



Original Article

Intestinal Parasites and Sanitary Practices among the Rural Children

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Abstract

Infestation with intestinal parasites is a common problem throughout the world. It is estimated that at least one quarter of the world's population is clinically infected with intestinal parasites. In this article, we have tried to explore the relation between intestinal parasites and sanitary practices among the rural children in Bangladesh.

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Introduction

Infestation with intestinal parasites is a world wide problem. Current estimate suggest that at least one quarter of the world's population is clinically infested with intestinal parasites and most of the infested people live in developing countries¹.

Most frequent intestinal helminthes in man are *Ascaris lumbricoides*, Hook worm and *Trichuris trichitura* which have a prevalence high rate in Africa, Asia and Latin America.

More than 15,000 people die each day from diseases related to water and sanitation all over the world despite the gains of water decade, 1980-1990². It is estimated that 10% health problems in developing countries are related to diarrhea and helminthes both of which are mostly water born³.

In 1987 it was estimated that 1000 million of world population were infested with *Ascaris lumbricoids*, 900 million were with *Necator americana* and *Ankylostoma duodenale* and 500 million people were *Trichiuris trichiura*⁴.

In Bangladesh, the prevalence of intestinal worm is alarmingly high both in rural and urban areas as the environment fulfills the criteria for transmission of infection from host to host⁵. Low socioeconomic condition, poor sanitary practices, inadequate sanitation facilities, ignorance, poverty, low literacy, congested living and most important is lack of health education are related to wide prevalence of the intestinal parasitic infection of human in developing countries but resources available for their control are very limited.

The consequences of intestinal parasitic infestation constitute a significant health and social problem. These include significant morbidity, reduced physical activity, impaired mental development and unsatisfactory performance of children in school.

Malnutrition is a major problem among Bangladeshi children. At any time about 100 million children suffers from moderate to severe PEM in Asia, Africa and Latin America. Intestinal parasites are extremely common among malnourished population especially young

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children. In 1991 a study was done in Dhaka Shishu Hospital among 100 malnourished children, stool microscopy showed intestinal parasitic infestation among 70% in patient⁷.

Material and Methods

This cross sectional study included 140 children of 6-10 years age group at Kapasia, Gazipur from June-November 2002. The sample was selected by simple random sampling.

An interview schedule with each of the respondents was used as instrument which included one structured questionnaire and one check list for routine stool examination for helminthes.

Those who supplied the stool sample were interviewed face to face and the instrument was questionnaire. To fill up the checklist everything was observed carefully.

Every child was contacted and convinced and was supplied with a plastic container containing 5ml of 10% formalin so that they could supply stool at their convenient time and stools were preserved well. Collection technique and amount of stool to be collected were thoroughly explained to them in groups or individually to their guardians. Stool sample were collected by children or guardians in a center fixed by pathological laboratory of Health Complex. Then collected stool samples were examined by the expert technologists and recorded in the prescribed result sheet.

After filling up the questionnaire, checklist and laboratory report sheet were completed, data entry was done in a computer for analysis using the software program 'Statistical Package for Social Science (SPSS).

Results

Out of 140 respondents 62(44.3%) were parasite positive. According to the type of parasite distribution of the respondents were as: *Ascaris lumbricoids* 15.7%, *Ancylostoma duodenale* 2.1%,

Trichuris trichiura 6.4%, *Giardia lamblia* 16.4% and *Entamoeba histolytica* 3.6%.

Among all respondents 21.4% has facility of sanitary latrine and 96.4% used tube well water for the drinking purpose. Regular shoe wearers were only 31.4% but shoe wearer during toilet use were 81.4%. Wearing shoes in latrine and parasites found statistically significant. Regarding hand washing practice 10.0% and 18.5% respondents were found to wash their hands with soap before meal and after defecation respectively. Relationship between hand washing practice before meal and parasitic infestations statistically significant with *Entamoeba histolytica* only. And was not significant between hand washing practice after defecation. Relationship between intestinal parasites and sanitary practices was statistically significant (P <0.05).

The highest group (34.3%) of children are 7-8 years old, 24.3% are years old. Mean age is 7.71 years, median 8 and SD 1.26 (Table-1)

Table-1. Distribution of the children by age.

