

PREVALENCE OF INTESTINAL PARASITES AMONG THE OUTDOOR PATIENTS OF IBN SINA HOSPITAL, DHAKA

Rimi Farhana Zaman, Sabekunnahar and Hamida Khanum

Parasitology Branch, Department of Zoology, University of Dhaka, Dhaka-1000.

Abstract

The present study was done to find out the incidence of the intestinal parasites and their prevalence among male, female and children of the outdoor patients of IBN sina hospital, Dhanmondi, Dhaka. A total of 350 stool samples were collected from different aged patients and examined from IBN Sina hospital. Four species of intestinal parasites were identified, of which two species were protozoa (*Entamoeba histolytica* and *Giardia sp.*) and two species were nematode (*Ascaris lumbricoides* and *Trichuris trichiura*). The overall prevalence of infestation was 24.28%; *Entamoeba histolytica* 4.85%, *Giardia sp* 2.28%, *Ascaris lumbricoides* 4.28% and *Trichuris trichiura* 12.85%. The highest prevalence (28%) prevalence was observed in male patients, lowest in 22.5% in female and 24% in children. The prevalence was highest (29.52%) in rainy season and lowest (21.05%) in winter season.

The prevalence was highest (41.66%) in male during the month of April'10. The highest prevalence was found in 26-35 years age group in male and the rate was 37.03% and the lowest prevalence was found in 56-65 years age group and the rate was 13.33% in male. The highest prevalence recorded (29.72%) in female during the month of July' 10. The highest prevalence (40%) was found in children during the month of August'10 & October'10. The children of 4-9 age groups were found vulnerable (31.25%).

Key words: Intestinal parasites, prevalence, outdoor patients, children.

Introduction

A disease is an abnormal condition affecting the body of an organism. It is often construed to be a medical condition associated with specific symptoms and signs. It may be caused by external factors, such as infectious disease, or it may be caused by internal dysfunctions, such as autoimmune diseases. In humans, "disease" is often used more broadly to refer to any condition that causes pain, dysfunction, and distress, social problems, and/or death to the person of its body. The intestinal infection caused by parasite common in Bangladesh, which includes protozoa, helminthes and bacteria. Different intestinal infection in different age groups such as young children as well as adult is not uncommon. In our country majority of the people are fighting with poverty, low living condition, unhygienic surrounding, lack of sanitary latrine. These factors are related and act as the basic cause for high prevalence of the protozoan and helminthes. 2200 million people in the world suffer from one or other type of helminthiasis. Helminth infection due to nematode is a major public health problem in the developing and underdeveloped countries including Bangladesh. The prevalence of intestinal parasite in Bangladesh is very high^[1] 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, 1980-1990.

The life cycle of intestinal protozoan *Giardia intestinalis* & *Entamoeba histolytica* are alike. The infective cyst form is sensitive to desiccation and has a limited ability to survive at ambient temperature. The cyst is infective when passed and can be ingested from faecally contaminated hands, food and water. After passing through stomach, the cyst hatches in the large or small intestine. The common nematodes found in

Bangladesh are *Ascaris lumbricoides* and *Trichuris trichiura*. The intestinal parasite may present asymptotically or may cause mild or severe diseases, generally producing symptoms

like abdominal pain, vomiting^[2]. Besides this there are other symptoms like anorexia, nausea, diarrhea, indigestion etc^[3]. Some of them may produce severe clinical manifestation like anemia, obstruction, perforation of gastrointestinal tract through peptic ulcer which causes secondary infection of bacteria^[4].

Helminth infection may cause obstructive jaundice and acute appendicitis. Mixed infection particularly round worm (*Ascaris lumbricoides*) and whipworm (*Trichuris trichiura*) are common. This type of infection are common among malnourished with low immunity especially young children in South west Asia^[5]. In protozoan infection, the lesions are greatly influenced by proliferation, multiplication, and metastasis to distant organ. In *Entamoeba histolytica* the trophic form secrete a powerful histolytic toxin causing destruction of the tissues. In the majority of helminthic infection, the adult parasites are found inside the human body and no multiplication occurs except in case of strongyloidiasis and hymenolepiasis. It is the number of invading organisms gaining entrance during primary infection and re-infection that constitutes the most important problem in the development of clinical manifestations in helminthiasis. The effects produced therefore depend upon their habitat. In certain helminthic infections, the normal secretion and excretion of the growing larvae and the product liberated from dead parasites behave like foreign proteins and give rise to various allergic manifestations. The fertile soil, humidity, temperature and other environmental factors contribute and favours the protozoan and helminth parasites infection and transmission^[6].

