

RESEARCH ARTICLE

ANCYLOSTOMA DUODENALE PRESENTED AS SEVERE ANAEMIA: A CASE REPORT IN A TERTIARY CARE CENTRE, NORTH-EAST INDIA

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Manuscript Info

Abstract

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Hookworm infections (Necator americanus, Ancylostoma duodenale) are common in rural areas of tropical and subtropical countries. Human get infection from direct percutaneous invasion of infective larva from contaminated soil. The majority of infected patients remain asymptomatic. However, iron deficiency anaemia (IDA) due to chronic blood loss is the major complication. Here we presented a case of iron deficiency anaemia with its relavent history which later on diagnosed as a chronic case of hookworm infection with Ancylostoma duodenale.

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Introduction:-

Hookworm infection is an intestinal helminthiasis caused by two different species of hookworm Ancylostoma duodenale and Necator americanus. Recently infection by Ancylostoma ceylanicum is also included. These hookworm infections are considered as Neglected Tropical diseases (NTDs).^[1]

The prevalence and severity of hookworm infection vary widely in different parts of world because of climatic, socio-economic, educational and environmental factors and sanitary condition as well.^[2] Globally, more than 1.5 billion people are infected with soil-transmitted helminths(STH), among them approximately 576 -740 millions are hookworm infection. They are widely distributed in tropical and subtropical areas, more commonly in sub-Saharan Africa, America, China and East Asia.Common in children and pregnant women.^[3,4]

In India, despite substantial progress in reduction of morbidity due to hookworm infection, reinfection rates remain high in endemic communities. More than 200 million people are estimated to be infected with hookworm. A. duodenale infection is predominant in North India.^[5] In north-east, hookworm infection is common among rural tribals of Meghalaya and Necator americana is the common species.^[2]

Iron-deficiency anaemia is the most common type of anaemia world wide.Occurs with decreased level of haemoglobin in red blood cells (RBCs). It has been estimated that more than one third of the world's women are anaemic, majority of this burden occurring in developing countries ^[6].This produces an enormous public health impact with significant mortality and morbidity risk. Many patient with iron-deficiency anaemia (IDA) remain asymptomatic for years.IDA occur due to many causes like due to excessive blood loss, increased needs like (adolescence, menstruation, pregnancy, lactation, etc), insufficient intake (eg, limited diet, malnutrition) and

Corresponding Author:- Dr. Ashmita Banik Address:- Post Graduate Trainee, Department of Microbiology, AGMC & GBP Hospital, Agartala, Tripura. decreased absorption (high gastric pH, gastric/bariatric surgery etc). Hook worm infection is one of the cause of chronic blood loss leading to iron deficiency anaemia.

We hereby reported a case of 81 year old farmer from a remote village of Tripura, North East India, admitted with clinical manifestations of chronic anaemia, later on excluding all other etiologies, diagnosed as a case of infection with Ancylostoma duodenale.

Case:-

A 81 year old male farmer from a remote village of Tripura who was suffering from generalised weakness, fatigue, tiredness, loss of stamina and shortness of breadth at moderate effort since last 3-4 months, suddenly experienced an episode of haematemesis followed by a syncopal attack with which he was admitted to the Intensive Care Unit (ICU) of Agartala Government Medical College. He was also having constipation and did not pass stool for one week.On general physical examination, patient was semiconscious, with Glasgow Coma Score (GCS) 12/15, afebrile, pale, blood pressure (BP) 100/60 mm of Hg, pulse rate 100 beats per minutes (bpm).On systemic examination, abdomen is soft, depressible without visceromegaly. He was started on IV fluid, IV antibiotic and proton pump inhibitor (PPI). He was advised routine blood examination with one upper GI endoscopy.Laboratory investigation report was suggestive of iron deficiency anaemia with eosinophilia.The upper GI endoscopy showed multiple tiny haemorrhagic spot on duodenal muccosa.