Age of the Children (Years)	Frequency	Percent
6 – 7	20	14.3
7 – 8	48	34.3
8 -9	34	24.3
9 – 10	24	17.1
10	14	10.0
Total	140	100.0

Fathers (34.3%) had education below SSC and 28.6% were illiterate (Table-2)

Table 2: Distribution of the guardian of the Children by literacy rate.

Literacy	Frequency	Percent
Illiterate	40	28.6
Below SSC	48	34.3
SSC to HSC	28	20.0
Above HSC	24	17.1
Total	140	100.0

Most of the children's (41.4%) guardian's monthly family income was Tk. 3001 - Tk 4500 (Table-3).

Table 3: Distribution of the children by monthly family income of the guardian.

Monthly family income (Taka)	Frequency	Percent
Tk. 1,500 to 3,000	24	17.1
Tk. 3,001 to 4,500	58	41.4
Tk. 4,501 to 6,000	32	22.9
Above Tk. 6,000	26	18.6
Total	140	100.0

Using sanitary latrine greatly reduced the occurrence of *Ascaris lumbricoids* and *Giardia lamblia* 6.7% and 13.3% respectively than those who use non sanitary latrine 18.2% and 17.3% respectively and was significant statistically ($P < 0.05$).

Table 4 : Relationship between latrine sanitation and prevalence of different helminthes in children.

Latrine sanitation	AL		AD		TT		GL		EH		Total
	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	
Sanitary	28	2	30	0	28	2	26	4	27	3	30
	93.3%	6.7%	100.0%		93.3%	6.7%	86.7%	13.3%	90.0%	10.0%	21.4%
Non-Sanitary	90	20	107	3	103	7	91	19	108	2	110
	81.8%	18.2%	97.3%	2.7%	93.6%	6.4%	82.7%	17.3%	98.2%	1.8%	78.6%
Total	118	22	137	3	131	9	117	23	135	5	140
	84.3%	15.7%	97.9%	2.1%	93.6%	6.4%	83.6%	16.4%	96.4%	3.6%	100%

$\chi^2 =$ 3.399 11.287 0.351 3.760 5.006
 $df =$ 1 1 1 1 1

Shows that good sanitation are found likely to develop GL (7.1%), AL (14.3%), than those having hand wash before meal with water (Only water, with ash, with soil)GL 17.5%, AL (15.9%) respectively and found significantly statistically ($p < 0.05$) (Table- 6)

- Not applicable for hookworm infestation.

Table: 5 Relationship between practice of hand wash before meal and prevalence of different helminthes in children.

Hand wash before meal	AL		AD		TT		GL		EH		Total
	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	
With water only	106	20	123	3	119	7	104	22	123	3	126
	84.1%	15.9%	97.6%	2.4%	94.4%	5.6%	82.5%	17.5%	97.6%	2.4%	90.0%
With soap and water	12	2	14	0	12	2	13	1	12	2	14
	85.7%	14.3%	100.0%	0	85.7%	14.3%	92.9%	7.1%	85.7%	14.3%	10.0%
Total =	118	22	137	3	131	9	117	23	135	5	140
	84.3	15.7%	97.9%	2.1%	93.6%	6.4%	83.6%	16.4%	96.4%	3.6%	100.0%

$\chi^2 =$ 0.827 0.559 1.596 1.170 5.186
 $df =$ 1 1 1 1 1

Shows that occurrence of intestinal parasitosis reduced by the habit of hand those who don't hygienic practice and found significant (for AL, TT, GL) but not statistically significant.

Table: 6 Relationship between habit of hand washing after defecation and prevalence of different helminthes in children.

Hand wash after habit defecation	AL		AD		TT		GL		EH		Total
	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	
Practiced	23	3	26	0	24	2	20	6	25	1	26
	88.5%	11.5%	100.0%	0	92.3%	7.7%	76.9%	23.1%	96.2%	3.8%	18.6%
Not Practiced	95	19	111	3	107	7	97	17	110	4	114
	83.3%	16.7%	97.4%	2.6%	93.9%	6.1%	85.1%	14.9%	96.5%	3.5%	81.4%
Table=	118	22	137	3	131	9	117	23	135	5	140
	84.3%	15.7%	97.9%	2.1%	93.6%	6.4%	83.6%	16.4%	96.4%	3.6%	100%

$\chi^2 =$ 3.598 3.367 1.509 1.726 1.291
 $df =$ 1 1 1 1 1

Shows that wearing shoes in the latrine reduces prevalence of AD and GL, but does not reduce any other helminth infestation. This relationship is not statistically significant ($p < 0.05$) (Table- 8).