Material and Methods

It was a community based prospective study to confirm affect of intestinal parasites among patients in IBN Sina hospital (male, female & children) of different age. The study was conducted in Pathological Laboratory of IBN Sina hospital during February 2010 to December 2010. A total 350 samples were collected from out door patients of this hospital, 100 of them males, 200 female and 50 children. During the study period the selected patients were first explained about the nature of intestinal problem. The patients were interrogated and the questionnaires were filled up.. For identification of the parasites and microscopic examination, zinc floatation technique was performed.

Result and Observation

A total 350 stool samples of patients were collected from Feb'10 to Dec'10, of which 100 (28%) from males, 200 (22.5%) from females & 50 (24%) from children. Whereas 95 stool samples of patient were collected only in winter seasons, 25 (26.31%) from males, 65 (68.42%) from females & 30 (5.26%) from children. From 150 stool samples in summer season, 45 (30%) were from males, 80 (53.33%) from females and 25 (16.66%) from children. But in rainy season, out of 105 stool samples 30 (28.57%) were from

males, 55 (52.38%) from females and 20 (19.04%) from children.. In the course of study, 4 species of gastrointestinal parasites were found during the examination of stool. Out of 4 species, 2 cysts of protozoan species (*E. histolytica* and

Giardia sp.) whereas 2 helminth ova were *A. lumbricoides* and *T. trichiura*. The presence of cysts and ova of the above parasites in the stool indicated the presence of mature stages of these parasites in the individuals.

Only 85 patients among 350 were infected with helminths and protozoa and the prevalence of infection was 24.28%. 25 positive cases were found for protozoan and prevalence was 71.42%. Only 60 cases were positive for helminth and the prevalence was 17.142%. Of all the patients, only 17 were positive for *E. histolytica* and the prevalence was 4.85%, 8 were positive for *Giardia* sp. and the prevalence was 2.28%, 15 were positive for *A. lumbricoides* and prevalence was 4.28%, 45 were positive for *T. trichiura* and prevalence was 12.85%. The overall percentage of male, female and children was 28.47%, 57.14% and 14.28% (Fig.-1). In winter, the prevalence of male, female and children were 26.31%, 68.42% and 5.26% but in summer it were 30%, 53.33% and 16.66%. In rainy seasons, the prevalence was 28.57%, 52.38% and 19.04% accordingly.

were examined, in which prevalence of infection of protozoa was 9.52% and helminthes was 20%.

The prevalence of *Entamoeba histolytica* was 3.15%, 4% and 3.80% and *Giardia* sp. was 2.10%, 2.66% and 5.71% respectively in 3 seasons. The prevalence of *Ascaris lumbricoides* was 3.15%, 7.33% and 6.66% and *Trichuris trichiura* was 12.63%, 9.33% and 13.33% respectively in 3 seasons (Table-1).

Out of 95 samples in winter 25 were male and only one was infected by *E. histolytica* and the prevalence was 4%. 65 samples were female and 2 were infected by *E. histolytica*. Only 5 samples were children and no one was infected by *E. histolytica*. So the prevalence of female and children were 3.07%, 0% respectively. only one male was infected by *Giardia* sp. and the prevalence was 4%. Out of 65 only one female was infected by *Giardia* sp. and the prevalence was 1.53%. No one was infected by *Giardia* sp in children (Table-2). The prevalence was highest (41.66%) in male during the month of April'10 and lowest (0%) in the month of December (Fig.-2).

A total 100 male, 200 female and 50 children were examined. The prevalence of infection in male, female & children were 21.05%, 23.33% & 29.52% respectively. Total 95 samples were collected in winter and examined of which 25 from male, 65 from female & 5 from children. Of them 7 male, 11 female & 2 children were infected by intestinal parasites. The prevalence of infection of male, female and children in winter was 28%, 16.92% and 40% respectively. In summer 150 samples were collected and examined of which 45 from male, 80 from female & 25 from children. Of them 9 male, 14 female and 12 children were infected by intestinal parasites. The prevalence of infection of male, female was children in summer were 20%, 17.5% & 48% respectively. In rainy season, total 105 samples were collected and examined of which 30 from male, 55 from female and 20 from children. Of them 12 male, 14 female and 5 children were infected by intestinal parasites. The prevalence of infection of male, female & children in rainy seasons was 40%, 24.45% and 25% respectively. In winter, the overall prevalence of infection of protozoa was 5.26% and helminthes was 15.78%. In summer total 150 samples were examined, in which prevalence of infection of protozoa was 6.66% and helminthes was 16.66%. In rainy Seasons, total 105 samples

