INTESTINAL HELMINTHIASIS IN BANGLADESH, THE CLINICAL FEATURES

S. Ahmed*

Introduction

Intestinal helminthiasis is one of the commonest gastrointestinal diseases in East Pakistan. Patients of different age groups and strata with various manifestations of gastrointestinal, cardiovascular, respiratory and other systems due to helminthic infections seek medical advice either in private clinics or in hospitals everyday. Not uncommonly patients are admitted in hospitals with serious complications such as acute intestinal obstruction, performation with peritionitis, severe anaemia with heart failure, gross malnutrition, toxaemia and convulsions. The climate, porous and moist soil of Bangladesh are very suitable for growth of larvae of soil transmitted helminths e.g. Ascaris lumbricoides, hookworm etc.

Vast majority of our population are illiterate and engaged in farming, marketing and allied occupations. They live in rural areas of unhygienic surroundings. There is no proper arrangement for disposal of night soil in villages and they make generous use of the river and pond waters contiminated with human excreta. As in most villeges and slum areas of unplanned growing towns, the people are crowded into limited living space, thus encouraging spread and propagation of helminthic diseases. Unhygienic social conditions, apathy in the achievements of positive health, ignorance, prejudices and poor economic status, all added to the propagation of helminthic infections. Unfortunately the helminthic infections are at times considered by the common mass as something unavoidable and nothing unusual.

No comprehensive survey has yet been done to find out the incidence of different helminthic infections in our country. The reports published so far in different journals are not suffcient to give an over all idea about the true picture of helminthic infections in Bangladesh. The survey report of Kuntz (1960) who investigated the incidence of intestinal parasites in school children in the vicinity of Dhaka city revealed a picture of helminthic infections in a very small selected age group only. Muazzam et al (1961) reported on their findings in Dhaka and Rajshahi about intestinal parasites among selected cases with gastrointestinal symptoms referred by clinitians and from hospital wards. The figures of Kuntz were 60% ascariasis and 47% hookworms in 300 school children. Muazzam showed incidence of 33.9% ascariasis and 28.2% hookworm cases in 2421 stools examined. According to Chowdhury (1965) stools examination of his cases revealed helminthic infestations with Ascaris in 52%, hookworm in 6% and T. Trichiura in 20% of his cases. From these reports and from clinical observations it appears that ascariasis,

* Dr. Shamsuddin Ahmed, MBBS, FCPS (Medicine) Institute of post-Graduate Medicine, Dhaka.

hookworm diseases, trichuriasis are quite common. The taeniasis, Hymenolopes nana infestation, fasciolopsiasis and strongyloidiasis are uncommon in East Pakistan. Though enterobiasis is quite common here, incidence shown in their series was very low. It might be due to the fact that stool examination is not the suitable method for diagnosing threadworm infection. If scotch cellulose tape method is used, the incidence will definitely be much higher.

To avoid complications and to eradicate the worms from the infected persons and to prevent spread of the diseases, early diagnosis is necessary. Only stool examination can help diagnosis of most of the cases and it is the simplest and easiest method that can be carried out every where either in hospital or in private clinics. It is interesting to record here the observations by Islam et al (1962). Of the 162 cases who were suspected to be suffering from peptic ulcer, 25.9% had A. lumbricoides with organic lesion and 28.3% cases had ascariasis without organic lesion of stomach and duodenum. These authors stated that ascariasis and peptic ulcer were often difficult to distinguish on clinical grounds and that stool examinations were not always reliable in the ditection of the presence of infection with Ascaris lumbricoides. They concluded that in a good proportion of cases ascariasis could be detected by X-ray examination 2-3 hours after a barium swallow. Unfortunately some of the petients do not usually seek advice until and unless some complication arises.

Treatment of uncomplicated helminthic infestations is purely medical and the patients can be treated without hospitalization, only few complicated cases of ascariasis need surgical management. The importance of timely diagnosis and adequate treatment of helminthiasis can not therefore be ignored.

The purpose of this article is to bring home our present day knowledge about the clinical features of helminthiasis.

