

## Intestinal Parasitic Infestation among the Outdoor Patients of Dhaka University Medical Centre, Bangladesh

Hamida Khanum\*, Md. Mizanur Rahman, Md. Hafiz Uddin<sup>1</sup>, Shahela Alam, Fatema Rahman and Rimi Farhana

Department of Zoology, University of Dhaka, Dhaka-1000, Bangladesh

<sup>1</sup>Laboratory Sciences Division, ICDDR, Mohakhali, Dhaka-1212, Bangladesh

\*Corresponding author, e-mail: hamida\_khanum@yahoo.com

---

**Abstract:** In the present study, the prevalence of intestinal parasitic infestation was investigated among the outdoor patients including teacher, student and staff of the Dhaka University treated at Dhaka University Medical Centre. A total of 380 stool samples were examined. Four species of intestinal parasites were identified, two protozoans (*Entamoeba histolytica* and *Giardia intestinalis*) and two nematodes (*Ascaris lumbricoides* and *Trichuris trichiura*). The prevalence of parasitic infestation was 24.73%. The prevalence of *E. histolytica* was 3.95%, *G. intestinalis* 6.31%, *A. lumbricoides* 11.84% and *T. trichiura* 2.63%. The prevalence was higher in case of staff (32.31%) and lower in case of teacher (13.16%). Highest prevalence observed during the rainy season (29.3%) and lowest in winter (19.4%). Female patient showed higher prevalence (31.25%) compared to male (24.14%). The rate of infection was higher (28.3%) among the patients, who used to drink unboiled water. The present study revealed that parasitic infection among the outdoor patients of Dhaka University Medical Centre is alarmingly high.

**Key words:** Dhaka University Medical Centre, intestinal parasites, outdoor patients

---

### Introduction

Parasitic infestation is a common health problem around the globe specially in the developing countries. It impose a continual and unacceptable threat to the well being of millions of people in the tropics and subtropics and the cost of parasites in terms of human misery and economic loss is incalculable (Cox, 1982). The prevalence of intestinal parasites in Bangladesh is very high (Muazzem & Ali, 1969). In Bangladesh infestation of intestinal protozoa and helminth parasites such as *Entamoeba histolytica*, *Giardia intestinalis*, *Ascaris lumbricoides* and *richuris trichiura* is a major public health problem both in rural and urban areas with a wide spread endemicity (Khanum *et al.*, 1998 & Muttalib, 1976). In 1999 a study was conducted by Khanum *et al.* among the children of lower income group employees of the University of Dhaka and found 47.26% nematode infections of which 20.39% was positive for *A. lumbricoides*, 15.3% was positive for *T. trichiura* and 11.57% for both.

In our country majority of the people are fighting with poverty, low living condition, unhygienic surrounding etc. These factors are related and act as the basic cause for the wider prevalence of intestinal parasitic infestations. At least 2200 million people in the world suffer from one or more type of helminths infection.

Intestinal protozoans show more or less similar life cycle. The infective stages are sensitive to desiccation and have a limited ability to survive at ambient temperature. The cyst is infective when ingested with food and water through faecal-oral contamination. After passing through the stomach, the cyst hatches in the small or large intestine. Most of the helminth's ova require a period of time in the environment for their development into infective larval form. The fertile soil, humidity, temperature and other environmental factors contribute and favours the protozoan and helminth parasites infection and transmission (Khanum *et al.*, 2008).

Among protozoa, *E. histolytica* is responsible for amoebic colitis and amebic liver abscess (ALA), *G. intestinalis* also causes infertile diarrhoea. The intestinal helminthes may present asymptotically or may cause mild or severe diseases such as anaemia but generally producing symptoms like abdominal pain, vomiting (Saha and Chowdhury, 1961). Besides, there are other symptoms like anorexia, nausea, diarrhoea etc (Chatterjee, 1980 and Cox, 1982). The present study aimed to observe the infection rate among three communities of the University of Dhaka referred to the outdoor of the Dhaka University Medical Centre and also the seasonal variation of infections.

## Materials and Methods

The present investigation is a comparative study of intestinal parasitic infestation among the outdoor patients [teachers, students, staffs (other than teachers)] of Dhaka University Medical Centre from different socio-economic status. The study was carried out from November 2003 to October 2004.

Stool samples were collected from the supplied container from the Medical Centre. The stool samples were carried to the Parasitology Laboratory, Department of Zoology, University of Dhaka for microscopic examination. Under electric compound microscope (Olympus, Japan) stool samples were examined for trophozoites and cysts of protozoan, ova and larvae of helminths. For microscopic examination, both saline preparation and iodine preparation were performed. Parasites were identified according to Cheesbrough (1987) and the season defined according to Chowdhury (1979).