The highest prevalence was found in 26-35 years age group and the rate was 37.03%. Lowest prevalence was found in 56-65 years age group and the rate was 13.33%. It was also found that prevalence rate increased after 16 years age group up to 46 years age group (Fig.-3). In female the highest prevalence was found (29.72%) during the month of July,10 and lowest (0%) during the month of November'10 & December, 10 (Fig.-4). The highest prevalence in female (30.43%) was found in 26-35 years age group and lowest (20%) in 36-45 years age group. Among children the highest prevalence (40%) was found during the month of August, 10 and October'10. The lowest prevalence (0%) was found during the month of February, March, November and December'10 (Table-3). The highest prevalence (31.25%) was found in 4-9 age groups. The lowest (20%) was found in 9-15 age groups in children (Fig.-5).

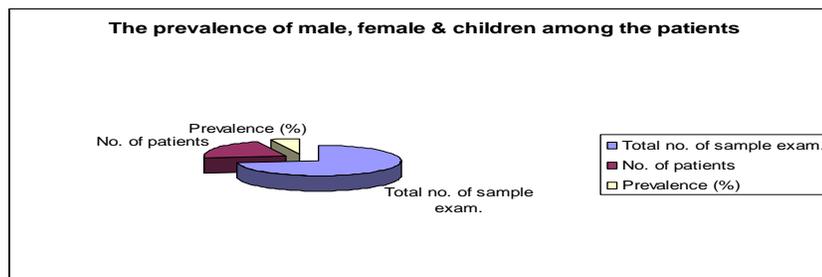


Fig: 1 The overall percentage of male, female & children among the patients.

Table-1: Prevalence of different parasites in 3 seasons among the patients.

Parasite	Winter			Summer			Rainy		
	Total sample exam.	No. of infection	Pre (%)	Total sample exam.	No. of infection	Pre (%)	Total sample exam.	No. of infection	Pre (%)
<i>Entamoeba histolytica</i>	95	3	3.15	150	6	4	105	4	3.80
<i>Giardia</i> sp.	95	2	2.10	150	4	2.66	105	6	5.71

<i>Ascaris lumbricoides</i>	95	3	3.15	150	11	7.33	105	7	6.66
<i>Trichuris trichiura</i>	95	12	12.63	150	14	9.33	105	14	13.33

Table2: Seasonal prevalence of intestinal parasites in male, female & children.

Seasons	Sex	<i>E. histolytica</i>			<i>Giardia</i>			<i>A. lumbricoides</i>			<i>T. trichiura</i>		
		Total sample exam.	No. of infected	Prev (%)	Total sample exam.	No. of infected	Prev (%)	Total sample exam.	No. of infected	Prev (%)	Total sample exam.	No. of infected	Prev (%)
Winter	Male	25	1	4	25	1	4	25	1	4	25	3	12
	Female	65	2	3.07	65	1	1.53	65	2	3.07	65	7	10.76
	Children	5	0	0	5	0	0	5	0	0	5	2	40
Summer	Male	45	2	4.44	45	1	2.22	45	3	6.66	45	5	11.11
	Female	80	3	3.75	80	3	3.75	80	5	6.25	80	8	10
	Children	25	1	4	25	0	0	25	3	12	25	1	4
Rainy	Male	30	2	6.66	30	1	3.33	30	2	6.66	30	7	23.33
	Female	55	1	1.18	55	5	9.09	55	3	5.45	55	5	9.09
	Children	20	1	5	20	0	0	20	2	10	20	2	10