Morbidity and mortality

Ascaris lumbricoides :

The adult worms may cause a chronic intestinal catarrh. Their migration may lead to intestinal perforation and peritonitis, especially in cases associated with typhoid or other ulcerations, to appendicular obstruction, blockage of the bile duct leading to jaundice, pancreatic duct obstruction giving rise to inflammatory changes in the pancreas. Intestinal obstruction may be produced by impection with a large bunch of worm, or by intussusception due to the worm. Occasionaly, the worm may pass up the oesophagus and pharynx, and then go down the larynx causing respiratory obatruction. In women, they may invade the generative tract, and have been found encysted in the Fallopain Tubes. Other complications such as hepatic abscess, middle ear obstruction, lacrymal duct obstruction, fatal pulmonary infection- all are reported and published in various journals. It has also been emphasized that the presence of ascarisis lumbricoides constitute a potential hazard to otherwise routine surgical proceedings.

Very interesting post mortem findings were described by Muazzam, Khaleque and Ibrahim (1960). They described the condition as hepatic ascariasis. Large number of adult Ascaris were found in bile duct, hepatic duct and also one in gall bladder.

There were a large abscess in the liver and two other granulomatous areas with coiled up round worms.

The mortality from uncomplicated Ascaris infection is almost nil. But complications may be caused by migrating worms and even death may occur.

Hookworms :

The hookworms produce their harmful effect on the system chiefly by loss of blood caused by them, though some authers believe that they may secrete some toxins. To produce any harmful effect in the host, the parasites must be in sufficient number. The number of worms may very from 10-25 in very light infection to several thousands in very heavy infection. But it must be admitted that the severity of symptoms is not always proportionate to the number of worms. It should be remembered that a light infection in co-existence with malaria, kala-azar or dysentery may produce a serious disterbance to the health (Manson- Bahr. 1966).

The characteristic pathological lesions, which the worms produce, are ecchymoses and small erosions in the intestinal mucosa, in the centres of which they are seen attached. There are usually more erosions in the mucosa than the number of worm, indicating that they shift from one point to another. The body of the host becomes anaemic and often oedematous. Heart may be dilated and may show evidences of fatty degeneration and failure. Liver and kidneys also show fatty change. The anaemia is generally hypochromic microcytic but macrocytic anaemia may occur in certain percentage of cases. Coagulation time is prolonged. Eosinophil cells increased.

The bone marrow in hookworm infection associated with iron defeciency anaemia show moderate erythroblastic hyperplasia, with an erythrocyte myelocyte ratio in the vicinity of one.

Besides an increase in eosinophils, there is no other abnormality in the granulocyte series. The number of magakaryocytes is either normal or slightly increased. Iron-stained haemosiderin is absent. Megaloblastic proliferation is occassionally observed and hypoplastic marrow is a rare event.

The prognosis is good if the desease is detected early and properly treated. Children may suffer from mental and physical retardation. Due to larval invasion there is dermatitis, vesiculation and pastulation may ensue and even extensive ulceration may occur.

It is found that hookworm disease exerts a deleterious influence on pregnancy, and that in heavily infected districts it is the most common cause of repeated abortions and miscarriage. Moreover, a heavy maternal and fatal mortality is associated with it, and early interruptions of pregnancy and neonatal deaths are also included among its effects.

Women who are haevily infected show a predispositions to taxaemias, such as preeclampsia and nephritis. The average mortality is low, but death may occur from syncope, diarrhoea or asthenia or some intercurrent affections. (Manson-Bahr. 1966).

Enterobius vermicularis :

The significant pathology is the irritation caused by the gravid females around the anus. The migrating females may enter into the female genital tract and female urethra producing, inflammation. These worms even enter into perltoneal cavity through Fallopain tubes. Salpingitis and appendicitis may occur. Pelvic granuloma caused by Enterbius vermicularis are reported in world literature through the cases are very limited. All recorded cases of pelvic granuloma occured in females. (Brooks et al. 1962 and WHO report, 1964).

Trichuris trichiuria :

This worm produce no remarkable pathology but in heavy infection chronic diarrhoea and even rectal prolapse may occur in children (Jung & Beaver, 1952).

Strongyloides stercoralis :

A few isolated cases of heavy auto- infection resulting in severe disease and even death are reported fron endemic areas of the world. In mild cases there is catarrhal enteritis with mucus secretion and sometimes haemorrhage and microulceration. In intermediate forms there may be oedematous enteritis with atrophy of the mucosa and oedema of the submucosa. Serious forms are characterised by ulcerous enteritis. The most pronounced lesions occur in the skin, either as a result of local penetration or sensitivity reactions, "Creeping eruption" occur in case of strongyloides infection due to migration of larvae in the sub-epithelial skin layers.