## Results and Discussion

A total of 380 stool samples were collected from November 2003 to October 2004, who were referred to the Diagnostic Centre by different doctors. Out of 380 patients, 94 (24.73%) found infected with intestinal protozoa or helminth. Among the infections, prevalence of *E. histolytica* was 3.95%, *G. intestinalis* was 6.31%, *A. lumbricoides* was 11.84% and *T. trichiura* was 2.63%. Prevalence of *A. lumbricoides* was highest (11.84%) over the other intestinal parasites whereas, lowest prevalence was (2.63%) observed in case of *T. trichiura*. *G. intestinalis* infection (6.31%) and found common among the patients.

Highest incidence of parasites was observed in case of University staff, which was 32.31%. Out of 277 students, 68 (24.55%) showed infection with intestinal parasites. In teacher category, infection rate was 13.16%, which was the lowest rate of infection. *G. intestinalis* (9.23%) and *T. trichiura* (6.15%) showed highest prevalence in case of staff category, while *E. histolytica* showed highest prevalence (5.26%) among the teachers, and *A. lumbricoides* showed (12.63%) among the students. No *G. intestinalis* and *T. trichiura* infection was observed in case of teacher category (Table 1).

Highest prevalence of *E. histolytica* was observed (5.09%) during the rainy season and lowest

(2.32%) in the winter. In case of *G. intestinalis* similar trends were observed, highest prevalence (7.0%) during the rainy season and lowest (5.42%) in the winter. In case of *T. trichiura*, highest prevalence (3.19%) was observed in the summer and lowest (1.91%) during the rainy season (Table 2).

Among 380 patients, 91.58% was male and 8.42% was female. In male 23.85% was found to be infected with intestinal parasites but in female it was 34.37%, which was higher than in male. The present study covered all the seasons of the year. The highest (29.3%) incidence was found during the rainy season and the lowest (19.38%) in the winter season. In summer, prevalence was 24.47%. In both summer and rainy season female showed higher prevalence (44.44% and 35.29% respectively). In females while, in the winter highest prevalence (19.51%) was observed in male (Table 3).

Regarding the monthly infestation, the prevalence of infection was highest (50%) among staffs in the month of February and October. The infestation was nil for teachers in the months of February, April to August and December, and in case of staffs in the month of September and December. In student category, highest prevalence (40%) was recorded in the month of December and lowest (8.33%) in January (Fig. 1). During the study period four peaks were observed in months of December, May, July and September and only one small peak in the month of February (Fig. 2).

Highest prevalence (28.29%) of infection was observed among the patients who were used to take unboiled or supplied water for drinking purposes compared to boiled or filtered water consumer (17.82%). Out of 277 students, 196 used supplied water for drinking purposes and showed a prevalence of 26.53% for intestinal parasites (Table 4).

The intestinal parasites of human have received very little attention in Bangladesh. In 1975, Islam, *et al.*, examined 933 students of Dhaka University and found 57.33% of the student infected with single or multiple intestinal parasites such as *E. histolytica*, *A. lumbricoides*, *T. trichiura* etc. Begum & Rahman (1975) studied the intestinal helminth and protozoa. They reported five species of protozoan (*E. histolytica*, *E. coli*, *Endolimax nana*, *Iodamoeba butschlii*, *G. lamblia*) and four species of helminthes (*A. lumbricoides*, *Ancylostoma duodenale*, *T. trichiura* and *Enterobius vermicularis*). Muttalib (1976) reported *E. histolytica*, *E. coli*, *G. intestinalis*, *A. lumbricoides*,

*A. duodenale*, *T. trichiura*, *Fasciola buski*, *Strongyloides*, *Hymenolepis nana* and *E. vermicularis* from rural children of Bangladesh.

Chowdhury (1979) investigated intestinal parasitic infection in the population of Dhaka city. He reported eight species of parasites and showed

52.76% prevalence among the people of Dhaka city. Muttalib (1976) reported 99.03% prevalence of parasitic infection among the rural children of Bangladesh. Khaled (1983) reported 45.2% of the soldiers of Bangladesh Rifles were infected with intestinal parasites.

Table 1: Intestinal parasitic infestation among the teachers, students and staffs of the University of Dhaka.

Parasites	Teachers			Students			Staffs		
	Total number examined	No. infected	Prevalence (%)	Total number examined	No. infected	Prevalence (%)	Total number examined	No. infected	Prevalence (%)
<i>E. histolytica</i>	38	2	5.26	277	9	3.24	65	4	6.15
<i>G. intestinalis</i>	38	0	0	277	18	6.49	65	6	9.23
<i>A. lumbricoides</i>	38	3	7.89	277	35	12.63	65	7	10.76
<i>T. trichiura</i>	38	0	0	277	6	2.16	65	4	6.15
<b>Total</b>	38	5	13.16	277	68	24.55	65	21	32.31

Table 2: Intestinal parasitic infestation among the outdoor patients of the University of Dhaka in different seasons.

