

Intestinal Parasitic Infection among School Age Children

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ABSTRACT

Background: World Health Organization estimates one-fourth of world's population harbors one or more intestinal parasites. Intestinal parasites are among the most common infections of school age children causing-nutritional deficiency, chronic dysentery, rectal prolapse, poor weight gains, retarded growth and mental retardation.

Methods: The stool samples were collected from school going children and examined for intestinal parasite by normal saline wet mount, formalin ether sedimentation technique was performed for the concentration.

Results: Among 360 school age students, the prevalence of intestinal parasite was found 40%. Among the positive cases of which 60% were female. It was observed that the rate of parasitic infection among positive cases, Newar was 35(36.84%), Chettri 31(32.97%) and Brahmin and others 29(33.72%) respectively. The study detects an association between intestinal parasitic infection and drinking tap water.

Conclusions: The findings of this study showed that intestinal parasitic infections remain prevalent in the study area. The high prevalence of parasitic infections seems directly related to the unhygienic living conditions. This strongly indicates a need for intervention measures likely-to take up sustained health education, provision of safe drinking water and improvement in environmental sanitation and to provide the school student with health education.

Keywords: *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Giardia lamblia*, intestinal parasitic infection, *Trichuris trichuria*.

INTRODUCTION

Intestinal parasitic infection has been a serious medical and public health problem in the world, especially in the developing countries. *Ascaris lumbricoides* (round worm) and *Ancylostoma duodenale* (hook worm), affect nearly one-fourth of the world's population.¹ Intestinal worms found in soils represent common health problems among school age children in developing countries. These children carry up to 1000 hookworm, roundworm and whipworm at a time which can cause anemia and other debilitating conditions, impaired learning, poor performance and absences from school.² WHO targets regular treatment of at least 75% of all school - age

children at risk of morbidity for schistosomiasis and soil-transmitted Helminthic infections by 2010.³

About 90% of the population of Nepal depends on agriculture. Its prevalent in rural communities constitutes an important cause of morbidity and mortality among Nepalese people.⁴ Overall helminthic infections alone rank fourth in the top ten lists of diseases in Nepal.⁵

METHODS

A cross-sectional descriptive study was conducted among school children studying at Government schools

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in the urban setting of Kavrepalanchowk. Three schools from Dhulikhel municipality ward numbers 1, 7 and 8 were selected randomly and were carried out from October 2008 to February 2009. The entire population of school going children at government schools was 6000 in Dhulikhel Municipality. The sample size (360) was determined using Cochran's sample size formula for categorical data.⁶

$$\left(n_o \right) = \frac{(t)^2 \times (s)^2}{(d)^2}$$

Ethical approval was obtained from the school committee before study was conducted. Self-administered questionnaire were distributed among students only after consent has been taken. Participants were informed that participation in the study will be voluntary and that they could end at any time.

Inclusion criterion for the study was restricted to all participants of school age. Three hundred sixty participants were selected through non-probability purposive sampling. Descriptive statistical analysis (frequency and percentage) and inferential statistics were done using statistical package for social sciences (SPSS) version 13.

RESULTS

The overall prevalence of parasitic infection was found to be 40% of which female was 60%.

Table 1. Distribution of respondents by ethnicity.

Ethnicity	Positive (%)	Total (n)
Brahmin	29 (33.72)	86
Newar	35 (36.84)	95
Chhetri	31 (32.97)	94
Others	49 (57.64)	85
Total	144	360

Regarding ethnicity of the respondents, Out of 86 Brahmins 29(33.72%) were positive, Chhetris 31(32.97%) were positive and Newar 35(36.84%) and others were 49(57.64%) positive (Table 1).

Table 2. Prevalence of intestinal parasitic infection among respondents.

Name of the intestinal parasites	N (%)
Ascaris lumbricoides (round worm)	35 (24.30%)
Trichuris trichuria (thread worm)	24 (16.66%)
Ancylostoma duodenale (hook worm)	22 (15.27%)
Giardia lamblia (giardia)	21 (14.58%)
Ascaris lumbricoides and Trichuris trichuria	21 (14.58%)
Trichuris trichuria and Ancylostoma duodenale	21 (14.58%)

Table 3. Water treatment habit with intestinal parasitic infection.

Type of water treatment	Positive (%)	Total	P-value
Treated	100 (69.44%)	221	-
Boiled	35 (35.0%)	91	0.001
Chlorinated	30 (30.0%)	61	
Filtered	35 (35.0%)	69	
Untreated	44 (30.55%)	139	
Total	144	360	

Among 360 students, 144 were positive, 100(69.44%) treat water and of which 30(30%) chlorinated water before drinking and 35(35%) treat water before drinking by both boiling and filtering (Table 3).

DISCUSSION

This study was carried out to determine the prevalence of intestinal parasitic infection among school age children and factors associated with it. So, the discussion on findings of the study has concentrated under the following topics.

The laboratory findings revealed that among the 360 students, 144(40%) were positive cases; of which cases 60% were female. Altogether 102(70.81%) children were infected with single type of parasites and 42(29.16%) with the mixed type. The commonly found helminthes were *Ascaris lumbricoides* 35(24.30%).

This small-scale study among school age children found the prevalence of intestinal parasitic infection to have 40% which is much lower than the finding of the study done in school going children in three districts of the Nepal namely Parsa, Surkhet and Dailekh reported by DoHS which was 74%.⁷ In study carried out in a remote hill rural area found the prevalence of intestinal parasitic infection to have 27.0%.⁸ Similarly prevalence of 31% as in the present study was reported in the Children's Hospital, Quetta, Pakistan.⁹ Another study carried out in Chandigarh, India revealed prevalence of intestinal parasitic infection among children of different age group to have 19.3%. Of the different intestinal parasites *Ascaris lumbricoides* was the most predominant parasite found in this study 35(24.30% among the infected group). In the same study done in Chandigarh (India), also found the *Ascaris lumbricoides* to be the most predominant parasite with the prevalence being 9.3% in the study children.¹⁰

Findings further revealed that all (negative and positive) cases were using sanitary latrine at home; the majority of the positive cases (69.44%) were drinking water purified by some or other methods; Further, all the respondents (mothers) maintained their personal

hygiene by cleaning hands with soap and water after defecation and by keeping finger nail short. In regard to food hygiene (hand washing before cooking, before serving and before eating) it was maintained in all 360 respondents' homes.

It is known that drinking treated water can reduce the prevalence of intestinal parasitic infection but in this study there was significant relationship of drinking treated tap water with that of intestinal parasitic infection ($p= 0.001$). A study done in Kaski district of Western Nepal revealed that intestinal parasitic infection among school children was mainly water borne disease.¹¹ Children drinking treated piped water had significantly higher incidence of intestinal parasitosis compared with children drinking natural water. The significantly higher incidence of intestinal parasitic infection among the children drinking treated tap water might probably be due to fecal contamination.

Calculated p-value for disposal of household waste was 0.175. Therefore, this study could not find a significant association between disposal of household waste and intestinal parasitic infection. A study done in rural area of Maharashtra, India also found an association of disposal of household waste with intestinal parasitic infection that shows that if the environmental sanitation is low, then it can give rise to high prevalence of parasitic infection.¹²

CONCLUSIONS

The intestinal parasitic infection among school age children is a major problem even in the urban municipality. This study detects an association between intestinal parasitic infection and drinking treated tap water. So, it can be prevented simply by modifying our behavior like treating water before drinking and providing health education at local level.

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