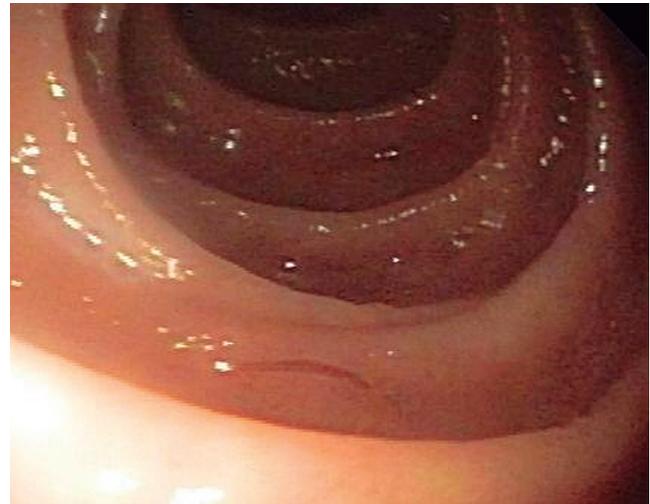


Figure 1. Upper digestive endoscopy shows duodenal ancylostomiasis.

When the patient was questioned about risk factors, he mentioned that his drinking water came from a deep well, he did not have adequate hand hygiene, and his socioeconomic condition was irregular because he was living in a rural area.

We considered that the patient was suffering from iron deficiency anemia secondary to hemorrhaging of his digestive tract due to ancylostomiasis. We decided to treat him on an outpatient basis with two 400 mg doses of albendazole supplemented with 300 mg of ferrous sulfate every 12 hours and 500 mg of cephalexin every 6 hours to treat the infection in his lower right leg.

At his one month follow up the patient's condition had improved. Physical examination showed adequate general conditions with vital signs within the normal range, no signs of anemia, and normal hemoglobin values in the control blood count.

DISCUSSION

Ancylostomiasis can be caused by either *ancylostoma duodenale* (old world hookworm) or *necator americanus* (new world hookworm), the latter of which is typical of tropical areas. Approximately 31% of the people who live in these areas have intestinal parasitosis. (7) This tropical disease's economic burden ranges from 7.5 to 138.9 billion pesos per year. (8)

Risk factors associated with the acquisition of these parasites include personal hygiene, consumption of contamina-

ted water, housing in rural areas, being barefoot, engaging in agricultural work, malnutrition and blood type A. (9, 10) The patient in the case presented here had several of these risk factors.

The parasite can enter the body in either of two ways. Most often its larvae penetrate the skin, migrate through the circulatory system to the lungs, and ascend through the respiratory tract until they reach the digestive tract. However, they can also be acquired orally. When they are, there is no associated pulmonary cycle so they affect only the small intestine. (11) Once the parasites are in the small intestine, they cause blood loss due to suction or intestinal ulcers. (6) These losses amount to 0.3 to 60 mL per day which is why ancylostomiasis is considered to be a cause of digestive bleeding. (12, 13)

Twenty-two percent of ancylostomiasis patients may have anemia. Of these, only 1.9% develop severe anemia (<7 mg/dL) which is why it is considered infrequent. (14)

The clinical picture of ancylostomiasis can include abdominal pain, hyporexia, asthenia, adynamia, malnutrition, drum stick fingers and anemia. (15) Anemia decreases oxygen transport capacity which results in activation of compensatory mechanisms such as increase production of 2,3-Bisphosphoglyceric acid and overproduction of erythropoietin to conserve tissue oxygenation. When levels fall below 10 g/dL, increased sympathetic activity produces an increase in cardiac output, which can result in tachycardia and hypertension, and a decrease in blood viscosity which can cause pleural effusions and eventually produce respiratory distress. In the long term, this leads to a remodeling of the left ventricle, and it can trigger heart failure. These changes are included in the concept of cardiomegaly and redistribution of blood flow. (16)

Splenomegaly can occur as a result of hyperplasia of cells of the mononuclear phagocyte system (MPS) associated with the infectious process or secondary to cardiomegaly and redistribution of blood flow. (17)

This entity should be suspected in patients from rural areas, especially if they have digestive symptoms, eosinophilia (present in 30% to 50% of cases) or anemia. (18) The latter is characterized by microcytosis, hypochromia, anisocytosis and elevated reticulocytes, (15) all of which were found in the tests performed on our patient.

Diagnosis requires clinical suspicion and is made by identifying the parasites' eggs in a stool test. Nevertheless, a direct stool exam has low sensitivity, so analysis of three samples for three consecutive days is recommended. On rare occasions including this case, the parasite can be visualized in the small intestine during the performance of standard endoscopic studies. (19)

The use of albendazole in doses of 400 mg/day is effective for community deworming which reduces the preva-

lence of helminthiasis. (20) Mebendazole in 100 mg doses twice a day for 3 days can also be used. The success of the treatment varies between 69% and 92% depending on the regimen used. (21)

CONCLUSIONS

Ancylostomiasis is an important cause of gastrointestinal bleeding that has been forgotten. One fifth of these patients have iron deficiency anemia, but only 2% have severe clinical pictures. The diagnosis is made by viewing the parasite either through microscopic analysis of stool samples or through endoscopy. Treatment uses anthelmintics which are highly effective for deworming.

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Conflicts of Interest

The authors have no conflicts of interest.

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