



ORIGINAL RESEARCH PAPER

Microbiology

CASE REPORT: HOOKWORM INFECTION AS A CAUSE OF MELENA AND SEVERE ANEMIA

KEY WORDS: Severe anemia, Melena, Hookworm disease, neglected parasitic disease.

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ABSTRACT In this study, a patient who was hospitalized with a severe anemia in the Medicine Ward of the Tertiary care center for one week is presented. The patient had generalized weakness, fatigue, paleness and giddiness for one month. Also patient complaint of blood in stool (Melena) since one year. Severe iron deficiency anemia was diagnosed in the patient by laboratory analyses. Patient did not improve despite being transfused with 2 units of packed RBC. Because there were no hematologic factors associated with severe anemia, the stool examination was also performed. Stool microscopy of the patient revealed numerous ova of hookworm. General condition of the patient well improved with anti-parasitic and anti-anemia treatment. It was concluded that patients with iron deficiency anemia diagnosed in health centers should be also examined for the neglected parasitic diseases encountered rarely, and physicians should consider non-endemic but neglected parasitic diseases in their provinces

Introduction:-Hookworm infection is a common public health problem caused by a parasitic nematode that lives in the small intestine of most mammals as its hosts, such as dogs, cats and humans. It is included in the group of Neglected Tropical Diseases (NTD). Approximately one billion people are affected in the underdeveloped countries of the tropics and subtropics. 1 Highest prevalence occurs in sub-Saharan Africa and eastern Asia. Two voracious blood-thirsty nematode species namely *Ancylostoma duodenale* (A.duodenale) and *Necator americanus* (N.americanus) are responsible for human infection. 2 Worldwide *N.americanus* is the predominant etiology of human infection, whereas *Ancylostoma duodenale* occurs in more scattered focal environments. Infected individuals present with abdominal pain, generalized weakness, and fatigue and iron-deficiency anemia. Anemia is the most serious consequence, secondary to loss of iron and protein of the gut. It has been estimated that *A.duodenale* ingests about 150 µL blood per day while *N.americanus* sucks about 30 µL.³ However, this blood loss cannot be visualized by naked eyes. Whereas most of the individuals are asymptomatic, individuals with heavy worm burden, prolonged duration of infection and an inadequate iron intake may manifest with severe iron deficiency anemia. The diagnosis is based on the identification of characteristic non-bile stained eggs on stool microscopy and eosinophilia on blood examination. 4 Here we report a case of Melena and severe iron deficiency anemia owing to chronic hookworm infection.

Case Report

We hereby report the case of a 18 year young boy, resident of Barshi admitted to the Medicine ward with chief complaints of generalized weakness since 1 month, and blood in stool (melena) since 1 year. He also had difficulty in breathing on walking associated with easy fatigability. On general physical examination, the patient was afebrile, tachycardia and facial puffiness. Pallor was observed on all sites. Complete blood count revealed hemoglobin 2.5g/dl and Total leucocyte Count 6500/L. Peripheral blood film showed microcytic hypochromic anemia with no malarial parasite. MCH, MCV and MCHC all values decreased. Blood and urine cultures were sent for and on examination were found to be sterile. Sputum sample was also sent for acid fast bacilli which came negative. Chest X-Ray was done which showed normal findings. Patient was transfused with 2 packs of B-Rh Negative packed red blood cell. A detailed history was again sought from the patient had a similar history two years back and also had two episodes of Blood transfusion for the same .The

patient had a passage of blackish stools since 1 year. Grossly, Stool sample was found to be greenish black in color, solid in consistency and foul smelling without any segments or adult worm. Stool for occult blood was positive. On microscopic examination, numerous oval, colorless (non-bile stained) eggs containing segmented ovum with 4 blastomeres and a thin shell membrane were seen, thus confirming the diagnosis of hookworm infestation (Figure 1). Stool microscopy revealed eggs of hookworm with few pus cells & RBCs. As a result of the high load the patient was transfused with 2 units of blood to compensate for severe anemia. Treatment was initiated with albendazole 400 mg/12 hours for two consecutive days together with oral iron supplements (ferric sulfate) for two months. Two months later all hematological parameters were improving along with a negative examination of fecal parasite.

