

BRIEF COMMUNICATION

PREVALENCE OF INTESTINAL PARASITES IN METEMA DISTRICT HOSPITAL, NORTHWEST ETHIOPIA

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ABSTRACT

Background: Intestinal parasitic infections (IPI) cause serious public health problem in Ethiopia. They are more prevalent in the poor segments of the population with low household income, poor handling of personal and environmental sanitation, overcrowding and limited access to clean water.

Objective: The aim of this study is to determine the prevalence and distribution of common IPs in Metema District Hospital (MDH).

Methodology: This retrospective study was undertaken in MDH from September 14, 2005 to April 21, 2008. The study subjects were those who gave stool samples for IPs investigation in the laboratory. Stool specimens were examined microscopically for the presence of protozoan, cysts and trophozoites.

Results: Of the total 2592 (44.5%) had one or more intestinal parasitic infections. *E. histolytica*, *G. lamblia*, the Hookworm species, and *A. lumbricoides* were detected as single infection in 1435(24.8%), 694(12.0%), 215(3.7%) and 112(1.9%) of the infected study subjects, respectively. Multiple infection was found in 125 (4.8%) of the total examined. The prevalence of amoebiasis was significantly high in infants less than 1 year and teenagers than other age groups ($P<0.05$). In addition, higher proportions of teenagers were infected by Hookworm, 46 (13.3%).

Conclusion: Intestinal parasitoses, particularly protozoan infections, were highly prevalent in the study area. Periodical deworming (once in 3 to 6 months) in addition to health education on how to practice personal hygiene, food and water sanitation, and the proper use of the latrine should be given to reduce the prevalence of intestinal parasitic infections.

Keywords: intestinal parasite, protozoan, multiple infection.

INTRODUCTION

Intestinal parasitic infections (IPIs) are still among the major health problems of the world. It is estimated that about 3.5 billion people are affected, and that 450 million are ill due to these infections, the majority being children (1). These infections have detrimental effects on the survival (2), appetite, growth, and physical fitness (3), iron deficiency anemia, and physical and mental health problems in children (4).

IPIs are more prevalent throughout the tropics, especially among poor communities. Their distribution is mainly associated with low household income, poor personal and environmental sanitation, and overcrowding, as well as limited access to clean water.

Intestinal parasitic infections which include amoebiasis, ascariasis, hookworm infection, and trichiuriasis are among the ten most common infections (5). The World Health Organization estimates that there are 800 – 1000 million cases of ascariasis, 700- 900 million hookworm, 500 million trichiuriasis, 200 million giardiasis and 500 million amoebiasis (6).

A study conducted in Southwest Ethiopia indicated that most of the urban dwellers had one or more intestinal parasitic infections. *Trichuris trichiura*, *Ascaris lumbricoides*, and *Schistosoma mansoni* were detected in a single infection while *T. Trichiura* with *A. lumbricoides* and hookworms with *S. mansoni* result in double infections (7, 8). The prevalence of these intestinal parasites is significantly associated with altitude difference and is highest in low lands accounting for about 38% (9). In general, the distribution and prevalence of various species of intestinal

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parasite differ from region to region because of several environmental, social, and geographical factors. Studying the prevalence of the various intestinal parasitic infections is essential for developing appropriate strategies for planning and the implementation of controlling and eradicating programs for intestinal parasitoses. So far, the prevalence of intestinal parasites has not been assessed at Metema District Hospital, Northwest Ethiopia. Therefore, this study aims to assess the prevalence of these parasites.

MATERIALS AND METHODS

The study area, Metema Woreda, is a low land in North Gondar Administrative Zone, North- West Ethiopia. It is located in the Ethio-Sudanese boarder, 904 km from the capital city of Ethiopia, Addis Ababa. It has a district hospital, a health center, and 22 health posts.

A retrospective analysis of the profile and distribution of intestinal parasites was carried out from September 14, 2005 to April 21, 2008 at the Department of Parasitology, MDH. The OPD registration documents were reviewed for socio-demographic information such as patient age and sex, and the frequency distribution of parasites. From the document, a total of 5793 patients, who had their stool investigated for intestinal parasite, were selected for analysis. Of these, 21 were excluded because of incomplete information.

Data were entered, cleared and analyzed using the statistical package SPSS, version 13. To ensure the quality of data entered into the computer database, two people independently cross-checked each entry. Frequency tables were prepared to see the distribution of variables and correlate the distribution of parasite within different age and sex. The proportion and p-values were calculated and P-value<0.05 using 95% confidence interval (CI) were considered as statistically significant.