Tape worms :

The adult worms while living in the intestine usually do not give rise to any definite pathology. Hymenolopes nana in heavy infection are stated at times to cause severe toxaemia, diarrhoea, epileptiform convulsions in children in whom they are usually found. If man swallows eggs, liberated from disintegrating gravid segments of T. Solium of his own or another person, he develops cysticercosis. The cysticerci in man are lodged in the connective tissues, voluntary muscles, and the central nervous system. Cysticercus in brain is surrounded by neuroglia, lymphocytes and few plasma cells. When dead and degenerated it acts as irritant and focal necrosis around the cyst may occur and later becomes calcified. They rarely develop in the spinal cord.

Fasciolopsis buski:

The parasites live in, and affect, the intestine particularly the doudenum. Foci of inflammation form at the site of attachment, which sometimes proceed to haemorrhage or abscess formation. In heavy infections oedema of face, abdominal wall and lower extremities may occur. The condition sometimes progress to prostation and death. In children disturbances of growth and development are observed.

Methods of Study :

Fifty cases of different age groups, sexes and occupations presenting with manifestations of intestinal helminthiasis were studied. The patients suffering from some other organic diseases of gartro-intestinal tract with incidental helminthic

infestation were not included in this sirles as the aim of studies was based on clinical aspects of helminthiasis.

The criteria for diagnosis were clinical history of the patient, physical findings, stool examination, blood examination, sputum examination, X-ray chest and barium meal X- ray of Gestro- intestinal tracts and identification of adult worms after anthelmintics.

The following particulars were noted in each case:-

1. Age
2. Sex
3. Occupation.
4. Duration of illness
5. Presenting symptoms
6. Physical sings
7. Demonstration of ova,larvae or adult worm in stools.
8. Percentage of haemoglobin.
9. Type of anaemia
10. Total WBC count & percentage of eosinophils.
11. Results of treatment.

Incidence of different types of helminths in this series of fifty cases is given below in Table-1.

Table 2 shows the incidence in combination of different helminths.

Table-1

Types of helminths	Number of patients	Percentage
Ascaris lumbricoides (only)	15	30%
Ascaris + E. vermicularis	3	6%
Ascaris + Hookworms	5	10%
Ascaris + T. Trichiura	6	12%
Ascaris + Hookworms + T. trichiura	4	8%
Hokworms (only)	7	14%
Hookworms + T. trichiura	3	6%
E. vermicularis (ony)	4	8%
Strongyloides stroralis	1	2%
Teenia	1	2%
Fasciolopsis buski	1	2%
Total	50	

Incidence of Ascaris, Hookworms, T. trichiura and E. vermicularis taken separately.

Table-2

Types of helminths	Number of cases	Percentage
Ascaris lumbricoides	33	66%
Hookworms	19	38%
T. trichiura	13	26%
E. vermicularis	7	14%

Age incidence :

The age incidence of patients, in this series, with manifestations of intestinal helminthic infections varies from one to seventy years (Table-3). The number of cases include the multiple helminthic infectioins.

Table-3

Age in Yeaes.	Ascaris lubmricoides	Hook-worms.	Trichuris tricuhiura.	E. Vermi culrais	Strong. stercoralis.	Taenia	F. Buski.
1-5	13	Nil	2	1	Nil	Nil	Nil
6-10	9	1	3	1	"	"	1
11-15	5	1	1	Nil	"	"	Nil
16-20	2	2	1	1	"	"	"
21-25	1	3	2	1	"	"	"
25-30	1	3	1	Nil	1	"	"
31-35	Nil	3	1	1	Nil	1	"
36-40	1	2	1	Nil	"	Nil	"
41-45	Nil	2	1	"	"	"	"
46-50	1	1	Nil	1	"	"	"
51-55	Nil	Nil	"	Nil	"	"	"
56-60	"	"	"	"	"	"	"
61-65	"	1	"	"	"	"	"
66-70	"	Nil	"	1	"	"	"
Toral :	33	19	13	7	1	1	1

Out of 50 cases 31 belong to the age group 1 to 10 years.

Sex incidence :

Sex incidence in different helminthic (intestinal) infections shown below (each type of helminths taken separately).