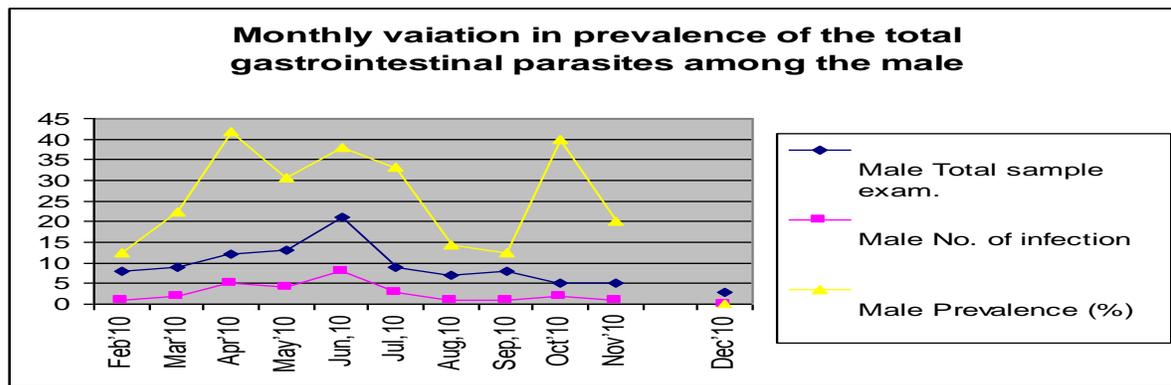


Fig-2 Monthly variation of prevalence of the total gastrointestinal parasites among the male.

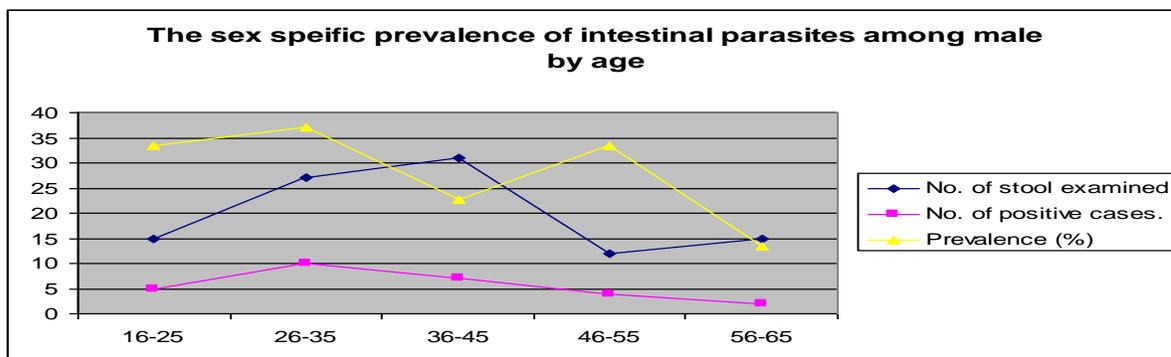


Fig: 3 Shows the prevalence of intestinal parasite of male by age.

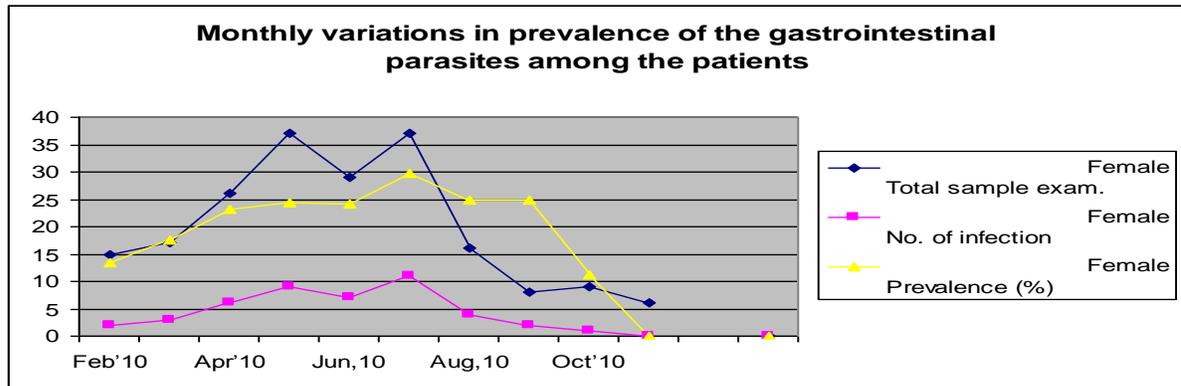


Fig-4 Monthly variation of prevalence of the total gastrointestinal parasites among the female.

Table-3: Monthly variation of prevalence of the total gastrointestinal parasites among the children.