The ethical aspect was considered strictly. The patients' records were kept confidential as their names were not depicted in the final report.

RESULTS

Out of the 5572 patients investigated for intestinal parasitic infection, 2592(44.9%) were found to have single or multiple intestinal parasite infections, while

3180 (55.1%) were free from any parasite. Of the total positive, 1462(56.4%) were males and 1130 (43.6%) were females with a male to female ratio of 1:0.77. About 46% were farmers and the distribution of the study subjects greater than 18 years of age was 1521(58.7%) (Table 1).

Table 1: Frequency distribution by sex, age and occupation of the study subjects for positive parasites (n = 2592), Metema District Hospital, 2005 to 2008

Background characteristics	No. (%)
Sex	
Male	1462 (56.4)
Female	1130 (43.6)
Age group	
< 1	77 (3)
1- 4	417 (16)
5 -14	345 (13.3)
15 – 18	232 (9)
> 18	1521 (58.7)
Occupation	
Student	113 (4.4)
Private business	291 (11.2)
Housewives	244 (9.4)
Government employee	146 (5.6)
Farmers	1195 (46.1)
Dependent*	603 (23.3)

* Elderly, small children

Different types of parasites, including protozoans, nematodes, trematodes and cestodes were detected from the stool samples of the study subjects. The prevalence of *E.histolytica* (cysts and trophozoites) was 1435(24.8%) followed by *G.lambliia* (cysts and trophozoites) 694(12.0%), and *hook worm* 104 (7.1%). *S. stercoralis*, *T. trichiura*, *S. mansoni*, *H. nana* and taenia were the least common reported intestinal parasites among the inhabitants of Metema (Table 2). For both male and female study subjects, the proportion of protozoan infection was higher than helminthes by about 4.6 folds.

As Table 3 shows, amoebiasis was highly prevalent among infants, 43(55.8%), whereas giardiasis was higher in pre-school children, 153(36.7%), (p<0.005). On the other hand, hookworm infections were widespread in schoolchildren, 46(13.3%) and teenagers 24(10.3%). *Ascariasis*, *T. trichiura*, *S. mansoni* infection (6%, 0.9%, and 1.7%), respectively were commonly seen in teenagers.

Among the positive study subjects, the type of parasites was identified as single 2467(95.2%), double 95 (3.6%), and triple 30(1.2%) parasitic infections, re-

spectively. In general, multiple intestinal parasitic infections were seen in 125 (4.8%) of the total study subjects.

Table-2: Prevalence of intestinal parasite among the study subjects (n=2592), Metema District Hospital, 2005 to 2008

Types of parasite	Male (n= 1462)	Female (n=1130)
	No. (%)	No. (%)
Protozoans		
<i>E.histolytica</i> trophozoite	556 (38)	432 (38.2)
<i>E.histolytica</i> cyst	273 (18.7)	174 (15.4)
<i>G.lambli</i> a trophozoite	289 (19.8)	263 (23.3)
<i>G.lambli</i> a cyst	84 (5.7)	58 (5.1)
Helminthes		
Nematodes		
<i>A.lumbricoides</i>	77 (5.3)	35 (3.1)
Hook worm	104 (7.1)	111 (9.8)
<i>S.stercoralis</i>	16 (1.1)	7 (0.6)
<i>T. trichiura</i>	9 (0.6)	3 (0.3)
Trematodes		
<i>S.mansoni</i>	9 (0.6)	12 (1.1)
Cestodes		
<i>H.nana</i>	33 (2.3)	27 (2.4)
<i>Taenia</i> species	12 (0.8)	8 (0.7)

Table-3: Distribution of intestinal parasite among the study subjects positive for parasites (n=2592),

Types of parasite	Age group in years				
	<1(n=77)	1-4(n=417)	5-14(n=345)	15-18(n=232)	>18(n=1521)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Protozoans					
<i>E.histolytica</i> trophozoite	43(55.8)	118(28.3)	116(33.6)	98(42.3)	612(40.2)
<i>E.histolytica</i> cyst	6(7.8)	47(11.3)	58(16.8)	33(14.2)	302(19.8)
<i>G.lambli</i> a trophozoite	21(27.3)	153(36.7)	67(19.4)	39(15.5)	271(14.3)
<i>G.lambli</i> a cyst	5(6.4)	41(9.8)	22(6.4)	11(4.7)	65(4.3)
Helminthes					
<i>A.lumbricoides</i>	0(0.0)	10(2.4)	10(2.9)	14(6.0)	77(5.1)
Hook worm	1(1.3)	17(4.1)	46(13.3)	24(10.4)	129(8.4)
<i>S. stercoralis</i>	0(0.0)	0(0.0)	2(0.6)	1(0.4)	20(1.3)
<i>T. trichiura</i>	0(0.0)	1(0.2)	1(0.3)	2(0.9)	7(0.5)
<i>S.mansoni</i>	0(0.0)	2(0.5)	6(1.7)	4(1.7)	9(0.6)
<i>H.nana</i>	1(1.3)	25(6.0)	14(4.1)	4(1.7)	16(1.1)
<i>Taenia</i> species	0(0.0)	3(0.7)	3(0.9)	2(0.9)	13(0.9)