Table: 7 Relationship between habit of wearing shoes in latrine and prevalence of different helminthes in Children

Habit of Wearing Shoes in latrine	AL		AD		TT		GL		EH		Total
	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	
Practice	96	18	113	1	106	8	96	18.	109	5	114
	84.2%	15.8%	99.1%	0.9%	93.0%	7.0%	84.2%	15.8%	95.6%	4.4%	81.4%
Not Practice	22	4	24	2	25	1	21	5	26		26
	84.6%	15.4%	92.3%	7.7%	96.2%	3.8%	80.8%	19.2%	100%		18.6%
Total	118	22	137	3	131	9	117	23	135	5	140
	84.3%	15.7%	97.9%	2.1%	93.6%	6.4%	83.6%	16.4%	96.4%	3.6%	100%
$\chi^2 =$	16.79		4.68		4.55		5.75		9.00		
df =	1		1		1		1		1		

Discussion

Among the parasite positive children *G. lamblia* was found in highest number of individuals (37.1%), and infestation with mixed parasites were found in lowest (4.8%) number of individuals. Presence of other parasites were: AL (22%), AD (3%), TT (9%), GL (23%) and EH (5%) children respectably.

In this study out of 140 children 62 (44.3%) were found to have parasites in stool. The findings were slightly higher in female (52.9%) than the male (47.1%) which is not statistically significant ($P > 0.05$). This study findings are found similar to those of Latif MA (1995)² and Muttalib et al (1975)⁴ where finding were, boys (57.7) and girls (42.23%). Both the study showed that sex plays little role in the development of intestinal parasitism.

At a glance, it is apparent that the findings of this study are not similar to other studies as this study shows the lower percentage of Hookworm infestation (2.1%) and higher percentage of *Giardia lamblia* (16.4%) where findings of the studies of Muttalib et al (1975)⁴ and Nuruzzaman M, Huda Q, (1969)⁵ are inversely proportional e.g for Hookworm 37% & 50% and for *G. lamblia* 18.7 & 12.3% respectively. Reduction hookworm infestation may be due to increase foot wear habit in contrast with the findings of Giardiasis increased for improper sanitary practices and relationship was statistically significant.

This study show the lower infestation is higher in low income group than those of high income family. This study co-relates with the finding of

the study of Nurul Huq, Aneema A Sheikh⁷ where it was observed that economic conditions play a vital role in the occurrence of intestinal parasitosis.

From this study it is clearly evident that use of sanitary latrines by children markedly reduce of parasitic infestation than those of using non-sanitary latrines. This study is supported by the study of Latif MA (1995)² where sanitary and non-sanitary latrine users harbors parasite 13.2% and 29.3% respectively.

Distribution of intestinal parasites according to hand washing habit of the children is found to play a significant role in the development of intestinal parasitic infestation. Washing of hand with soap before meal and after defecation showed a marked reduction in overall distribution of intestinal parasites and statistically was not significant in case of hand washing habit before meal ($P < 0.05$). It may be due to the fact that washing hand with only plain water without any soap.

Soil and ash are not sufficient to make it properly clean as expected. On the other hand, cleaning hand with soap and water make the hand clean adequately, though not made it absolutely parasite free. This findings support the study of Latif MA (1995)² who also reported a decreased distribution of intestinal parasites among population who cleaned their hands with soap and water.

From this study, it is found that prevalence of intestinal parasites according to health complaints are much higher in population who has reported relevant health complaints of intestinal parasitosis (67.9%) than those population having no health

complaints (32.1%). Symptoms of intestinal parasitoids though less specific yet can not be overlooked and may be used as a field tool for epidemiological survey, especially in the country of Bangladesh. This study findings support the findings of Huq et al (1974-75)⁷ who also reported a lower prevalence of intestinal parasitoids amongst asymptomatic population (12.36%) than those of symptomatic population (23.39%).

Conclusion

A high index of intestinal parasitosis usually signifies the deficiencies in environmental sanitation, poor standard of living and inadequate sanitary practice. It is clearly evident that distributions of the parasitic infestation among the rural children are still much higher than those of the developed countries. From base line information it might be useful to the higher authority of communicable disease control program and NGO in taking appropriate measures for prevention and control of intestinal parasitosis among them.

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