Parasites	Winter			Summer			Rainy		
	Total number examined	No. infected	Prevalence (%)	Total number examined	No. infected	Prevalence (%)	Total number examined	No. infected	Prevalence (%)
<i>E. histolytica</i>	129	3	2.32	94	4	4.25	157	8	5.09
<i>G. lamblia</i>	129	7	5.42	94	6	6.38	157	11	7.00
<i>A. lumbricoides</i>	129	11	8.52	94	10	10.63	157	24	15.28
<i>T. trichiura</i>	129	4	3.10	94	3	3.19	157	3	1.91
<b>Total</b>	129	25	19.38	94	23	24.46	157	46	29.26

Nuruzzaman & Huda (1974) carried out a study in the patients of hospitals of different age group and found a parasite incidence of 70%. They reported prevalence rates, 50% for hookworms, 41% for *A. lumbricoides*, 13% for *E. histolytica*, 12% *G. intestinalis*. Kuntz (1960) made an examination of stool on Tejgaon polytechnic, Mirpur and Demra Secondary School children for intestinal parasitic infection. He found 66% prevalence for *A. lumbricoides*, 48% for hookworms, 56% for *T. trichiura* and 33% for *E. vermicularis*. Ahmed (1989) showed that 10.94% of school children of Riyadh, Saudi Arabia were infected with intestinal parasites.

Among the patient of Dhaka University Medical Centre, the prevalence of infection was higher in females (34.37%) than male (23.85%). Muttalib & Islam, 1976 reported higher (57.77%) prevalence of infection in boys than girls (42.23%).

Chowdhury (1979) showed higher (62.1%) prevalence in female than in male (50%) while, Oyerinde *et al.* (1977) observed a more or less equal percentage of infection among male and female (9.2% and 9.4% respectively).

Staffs (all classes) of the University of Dhaka showed highest prevalence of parasitic infestation compared to other two categories. It may be due to the lack of health education and awareness about parasitic infections among them. *A. lumbricoides* was the most dominant among the intestinal parasites found in the present study and most prevalent among the student category. In the light of the present study it can be concluded that the people of the University of Dhaka have higher prevalence of gastrointestinal parasites. The infection of the parasites has relationships with habit, hygienic knowledge, management and other ecological factors.

Table 3: Prevalence of intestinal parasites among the male and female patients in different seasons.

Seasons	Sex	Total sample examined	Total number of infection	Prevalence (%)
Winter (November-February)	Male	123	24	19.51
	Female	6	1	16.66
	Combined	129	25	19.38
Summer (March-June)	Male	85	19	22.35
	Female	9	4	44.44
	Combined	94	23	24.47
Rainy (July-October)	Male	140	40	28.57
	Female	17	6	35.29
	Combined	157	46	29.3
Total	Male	348	83	23.85
	Female	32	11	34.37

Table 4: Prevalence of parasitic infestation in relation to the use of boiled and unboiled water for drinking purposes.

Residences	Sources of water used	Total samples examined	No. infected	Prevalence (%)
Teachers living in quarters	Boiled/filtered	38	5	13.15
	Unboiled/supplied	0	0	0
Student living in house	Boiled/filtered	78	15	19.23
	Unboiled/supplied	3	1	33.33
Students living in dormitory	Boiled/filtered	0	0	0
	Unboiled/supplied	196	52	26.53
Staffs living in quarters	Boiled/filtered	13	3	23.08
	Unboiled/supplied	52	18	34.61
Total	Boiled/filtered	129	23	17.82
	Unboiled/supplied	251	71	28.29

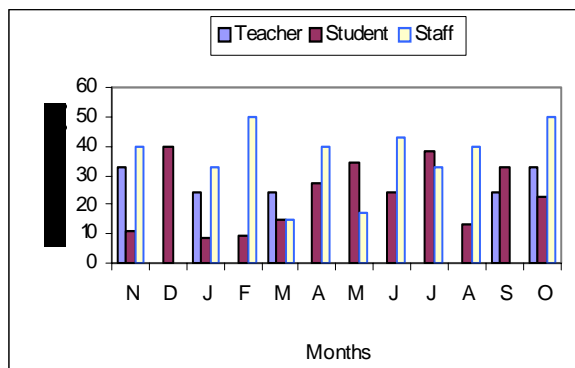


Fig. 1: Monthly prevalence of intestinal parasites among the teachers, students and staffs of the University of Dhaka.