Table-4

Types of helminths	Male patient	Percentage (approx)	Female Patient	Percentage (approx)
Ascaris lumbricoides	17	51.52%	16	48.48%
Hookworms	16	84.21%	3	15.79%
Trichuris trichiura	7	53.85%	6	46.15%
E. vermicularis	4	57.14%	3	42.86%
Stromb. stercoralis	1	100%	Nil	-
Taenia	Nil	-	1	100%
F. buski	1	100%	Nil	-

Occupational incidence :

Table 5 shows the occupational incidence :

Table-5

Occupation	Number of Patients	Percentage
Farmers	25	50%
Labourers	9	18%
Students	5	10%
Businessman	3	6%
Miscelleneous	8	16%
Total :	50	100%

Duration of illness :

Table 6 shows the dnration of illness

Table-6

Duration of Illness	Number of cases	Percentage
1-2 Months	3	6%
2-3 "	19	38%
3-4 "	5	10%
4-5 "	3	6%
6-7 "	3	6%
7-8 "	4	8%
8-9 "	2	4%
9-10 "	1	2%
10-11 "	1	2%
11 Mon. 1 Year	1	2%
1 - 2 "	1	2%
2 - 3 "	1	2%
3 - 4 "	1	2%
4 - 5 "	1	2%
5 - 6 "	Nil	-
6 - 7 "	1	2%
7 - 8 "	1	2%
8 - 9 "	1	2%
9 - 10 "	1	2%
Total :	50	100%

Presenting Symptoms:

The presenting symptoms in children differs considerably from that of adults. So these are shown separately.

The presenting symptoms in children:

1. Abdominal pain.
2. Diarrhoea.
3. Dysentery.
4. Flatulence.
5. Nausea.
6. Vomiting.
7. Passage of worm through mouth and nose.
8. Increased salivation.
9. Loss of appetite.
10. Increased appetite.
11. Geophagy.
12. Constipation.
13. Passage of worm or segments with stool.
14. Teeth grinding.

15. Fever.
16. Cough.
17. Pruritus.
18. Urticaria.
19. Picking of the nose.
20. Convulsions.

The symptoms produced in younger children were described by the mothers of the children or attendents.
Presenting symptoms in adults :

1. Abdominal pain or discomfort.
2. Increased salivation.
3. Nausea.
4. Vomiting.
5. Passage of worm with stool or vomit.
6. Loss of appetite.
7. Diarrhoea or constipation or both.
8. Pruritus ani.
9. Low grade fever.
10. Giddiness.
11. Palpitation.
12. Shortness of breath.
13. Lassitude.
14. Syncope.
15. General weakness.
16. Disturbance of sleep.
17. Buzzing in theear.
18. Swelling of legs.

The patients suffering from severe anaemia due to hookworm infection complained mainly of giddiness, palpitation, shortness of breath, lassitude, syncopal attacks and general weakness in addition to gastro- intestinal symptoms (Table-7).

Table-7

Sl. No.	Symptoms	Number of cases	Percentage
1.	Abdominal pain	40	80%
2.	Diarrhoea	13	26%
3.	Nausea	15	30%
4.	Vomiting	10	20%
5.	Increased salivation	5	10%
6.	Loss of appetite	13	26%
7.	Increased appetite	3	6%
8.	Geophagy	4	8%
9.	Passage of worm through mouth or nose	6	12%
10.	Passage of worms with stools	8	16%
11.	Flatulence	5	10%
12.	Teeth grinding	9	18%
13.	Pruritus ani	11	22%
14.	Urticaria	4	8%
15.	Picking of the nose	7	14%
16.	Fever	13	26%
17.	Cough	7	14%
18.	Convulsions	2	4%
19.	Giddiness	5	10%
20.	Palpiration	10	20%
21.	Shortness of breath	2	4%
22.	Lassitude	3	6%
23.	Syncope	1	2%
24.	Swelling of legs	3	6%

Almost all patients had multiple symptoms.

Physical signs :

Physical signs in children :-

1. Poor nutrition.
2. Stunted growth.
3. Pallor and anaemia.
4. Protuberent abdomen with lumber lordosis.
5. Dehydration.
6. Irritability and listlessness.
7. Oedema legs.
8. Fever.
9. Convulsions.
10. Foul breath.

11. Enlarged liver.
12. Feelings of worms per abdomen.
13. Visible peristalsis in abdomen.
14. Crepitations in lungs.

Physical signs in adult mainly produced by hookworm infections with severe anaemia and following signs were found:-

1. Puffy face.
2. Pallor and anaemia.
3. Ankle oedema.
4. Koilonychia.
5. Signs of cardiac dilation and failure.
6. Mental apathy etc.