DISCUSSION

Of the 5793 patients, 2592(44.9%) were infected with one or more intestinal parasites as identified by direct wet mount microscopic examination of stool

samples. The magnitude in our study showed significantly lower infection rate as compared to other community-based studies conducted in Northwest Ethiopia, 67.6% (10), but higher than the studies conducted else where (11,12,13). Such a high prevalence of intestinal parasites is largely due to poor personal hygiene practices and environmental sanitation, lack

of supply of safe water, poverty, ignorance of health-promotion practices, impoverished health services and climatic conditions (hot, wet, and humid air). The prevalence of intestinal infection in the present study is in line with a study conducted at Gondar teaching hospital, 40.5% (14) but lower than that done in South-west Ethiopia, 83% (1).

According to the present study, the prevalence of amoebiasis and giardiasis was 24.8% and 12.0%, respectively. The prevalence rate of giardiasis is in line with the nationwide range (1, 15). It was also similar with Kebede and his colleagues' finding of, 5.8% (16). However, the prevalence of amoebiasis of the current study which showed a slight increase over the range of the nationwide prevalence rate for amoebiasis is higher than the findings of Gondar teaching hospital, 3.8% (17). This may be due to poor personal hygiene, deficient sanitary infrastructure, lack of latrines, or their poor use which are critical problems in Metema.

The infection of *E. histolytica* was higher among the male population while *G. lamblia* affected more females and the association was statistically significant ($p < 0.005$). However, it is difficult to explain why this situation happens; it needs further investigation. Two hundred fifteen (3.7%) of the subjects in this study were infected with Hookworms. The rate was in line with the study conducted at Gondar teaching hospital (17) and in a farming village near Lake Tana (18) which was 3.8% and 3.6%, respectively. However, the current finding was lower than the findings of Leikun 24% (9), and Kebede and his associates 14.9% (16). This may be due to the proper use of footwear and health education on disease transmission. But, hookworm is highly prevalent among advanced age groups, and this might be due to exposure to the risk factors of hookworm. The prevalence rate of *A. lumbricoides* infection in this study was 112 (4.3%) which was in agreement with Kebede and his associates (16). This could be due to the distribution of drugs (example, Zitromaxine) to the population of the study area and a slight improvement in health and latrine coverage (19).

The age-dependent patterns of IPs prevalence generally exhibit a rise in childhood (20). In the present study, amoebiasis and giardiasis were more common among the under 5 than other age groups, with some reduction as age increased. The reason could be better awareness of washing hands and other personal hygiene measures. However, the maximum prevalence of hookworm and schistosome infections usually occurs in adolescence or in early adulthood in

line with Brooker and colleagues (20). The fact that the intensity of hookworm infection increases with increased bare footed contact with infected fecal material, has led to the suggestion that hookworms may either evade or suppress host immune responses (21).

Multiple infection occurred in 125 (4.8 %) of the total subjects examined and was found to be relatively lower than that of studies done elsewhere in Ethiopia (1, 13, 21, 22). Double infection 95 (3.6%) was by far less than that of the study done in Gondar, 30.2% (23); however, the findings of Tadesse (24) and Jemaneh (25) indicated a similar trend for double parasitism. The present study pointed out that 1.2% of the study subjects was exposed to triple parasitic infections in line with study conducted in Langano, 1.1% (26).

CONCLUSION AND RECOMMENDATIONS

Intestinal parasitoses, particularly protozoan infections, were highly prevalent at Metema District Hospital. Among the intestinal parasites, the trophozoites of amoeba (38.1%) and giardia (21.3%) showed higher rates. Therefore, to reduce the prevalence of intestinal parasites, we recommend enhanced supervision and monitoring, improved guidance and health education on environmental sanitation, proper excreta disposal, food and water supply protection, and personal hygiene

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