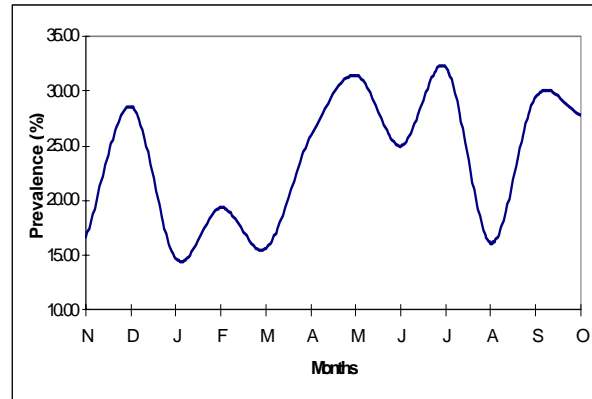


Fig. 2: Monthly prevalence of intestinal parasites among all the outdoor patients (combined) of the University of Dhaka.

## References

- Ahmed, M.M. 1989. A preliminary survey of parasitic infections and nutritional status among school children in Riyadh, Saudi-Arabia. *J. Egypt Soci. Parasitol.* **19**: 101-105.
- Begum, N.N. & Rahman, K.M. 1975. Comparative finding of helminth and protozoa by various techniques. *Bang. Med. J.* **4**: 8-12.
- Chatterjee, K.D. 1980. *Parasitology (Protozoology and Helminthology) in relation to clinical medicine*. 12<sup>th</sup> Ed. Chatterjee Medical Publisher, Calcutta. 186 pp.
- Chessbrough, M. 1987. *Medical Laboratory Manual for Tropical Countries*. Vol I: *Parasitology*. 2nd Edn. Tropical Health Technology and Butterworth, London. 603 pp.
- Chowdhury, M.R. 1979. Intestinal parasitic infection in privileged class of Dhaka population, Bangladesh. *Armed Forces Med. J.* **4**: 5-12.
- Cox, F.E.G. 1982. *Modern parasitology*. Blackwell scientific publications, Oxford London. 569 pp.
- Islam, A F M., Sadeque, M., Biswas, K., Ahmed, M. & Mahmood, G. 1975. Helminthiasis and anaemia in student of Dhaka University. *Bangladesh Medical Research Council. Bulletin.* **V(II)**: 40-45.
- Khaled, G.A.1983. Incidence of intestinal parasitic infection in Bangladesh Rifles. *Bang. Armed Forces Med. J.* **7**: 29-31.
- Khanum, H., Ahmed, S., Uddin, M.H., Rahman, A.B.M.M., Dey, R.R. & Farhana, R. 2008. Prevalence of intestinal parasites and anaemia among the slum male children in Dhaka city. *J. Biol. Sc.* (Accepted in March 2008).

- Khanum, H., Islam, N. & Dhar, T. 1998. Prevalence of *Ascaris lumbricoides* and *Trichuris trichiura* among the children of four slum areas of Dhaka city. *Univ.J. of Zool. Rajshahi University*. **16**: 89-94.
- Khanum, H., Islam, N.M. & Nahar, K.N. 1999. Intestinal nematode infestation among children of lower income group employees in Dhaka city. *Univ.J. of Zool*. **16**: 89-94.
- Kuntz, R.E. 1960. Intestinal protozoa and helminthes in school children in Dacca, East Pakistan (East Bengal). *Am. J. Trop. Med. & Hyg*. **9**: 168-173.
- Muazzem, M.G. & Ali, T. 1969. Incidence of intestinal parasites among children East Pakistan. *Medicus*. **25**: 21-215.
- Muttalib, M.A. 1976. Intestinal parasites among University of Dhaka students. *J. Trop. Med. Hyp*. **78**: 10-11.
- Muttlib, M.A. & Islam, A.S.M. 1976. Prevalence of intestinal parasites in rural children of Bangladesh. *Bangladesh Medical Research Institute Journal*. Vol. **4(1)**: 11-27.
- Nuruzzaman, M. & Huda, O. 1974. Parasitic infestation in gastrointestinal tract disorder. *Bang. Med. J*. **6**: 67-72.
- Oyerinde, J.P., Ogunbi, O. & Alonge, A.A. 1977. Age and sex distribution of infections with *Entamoeba histolytica* and *Giardia intestinalis* in the Lagos population. *Int J Epidemiol*. **6**: 231-234.
- Saha, A. & Chowdhury, A.B. 1961. Helminthic infection in under five children in Rangpur and Dinajpur district. *Bang. Med. J*. **16**: 7-11.