

Study of Intestinal Parasitosis among School Going Children in Pokhara, Nepal

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ABSTRACT

The study was carried out in order to estimate the prevalence of intestinal parasitosis in school-going children in schools located in Pokhara, Nepal from November 2011 to January 2012. A total number of 100 stool samples were collected from children of ages 3 to 15 years. A questionnaire including the factors predisposing to parasitosis was filled up and parasitic examination was carried out by direct wet mount examination and concentration method using standard formal ether concentration technique. The prevalence rate was found to be 15%. Prevalence of parasitic infection was higher in girls (16%) than in boys (14%) and age group 8-12 years were found to be more suffering (17.3%) than other age groups. The occurrence of parasitic infection in symptomatic children was found to be 40% and 10% in asymptomatic children. The symptoms were found statistically significant with infestation of parasites. Intestinal infection was highest in Dalit students (20%) compared to other caste students. Prevalence of parasitic infection in other caste was 15% in Brahman, 9.5% in Newar and 9% in Chhetri. Among 15 positive cases 5 types of parasites were detected. The results showed *Giardia lamblia* to be the most common parasite. Occurrence of other intestinal parasites was *Entamoeba histolytica* (26.6%), *Ascaris lumbricoides* (26.6%), *Trichuris trichura* (6.6%) and Hook worm (6.6%). The study concluded that intestinal parasitosis is still public health problem among school going children of Pokhara valley especially among Dalit students.

Key words: Intestinal parasitosis, Formal ether concentration, Children, Pokhara, Nepal

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INTRODUCTION

Intestinal parasitic infections are most common in school going children and they tend to occur in high intensity in this age group.^{1,2,3} Higher prevalence of these infestations is closely correlated to poverty, poor environmental hygiene and impoverished health services.³ It is estimated that nearly 200 million people were infected with *Giardia lamblia* while *Entamoeba histolytica* infects 10% of the world population.⁴ In 1977 it was estimated that 45 million people carried *Entamoeba histolytica* in their intestine; 1/10th of them suffer from intestinal invasion as a result 70 thousand people die each year.⁵ Intestinal parasitosis is one of the major public health and socio economic problem in Nepal. A hospital based study have shown a declining trend during a period of ten years.⁶ Poverty, lack of awareness, failure to practice proper hand washing after defecation, unsafe drinking water and use of improper toilets are some of the reasons that are not totally eradicated from most of the parts of our country.^{3,7} Because of these reasons most of the school going children are still suffering from parasitic infections. Socio-economic and cultural factors and lack of adequate basic sanitation have caused the children of Nepal vulnerable to intestinal parasitic infections.⁷ An intestinal worm has been one of the major causes of visiting health care facilities in the country.

It was the number one cause of morbidity for the healthcare visit in the year 2008/2009.⁸

Hence the present study was carried out to find the present situation of the parasitic infections among school going children in Nadipur area of Pokhara Valley.

MATERIALS AND METHODS

This cross-sectional study was carried out from November 2011 to January 2012. A total number of 100 stool samples were collected from school going children of Pokhara Valley in appropriate container. Samples were processed in the laboratory of Novel Academy, New road, Pokhara. A questionnaire on age, sex, hygienic practices and gastrointestinal symptoms were filled and used for analysis. Each fresh stool was examined with naked eye and under microscope. Laboratory analyses of faecal samples were carried out by formal ether sedimentation technique.⁹

RESULTS

The prevalence of parasitic infection was 15% (15/100) in which 14% (7/50) were boys and 16% (8/50) were girls. Prevalence of parasitic infection was higher in girls than in boys but the difference was statistically insignificant.

Table 1: Gender wise distribution of intestinal parasites among school children

Gender	No. of Children	Positive Cases	Percent	p-value
Male	50	7	14	p=0.77
Female	50	8	16	
Total	100	15	15	

The occurrence of parasitic infection was highest in age group 8-12 years and lowest in age group 12-15 years; however, it was statistically insignificant.

Table 2: Age wise distribution of intestinal parasites among school children

Age group	No. of Children	Parasite positive	Percent	p-value
3-5 years	25	4	16.0	p=0.934
5-8 years	41	6	14.6	
8-12 years	23	4	17.3	
12-15 years	11	1	9.0	

The occurrence of parasitic infection in symptomatic (nausea, abdominal discomfort, diarrhea, cough, anaemia and foul stool) children was found to be 40% and in asymptomatic children 10%. The symptoms were found statistically significant with infestation of parasites.

Table 3: Symptoms wise distribution of intestinal parasites among school children

Symptoms	No. of Children	Positive cases	Percent	p-value
Symptomatic	15	6	40.0	p=0.003
Asymptomatic	85	9	10.0	
Total	100	15	15.0	

Among 15 positive cases 5 types of parasites were detected. The most common intestinal parasite was *Giardia lamblia* which was reported as 33.3% (5/15 cases). Occurrence of other intestinal parasites was 26.6% *Entamoeba histolytica* (4/15 cases), 26.6% *Ascaris lumbricoides* (4/15 cases), 6.6% *Trichuris trichura* (1/15 cases) and 6.6% Hook worm (1/15 cases) respectively.

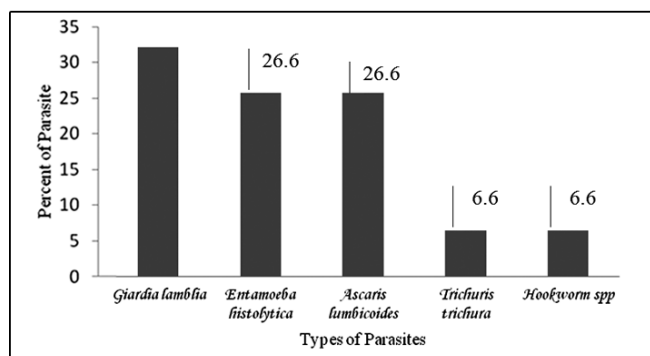


Figure 1: Frequency and category of parasites detected
Intestinal infection was highest in Dalit students.

