

**Case Report**
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## Atypical Case of Hookworm Infestation in Chronic Anaemic Patient in a Tertiary Care Centre

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**ABSTRACT**

The hookworm infection is the leading neglected tropical disease among the 20 diseases listed by WHO. *Ancylostoma duodenale* and *Necator americanus* are two principal species of hookworm known to infect humans. *A. duodenale* is a soil transmitted helminth which enters through skin penetration in humans. Its infection leads to iron deficiency anemia (IDA), tiredness, etc. Case presented with chief complaint of breathlessness and anaemia. Investigations were done where on endoscopy few worm like structure was found in duodenum which on microscopy was confirmed as *Ancylostoma duodenale*. Follow-up and complete treatment was done. Hookworm infection is still an important issue for community health. Education programs on health and early intervention can help to tackle future complications.

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**Introduction**

*Ancylostoma duodenale*, the human hookworm, is the most common parasitic infection in countries with poor access to adequate water, sanitation and hygiene especially in tropical areas. It is a parasitic nematode worm and commonly known as the Old World hookworm. It is estimated that more than 1.5 billion people worldwide are at risk for infection with *Ancylostoma* and other (Soil Transmitted Helminth) STH. Mostly its cases are reported from Asia and the Pacific where tropical climate, over-crowded population, poor hygiene, and poor sanitation are present. *A. duodenale* along with other soil-transmitted helminths (STH) are transmitted via penetration through skin. It manifests as intestinal infections with gastrointestinal (GI) symptoms, anemia, and physical and cognitive impairment. The highest at-risk population to contract *Ancylostoma* infections are the pre-school and school-aged children and travelers who returned from tropical countries. Additionally, people in close contact with dogs and cats are at risk to acquire zoonotic *Ancylostoma* infection. The incidence of *Ancylostoma* infection is tied to seasonal distribution where during the summer-autumn period, the incidence is more prevalent. This hookworm is well known in mines because of the consistency in temperature and humidity that provides an ideal habitat for egg and juvenile development. Single dose of albendazole and pyrantel pamoate is recommended for treatment. [1-3]. Although in few cases duration of treatment is continued for 2-3 weeks after which blood work up is done. Hookworm infection gives rise to iron deficiency anemia (IDA), weight loss, tiredness. The erosion due to the biochemical action of the secretion of a hydrolytic enzyme, anticoagulants, and teeth characteristic of each species caused

hemorrhages that follow blood loss in anemia [4,5].

**Case History**

A 67 year old male presented with chief complaints of breathlessness and generalised weakness since 10 days in Medicine OPD in King George Medical University (KGMU) before which he was asymptomatic. There is no history of smoking and tobacco chewing and no significant family and past treatment history. On general examination, pallor was present. Other systemic and general examination was within normal limits. Routine microbiological investigations were performed in which haemoglobin was 8.3g/dl, total leucocytes count was 14,300 cells/cumm, neutrophils 63%, lymphocytes 20%, monocytes 04%, eosinophils 13% and platelet count 4,50,000/cumm. Bone marrow smears are particulate and hypercellular for age, Microcytic Hypochromic anemia was ascertained. Bone marrow biopsy showed Megaloblastic Erythroid Hyperplasia. Patient diagnosed as a case of chronic anemia. Abdominal CT scan suggests that the wall of the gastric antrum is slightly thicker presented as irregular uniformity in wall. Upper GI Endoscopy shows multiple duodenal hookworms present in D1 and D2. Endoscopy aspirate was sent to Microbiology lab of KGMU for microscopy. On suspicion of duodenal hookworm infection, wet mount of the aspirate was prepared.

A large and thick adult worm with its anterior end bending in same direction as the body curvature is seen, diagnosed to be male form of *Ancylostoma duodenale*. On stool microscopy no eggs were detected. The patient was put on anti-parasitic drugs with 3-day dose of albendazole single daily and single dose of pyrantel pamoate for *Ancylostoma* infection. Iron replacement and nutritional support was included in the management of infection to reduce the morbidity rates. After 2 to 3 weeks of treatment, stool

examination and blood workup was done to evaluate treatment efficacy and to exclude the presence of any reinfection. After removing the parasites for 1 week, the patient's haemoglobin improved HBG 12.3g/L, further on 3 months proper treatment there were no parasites in the stomach only superficial gastritis present (Figure 1).

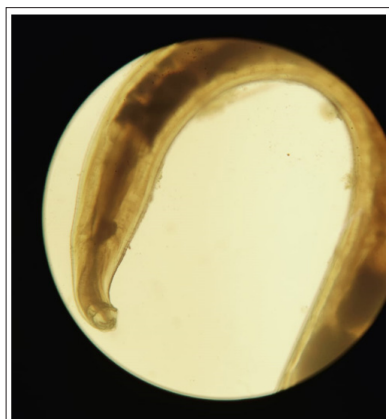


Figure 1

### Discussion

The prevalence of hookworm infection is highest in sub-Saharan Africa, followed by Asia, Latin America, and the Caribbean. It is estimated that over 800 million people are infected with hookworms worldwide. Poor sanitation, scarcity of potable drinking water, and the low standard of personal hygiene contribute the share in the rapid spread of the infection [6-8]. After many years of using antihelmintic MDA (Mass Drug Administration) to treat and control *Ancylostoma* and other STH infections, the transmission of these worms is still ongoing. Hence, drug resistance exists. Healthcare practitioners should take a careful history, including whether patients walk barefoot in endemic areas, any contact with domesticated animals, and should also enquire about the nutritional status and growth of patients to determine the presence of these parasitic infections. Once the diagnosis is made, the treatment with drugs like albendazole and mebendazole is highly effective. Long term consequences are both iron deficiency anemia and protein malnutrition, with subsequent growth stunting and decreased cognitive capacity, especially working memory. Vaccines that could provide long-term protection and the ability to stop disease transmission should be developed and target against several antigens of *Ancylostoma* species [9]. The availability of the vaccine will be a huge benefit for public health in combating these infections. The prognosis for *Ancylostoma* infections is very good with proper treatment. Mortality is low, but morbidity can be significant, especially when reinfection occurs [10].

### Declaration of Patient Consent

The author certifies that they have obtained all appropriate patient consent forms. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

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Nil

### Conflicts of Interest

There are no conflicts of interest

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