Months	Children		
	Total sample exam.	No. of infection	Prevalence (%)
Feb'10	2	0	0
Mar'10	2	0	0
Apr'10	9	3	33.33
May'10	7	2	28.57
Jun,10	8	2	25
Jul,10	5	1	20
Aug,10	5	2	40
Sep,10	3	0	0
Oct'10	5	2	40
Nov'10	3	0	0
Dec'10	1	0	0

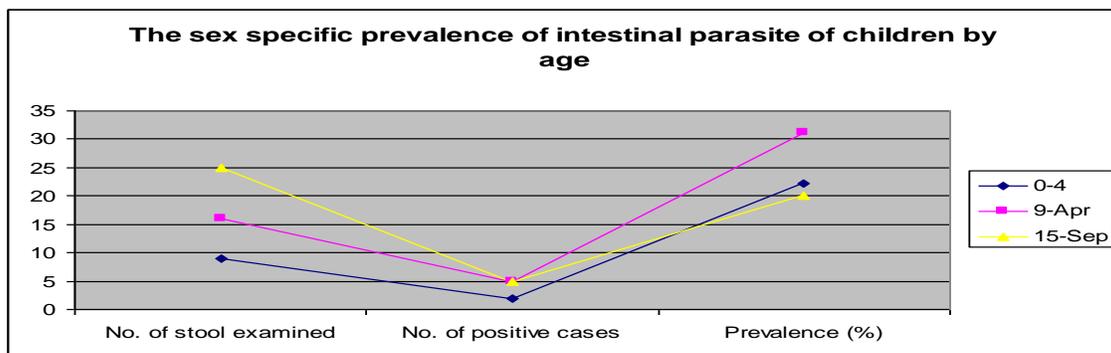


Fig: 5 Sex specific prevalence of intestinal parasites of children by age.

Discussion

In Bangladesh, the prevalence of infection of intestinal parasites is alarmingly high due to poor sanitation, poor hygienic habit, poor standard of living, lack of health education, ignorance, poverty, poor socioeconomic condition of the majority of population. The intestinal parasites of human beings have received very little attention from research workers in Bangladesh. [7] Khaled (1999) found eight species of parasites including *E. histolytica*, *E. coli*, *Giardia intestinalis*, *A. lumbricoides*, *Ancllyostoma duodenale*, *T. trichuira*, *Hymenolepis nana* & *Enterobius vermicularis* during his study, the incidence of intestinal parasitic infections in Bangladesh rifles. He reported that 45.2% of the soldiers were having intestinal parasites. [8]

Adeyeba and Dipeoli (1984) reported 51% of people of two local government areas, West Nigeria were infected with intestinal parasites. The probable cause of higher prevalence of infection in females may be due to low immunity, repeated pregnancy and lack of health education and malnutrition.

Intestinal helminth showed highest prevalence in the patients of the three seasons. In the patients of winter, the prevalence of infection of protozoa and helminth were respectively 26.31% in male, 68.42% in females and 5.26% in children. In summer, the overall prevalence of infection was 30% in male, female was 53.33% and the children were 16.66%. In rainy seasons, the prevalence of male was 28.57%, female was 52.38% and the children was 19.04%. [9] Kuntz (1960) showed that 66% of school children of Dhaka were infected with helminth [1] Muazzem and Ali (1969) showed 67% of prevalence of helminth among children of East Pakistan, [2] Saha and Chowdhury (1981) reported 75% of children (under

5 years) of Rangpur and Dinajpur districts were found to be suffering from helminth infection.

^[10] Alakija (1986) also found higher (44.2%) prevalence of protozoa than helminth (22.4%) in the rural people of Nigeria. ^[11] Malla *et. al* (2004) showed the prevalence of roundworm (*A. lumbricoides*) 14.22% and *Giardia sp.* was 9.33% in Nepal among children. ^[6] Khanum *et al.* (2010) identified four species of intestinal parasite among outdoor patients of Dhaka University Medical Centre; two protozoa (*E. histolytica* and *Giardia intestinalis*) and two nematodes (*A. lumbricoides* and *T. trichiura*). The prevalence of parasitic infestation was 24.73%. Highest prevalence observed during rainy seasons (29.3%) and lowest in winter seasons (19.4%). They also found lowest (3.95%) prevalence of *E. histolytica* and highest (11.84%) prevalence of *A. lumbricoides*. *E. histolytica* was the most common parasites in this survey. Male, female and children were infected with this protozoan. The prevalence of *E. histolytica* in winter was 4% in male, 3.07% in female and 0% in children. In summer the prevalence of *E. histolytica* was 4.44% in male, 3.75% in female and 4% in children. But in rainy seasons, the prevalence was 4% in male, 6.66% in female and 5% in children respectively.