Table 4: Caste wise distribution of intestinal parasites

Caste	No. of children	Frequency of positive cases	Percent
Brahman	13	2	15.0
Chhetri	11	1	9.0
Gurung	5	0	0.0
Newar	21	2	9.5
Dalit	50	10	20.0
Total	100	15	15.0

DISCUSSION

The prevalence of parasitic infection was 15% in this study which was similar to the study done by Kunwor in which the prevalence of parasites in school going children of Pokhara was 17.3%.¹⁰ In the study done by Chandrashekhar et al., the prevalence of intestinal parasites in school going children of Kaski district was found to be 21.3%.¹¹ A study conducted in two rural villages in Chitwan, Nepal in 1999 showed a 44% prevalence of intestinal parasites in school-going children.¹² The prevalence of parasitic infection in a study done by Sherchand et al., in 2010 in school going children of Kathmandu valley was 51.9%.⁶ Similarly the prevalence of parasitic infection in was reported to be 65.0% by Sherchand et al., in and Rai et al.^{13,14} The result obtained in this study was not in agreement with the result obtained by Uga et al., Meharaj et al., and various other scientist of the world who performed their research in place other than western part of Nepal.^{15,16} But the prevalence of the study is in close agreement with result obtained in similar study that was conducted in school going children of Pokhara Valley. This concludes that the differences in geographical setting, socioeconomic conditions, cultural practices, awareness programmes and the supply of drinking water can bring vast differences in the prevalence of parasitic infections in different parts of the world. The result also showed that prevalence of parasitic infection in school going children of Kathmandu was more than that of Pokhara. This may be due to poor water supply system, highly polluted environment and overpopulation of Kathmandu Valley.

In this study the prevalence of parasitic infection was higher in girls than in boys. The finding of the present study was in agreement with the finding of Sherchand et al., Kunwor Rup, Sherchand et al., and Rai et al., Sharma et al., Rajeshwory et al., Klinghtliner et al., But in the study done by Rajeshwory et al., and Klinghtler et al., parasitic infection was gender dependent.^{6, 10, 13,14,17,19} More prevalence of parasitic infection in female in this area may be due to uneducated lower cast parents who give more priorities to the health of their sons than their daughters. Furthermore the children in Kopildhunga of poor Dalit parents are not aware of using well managed latrine and higher amount of sample were taken from Kopildhunga area.

The occurrence of parasitic infection was highest in age group 8-12 years and lowest in age group 12-15 years. This finding was in agreement with the study done by Sherchand *et al.*⁶ The prevalence of parasitic infection was found higher in age group less than 10 years in the study done by Poudyal *et al.*²⁰ This may be due to the carelessness of the children towards their personal hygiene and engagement of this age group child in different types of games in polluted environment.

The occurrence of parasitic infection in symptomatic children was found to be 40% and 10% in asymptomatic children. The symptoms were found statistically significant with infestation of parasites. This finding was in agreement with the study done by Sherchand *et. al.*, Sherchand *et. al.*, Adhikari *et. al.*^{6,13,21} Intestinal infection was highest in Dalit students in this study. Similar result was obtained in study done from a remote hilly village of western Nepal in 2001 that showed a prevalence of 71.4% in the lower economic class people. Dalits comprised the majority.²¹ This can be attributed to their inaccessibility to safe drinking water, unhygienic personal habits due to lack of knowledge and awareness and also indirectly to their occupation as farmers.

Altogether 5 different types of intestinal parasites were detected in the stool samples. The most common intestinal parasite was found to be *Giardia lamblia*. Occurrence of other intestinal parasites was *Entamoeba histolytica* (26.6%), *Ascaris lumbricoides* (26.6%), *Trichuris trichura* (6.6%) and Hook worm (6.6%). In a study done by Chandrashekhar *et al* *Giardia lamblia* (13.2%), *Ascaris lumbricoides* (2.1%) and

Entamoeba histolytica (1.7%) were the commonest parasites isolated.¹¹ Similarly among these parasites incidence of *Giardia* was higher in the study done by Sherchand *et al.*⁶ So our finding was found to be in agreement with the finding of other scientists who performed their research in western part of Nepal. But the prevalence of helminthes infection was higher than that of protozoan and *Ascaris lumbricoides* was the commonest intestinal parasite isolated in a study done by Kunwor.¹⁰ Sharma *et. al.*, found the prevalence of helminthes infection was 76.9% and that of protozoa was 23.1%. Shakya *et al* found the infection rate of helminthes about 56.5% and that of protozoa 43.5%.^{17,23} This differences in result may be due to the differences in environment of area selected for research, time of research and socioeconomic condition of parents and children that are selected for research purpose.

CONCLUSION

Prevalence of parasitic infection in school going children school is decreasing but it is still prevalent as major public health problems in school children. *Giardia lamblia* was found to be the major causative agent of intestinal parasitosis in Pokhara. Dalit cast parents and children should be provided awareness programme related with parasitic infection. In order to prevent this infection appropriate health education should be given to children and their parents concerning disease transmission, personal hygiene and safe drinking water. Efforts from the municipality to improve the quality of drinking water supply and the types of toilets being used will certainly curtail the number of parasitic infections in Pokhara.

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