Tests	Results	Normal Range
Haemoglobin (Hb%)	6 gm/dl	13.5-17.5 gm/dl
Red Blood Cell (RBC) count	3 million cells/mcL	4.7-6.1 million cells/mcL
White Blood Cell (WBC) count	5,500 cells/mcL	4,500-11,000 cells/mcL
Differential Leucocyte Count (DLC)		
• Neutrophil (N)	33%	55-70%
• Lymphocyte (L)	56%	20-40%
Eosinophil (E)	10%	0-1%
Basophil (B)	0	0-1%
Monocytes (M)	1%	2-8%
Urea	22mg/dl	8-23 mg/dl
Creatinine	0.8	0.7-1.3 mg/dl
Platelet count	1.17 lacs/mm^3	$1.5-4.5 \text{ lacs/mm}^3$
Reticulocyte count	0.6%	0.5-1.5%
Mean Corpuscular Haemoglobin (MCH)	22 pg	27.5-33.2 pg
Mean Corpuscular Volume (MCV)	70 fl	80-100 fl
Mean Corpuscular Haemoglobin	30 gm/dl	33.4-35.5 gm/dl
Concentration (MCHC)		
Peripheral blood smear (PBS)	Microcytic hypochromic anaemia	

Table:- Blood examination report showing iron deficiency anaemia (IDA).

Other etiological factors and differential diagnosis were excluded. Stool sample was sent for routine examination. On gross examination it was semiformed, yellowish brown coloured foul smelling. Stool was concentrated by formol ether sedimentation technique.



Fig 1:- Formol ether sedimentation method.



Fig 2:- Eggs with many blastomeres under high power objectives in saline mount.

Microscopic examination was done following both saline mount and iodine mount preparation. Non bile stained eggs were seen with many blastomeres in many fields and rhabditiform larva were seen in few fields. Under high power (40X), eggs were oval shaped, colourless on saline mount. Eggs consist of thin hyalinised egg shell containing multiple blastomeres with a clear space between the egg shell and the embryo. The structure is identical with a hookworm egg.^[7]

Rhabditiform larva was observed on other field containing intestine, double bulb esophagus with larger buccal cavity and one genital pore. Features were identical with a hookworm larva. In mature form of larva, the anterior end bent in the same direction of general curvature of body suggestive of larva of Ancylostoma duodenale.^[7]

Along with other supportive treatment, for IDA he received one unit of blood and six Iron Dextran Injection one per week. For hookworm infection, he was treated with tab Albendazole 400mg once daily for three days, Tab Mebendazole 500 mg once daily for 5 days. The patient evolved favourably and two weeks thereafter the parasitological examination in faeces was negative.

Discussion:-

In present study infected individual is of 81 year old. Hookworm is unique among helminths in that infection intensities tend to peak in adulthood.^[8]

A study conducted in Hainan Province, China, examined risk factors associated with N. americanus in people 50 years of age and older, and found that age still accounted for 27% of the variation in the intensity of hookworm infection^[9]. This is likely due to the fact that neither age nor exposure-related immunity develops in the majority of hookworm-infected people^[10]. This facts coincide with our study.

Iron deficiency exists in a continuum, from a reduction in body storage iron, to iron deficient erythropoiesis, and ultimately to iron deficient anaemia ^[11]. Because of this patients remain asymptomatic for years.

Hookworms reside in the small intestine of infected individuals attaching to the intestinal villi and feed on host blood. Among individuals with inadequate iron intake and high physiological demands, this blood loss can result in anaemia.^[12]

Hookworms ingest blood and move from site to site in the gut mucosa, leaving behind small bleeding lesions.^[13] This usually observed as tiny haemorrhagic spot in GI endoscopy as in our study.

Ancylostoma duodenale attach to the intestinal mucosa with the help of its six teeth which causes trauma to the intestinal mucosa, moreover it releases enzyme coagulase, which causes ongoing blood loss.^[14] Chronic blood loss ultimately ends with microcytic hypochromic anaemia as in our study.

The development of hookworm-related iron deficiency anemia depends on the level of an individual's iron stores, the intensity of infection, and the infecting species as A. duodenale causes a greater blood loss than N. americanus. A study in Tanzania among school-age children concluded that A. duodenale is associated with a greater burden of iron deficiency ^[15]

Conclusion:-

Chronic iron deficiency anaemia cases with unknown etiology from endemic areas of hookworm infection commomly from tropics & subtropics must be processed for diagnosis of hookworm diseases. So in this areas, in examination profile of chronic iron deficiency anaemia, investigations for hookworm may be included.

A few reported case of haematemesis following hookworm infestation is observed in various part of world.^[16] It can be concluded out of varied symptoms of haematemasis proper monitoring for hookworm infection with history and examination must be within the perview of the microbiological examination for chronic anaemia cases so that intermingling with bleeding from general peptic ulcer diseases can be avoided.

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