Giardia sp. was second common parasite in the present study. The prevalence of *Giardia sp.* in winter was 4% in males, 1.53% in females and 0% in children. In the summer seasons, 2.22% in males, 3.75% in females and 0% in children. But in rainy seasons, 3.33% in males, 9.09% in females & 0% in children. The present study showed the prevalence of *Giardia sp.* was 2.10% in winter, 2.66% in summer and 5.71% in rainy seasons. *A. lumbricoides* is most common nematodes in Bangladesh. The prevalence of this parasite was 3.15% in winter, 7.33% in summer and 6.66% in rainy seasons. In winter, the prevalence was 4% in males, 3.07% in females and 0% in children. In summer, 6.60% in males, 3.07% in females and 12% in children. But in rainy seasons, 6.66% in males, 5.45% in females and 10% in children. ^[12] Shrestha (2001) found highest prevalence of *A. lumbricoides* (73.45%) and *T. trichiura* (27.27%) in school children of Lalitpur district in Nepal. The prevalence was 12.63% in winter, 9.33% in summer and 13.33% in rainy seasons. The prevalence of *T. trichiura* was highest in rainy seasons. In winter, 12% male and 10.76% females was infected with *T. trichiura*, and highest prevalence was found among children (40%). In summer, 11.11% males, 10% females and 4% children were infected with *T. trichiura*. But in rainy seasons, the prevalence was 23.33% in males, 9.09% in females and 10% in children. ^[13] Khatun reported (2000) highest 3.12% and 2% prevalence of infection among (1-5) age group in Padma Diagnostic Center and Arab Diagnostic Center. At this stage children took food with soiled hands and even pick up food from the ground.

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 countries. Most frequent intestinal helminthes in man are *Ascaris lumbricoides*, Hook worm and *Trichuris trichiura* which have a high prevalence 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- 1990. It is estimated that 10% health problems in developing countries are related to diarrhea and helminthes both of which are mostly water born. The present study has been done to find out the prevalence of intestinal parasitic infections among outdoor

patients of IBN SINA hospital including male, female and children. In the present study, the prevalence of protozoan and helminthiasis, factors responsible for such prevalence and possible measures may be taken for protozoan and helminthiasis were also recorded.

References

- [1] M. G. Muazzem, and T. Ali, Incidence of intestinal parasites among children of East Pakistan. *Medicus*, 25:21- 215, 1969.
- [2] Saha and A. B. Chowdhury, Helminthic infection in under 5 years children in Rangpur and Dinajpur districts . *Bang. Med. J.* 16(2):7-11, 1981.
- [3] K.D. Chatterjee, Parasitology 10th edition. Chatterjee Medical Publisher, Calcutta, pp-183-186, 1980.
- [4] T.C. Chang, The biology of animal parasites, W. B . Saunders comp Philadelphia and London, 1964, pp. 431 -432.
- [5] W.H.O. listed of estimated annual death ranked six parasites diseases, World Health Organization. Geneva . Switzerland, 1990.
- [6] H. KHANUM and S. FARZANA. Intestinal Parasitic Infestation among the Outdoor Patients of Dhaka University Medical Centre, Bangladesh. *Asian Pacific Journal of Tropical Medicine*, 745-747, 2010.
- [7] G. A Khaled, Incidence of intestinal parasitic infection in Bangladesh Rifles. *Bang. Armed Forces. Med. J.* 7 (1):29 -31, 1983.
- [8] O. A. Adeyeba, and O. O. Dipeolu, A survey of gastrointestinal parasites in a local government area of West Nigeria *Int . j. Zoon.* 11:10, 1984.
- [9] R. E. Kuntz., Intestinal protozoa and helminthes in School children in Dhaka, East Pakistan *Armed. J. Trop . Med. Hyg.* 9: 168-173, 1960.
- [10] W. Alakija, Prevalence or intestinal parasitic disease agents stool people in a rural area Nigeria. *Annual. Trop .Med. Parasitol.* 80, 5: 545-547, 1986.
- [11] MALLA, Prevalence of intestinal parasitic infection and malnutrition among children in a rural community in Nepal. *Journal of Nepal Medical Association.* 23:45-51, 2004.
- [12] Sheshtha, Intestinal parasitic infestation in healthy school children of Lalitpur District. *Journal of Nepal Medical Association.* 41: 266-274, 2001.
- [13] T. Khatun, Observation on occurrence of intestinal protozoan and helminth parasites in human in Dhaka city of Bangladesh, 2000.