Incidence of physical signs in 50 cases-both chilfren and adults combined (Table-8) are given below :

Table- 8

Sl. No.	Physical signs	Number of patients	Percentage
1.	Poor nutrition :	21	42%
2.	Stunted growth	13	26%
3.	Pallor and anaemia	38	76%
4.	Puffy face	5	10%
5.	Mental apathy	3	6%
6.	Dehydration	3	6%
7.	Koilonychia	2	4%
8.	Irritability & listlessness	12	24%
9.	Oedema legs	5	10%
10.	Fever	4	8%
11.	Convulsions	2	4%
12.	Foul breath	4	8%
13.	Enlarged liver	6	12%
14.	Protuberent sbdomen	9	18%
15.	Feeling of worm per abdomen	7	14%
16.	Visible peristalsis in abdomen	4	8%
17.	Crepitation in lungs.	7	14%
18.	Signs of cardiac dilatation	4	8%

Almost all patients had multiple signs.

Percentage of haemoglobin and eosinophil cells in peripheral Blood found in 50 cases. (table-9 and10) are given below :

Table-9

Haemoglobin percentage	Number of cases	Percentage of cases
10 - 20	2	4%
21 - 30	1	2%
31 - 40	5	10%
41 - 50	12	24%
51 - 60	25	50%
61 - 70	4	8%
71 - 80	1	2%
81 - 90	Nil	-
91 - 100	Nil	-
Total	50	100%

Table-10

Eosinophil percentage	Number of cases	Percentage of cases
0 - 5	2	4%
6 - 10	29	58%
11 - 15	16	32%
16 - 20	3	6%
Total	50	100%

All the cases showed TWBC count normal except two children with fever and lung findings where TWBC count was above 12,000/cmm.

Discussion :

Intestinal helminthiasis is extremely common in Bangladesh where the climatic condition, habit of the general mass, proverty and ignorance are very much helpful for spread of the disease. Ascariasis is more prevelent among children whereas hookworms in agricultural and other labourers. In so far as the impact of intestinal helminths on nutrition is known, it is clear that the principal effect experienced on a public helath scale are depletion of iron. Consquently there is iron deficiency anaemia due to hookworms and impairment of protein nutrition caused by Ascaris and hookworms. The effects of T. trichiura infection on the incidence of kwashiorkor and other protein malnutrition atated need further investigation. It is well known that kwashiorkor and some other malnutritional conditions may be precipitated by

an attack of diarrhoea or vomiting with anorexia in those whose state of nutrition has been poor or marginal.

Helminthic infection as a whole can be viewed as providing, by their prevelence, an index of a community's progress towards a desirable level of sanitation. It is true that high standard of living depend on high economic productivity and this in turn requires high levels of physical vigor and health. Thus helminths are important to whatever extent they detract from the vigor of the community. The most prevelent and most damaging helminths in East Pakistan are those of the soil-transmitted group specially Ascaris lumbricodes and hookworms.

Treatment of the intestinal helminthiasis has become more simplified due to the discovery of newer less toxic or non toxic drugs. All the cases can safely be treated without much expenditure as only one or two doses of the drugs are necessary in majority of cases. To eradicate the diseases caused by helminthic infections needs much health education, proper disposal of night soils and treatment of infected persons. It is a gigantic problem. From the magnitude of the problems, it is suggested that the country wide survey should be undertaken to determine the incidence and make a scheme for eradication.

Conclusion

The total number of patients in this series is small. Therefore, no firm conclusion can be drawn from this study. One thing is clear that helminthiasis is one of the most common cause of bowel troubles in Bangladesh, particularly due to Ascaris and hookworm infections and important cause of severe anaemia in rural population due to hookworm. The extent to which the population of this country is assailed by intestinal worms is not generally appreciated. Majority of the population harbour these creatures. While some of the worms may appear to have little effect on health, such unbidden guests can not fail to influence the nutritional state of their hosts. So, every physician and surgeon who have to deat with cases of acute or chronic abdominal conditions should keep in their minds the possibility of helminthiasis.

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"Mothers shall suckle their children for two whole years . . ."
—Al Qur'an 2:233

Though Al-Qur'an advocated mothers milk for children upto two years, the modern world for centuries preferred bottle feed. It is however a correct realisation of the modern west that mother's milk is the best. The realisation of Qur'anic truth though late is commendable.