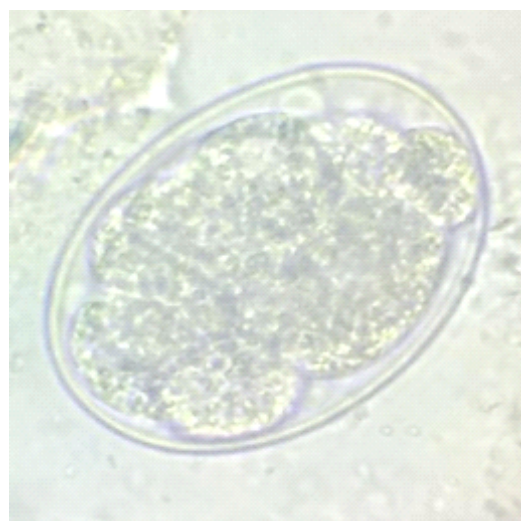


Figure 1 showing eggs of hookworm

Results and Discussion

Hookworm infection is a public health issue in our country. The main risk factors associated with this infection are: living in rural, tropical and subtropical areas, social and economic factors, and poor hygiene, impaired management of biological waste and walking barefoot which enables the penetration of the parasite into the skin. Hookworms live in the small intestine, their eggs are

eliminated through human stool and in the appropriate conditions they hatch in the soil to release larvae that mature into ineffective filariform larvae. Infection is acquired by penetration of the 3rd stage larvae (L3) through the skin. L3 migrates through the body into the blood vessels and are carried to the lungs and ultimately to the pharynx, whereby they are swallowed and thereby complete their life cycle in the intestine. 5,6 Lesions mostly depend on the number of larvae producing the infection, number of migratory larvae and the number of adult parasites developed. Infection is considered severe when there are over 500 parasites. The adult hookworm resides in the small intestine sucking 0.01-0.03 ml blood/day, depending upon the species infecting. Manifestation may range from clinically asymptomatic to chronic blood loss and chronic iron deficiency anemia, depending upon the body iron store, worm burden and duration of infection 7,8 Acute phase is characterized by itching at site of larval penetration, pneumonitis, retrosternal pain, abdominal pain and diarrhea. On the contrary chronic infection is asymptomatic or manifested by symptoms and signs resulting from anemia, which mainly occurs as a result of duodenal ulcers due to infection and the worms feeding on the hemoglobin. This result in iron-deficiency anemia being one of the most frequently found manifestations of the disease in its chronic phase; just as in our patient.7 Hookworm infestations are notorious for causing severe iron-deficiency anemia. Attachment of the worms to the GI mucosa via cutting apparatus and the concomitant release of anticoagulant factors causes chronic blood loss.8 This eventually results in an insidious anemia, with no frank blood loss appreciable.⁹

The diagnosis is usually made by the characteristic clinical history, blood investigations such as microcytic hypochromic anemia along with eosinophilia and presence of characteristic egg on fecal examination, Degree of anemia caused varies with species, parasitic load and patient age, 10 and resolves soon after initiation of anti-parasitic treatment and iron supplementation, with transfusions occasionally being required in severely anemic cases. While anemia is commonly seen in cases of worm infestations, evidence of overt hemorrhage like melena remains a rare sign of infection.⁹

Health education is also of great importance in areas of endemic infection.11 Our patient did not wear closed shoes and practiced poor hand hygiene during daily activities. Such lack of awareness is common especially in rural and low socioeconomic settings and puts a significant proportion of young population at risk for hookworm-related anemia. Thus it becomes important to keep hookworm infection as a provisional diagnosis for chronic persistent severe anemia as one of the neglected parasitic disease in a rural setting.

Conclusion: - Thus in a tropical country like India, soil transmitted helminthic infection should always be considered as a differential diagnosis in patients with non-responding iron-deficiency anemia, especially in patients coming from rural areas. Also to prevent intestinal parasitic infections, patients should be educated and awareness is created among the patient and their family regarding maintenance of personal hygiene, sanitation and environmental hygiene.

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