

## Prevalence of Intestinal Parasitic Infections among School Children of Dadeldhura District, Nepal

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### ABSTRACT

Intestinal parasitic infestations are a common finding in the developing world, however, the patterns of parasitic distribution and rates are different elsewhere. The prevalence of intestinal parasitic infestation and chemical analysis of stool sample of the school children of age group 4-12 years in Dadeldhura district, far western region of Nepal. Out of 530 stool samples, 165 (31.13%) were found to be intestinal parasites positive. Among the total parasites, *Hymenolepis nana* (46.56%) and *Giardia lamblia* (7.47%) were found in high prevalence as helminths and protozoa respectively. Among the total stool samples 159 (30%) showed positive occult blood test. The prevalence of parasitic infection was found high in the children of age group 4-6 years (38.18%) than others though the result was not significant statistically ( $P > 0.05$ ). Highest prevalence of parasites was found in those not following the hygienic conditions (36.17%) than those following (18.83%). Similarly, high proportion of the parasites were found in children having gastrointestinal symptoms (49.23%) than in children without the gastrointestinal symptoms (13.70%) though the result was not significant statistically ( $P > 0.05$ ). The study showed the children using the water directly from the source had higher prevalence of parasites (32.13%) than those using treated water (14.28%). This study presents the high prevalence of stool parasites in school going children of Dadeldhura district.

**Key words:** Parasitic infection, School children, Stool samples, Dadeldhura, Nepal.

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### INTRODUCTION

Intestinal parasitic infections are among the major problems of public health in developing countries. Approximately 3.5 billion people are infected by intestinal parasites and around 450 million children are ill due to these infections.<sup>1</sup> Intestinal parasitosis alone is one of the most common public health problems in all over Nepal.<sup>2, 3, 4</sup> The distribution and prevalence of the various intestinal parasites species depend on social, geographical, economical and inhabitant customs. Studies on human parasitic infections have demonstrated a common relationship between parasitic infections and lower socio-economic status of the region.<sup>5</sup> So periodic epidemiological studies and transmission dynamics in parasitic infections will provide more accurate understanding.<sup>6</sup>

*Ascaris lumbricoides*, *Trichuris trichiura* and Hookworms, collectively referred to as soil-transmitted helminths (STHs), are the most common intestinal parasites. *Ascaris lumbricoides* is the largest and the most common helminth parasitizing the human intestine. *Giardia lamblia* is the most prevalent protozoan parasite worldwide.<sup>7</sup>

It is estimated that soil transmitted helminthes (STH) alone

infect over one billion people in the world. Many of them were infected by more than one species of STH. It has been estimated that 65,000 deaths occur due to *Ascaris lumbricoides*, 60,000 due to hookworms and 70,000 due to *Trichuris trichiura* each year and STH mainly affect children leading to their poor growth, reduced physical activity, impaired cognitive function and learning ability. In Nepal, STH infection has remained as one of the significant health problems. The prevalence rate approaches nearly one hundred percent in some areas and been associated with anaemia and malnutrition. Even now intestinal helminthes infection ranks fourth in top-ten diseases in Nepal.<sup>1,8</sup> Present study was designed to study the prevalence of intestinal parasites among village school children of Dadeldhura district among village school children of rural place, Dadeldhura, far West region of Nepal.

### MATERIALS AND METHODS

The study was cross sectional study done amongst the school going children. The area of this study was from different villages of Dadeldhura district and the samples were processed in the Microbiology laboratory of Team Hospital, Dadeldhura. The study was conducted from December 2009

to March 2010. A total of 530 stools samples from children of various schools of Dadeldhura district were randomly collected. Children of age group 4-12 years were selected for study. The data was collected from the children using questionnaire on age, sex, water sources, personal hygiene habits and presence of gastrointestinal tract symptoms during the school hour at that very day. Children/attendance of children were requested to collect about 30 gms/30 ml of the stool sample avoiding contamination of urine, water and other substances in a container. Single specimen was collected from each individual. The samples were processed using standard methodology for the physical, chemical and microscopic examination of stool sample<sup>9</sup>. Data were analyzed by using Microsoft excel sheet and SPSS 11.5 version.

**RESULTS**

A total of 530 stool samples were examined macroscopically, out of total samples, 468 (88.30%) and 430 (81.10%) were normal in colour and consistency respectively. Mucous was present in 43 (8.10%) samples but none of the sample were seen to contain blood.

**Table 1: Physical properties of stool samples.**

Properties	Examination	Total (n)	%
Colour	Normal	468	88.30%
	Abnormal	62	11.70%
Consistency	Normal	430	81.10%
	Abnormal	100	18.90%
Blood	Presence	0	0%
	Absence	530	100%
Mucus	Presence	43	8.10%
	Absence	487	91.90%
Worms	<i>Ascaris lumbricoides</i> (Round worm)	5	0.90%
	Absence	525	99.10%

Of the total 530 stool samples, occult blood test was positive in 159. Out of total positive occult blood test, 93(58.49%) stool samples showed parasitic infection. Similarly, among the total negative occult blood test, 72(19.40%) stool sample showed parasitic infection. The result was not significant statistically (P>0.05).

**Table 2: Parasitic infection according to occult blood test.**

Occult blood test	Total (N)	Parasitic infection	p value (χ) <sup>2</sup>
Positive	159	93 (58.49%)	p<0.001
Negative	371	72 (19.40%)	
Total	530	165 (31.13%)	

Among a total of 530 stool samples, 165 samples (31.13%) were found parasites. The prevalence of parasitic infection in case of males was found to be 98 (30.40%) (Table 3). The result was not significant statistically (P>0.05).

**Table 3: Distribution of parasites in different genders.**

Gender	Total (N)	Positive (N)	p value (χ) <sup>2</sup>
Male	322	98 (30.40%)	p>0.05
Female	208	67 (32.20%)	
Total	530	165 (31.13%)	

Of the total 530 school children, the highest prevalence of parasitic infection was found in the children of age group 4-6 years, (42) 38.18% (Table 4) and result was not significant statistically (P>0.05).

**Table 4: Parasitic infections in different age groups.**

Age group	Total (n)	Positive (n)	p value (χ) <sup>2</sup>
4-6 years	110	42 (38.18%)	p>0.05
7-9 years	146	47 (32.19%)	
10-12 years	274	76 (27.73%)	
Total	530	165 (31.13%)	

The prevalent species were *Hymenolepis nana* 81 (46.56%), Hookworm 48 (27.58%), *Ascaris lumbricoides* 31 (17.82%), *Giardia lamblia* 13 (7.47%) and *Trichuris trichiura* 1 (0.57%).

**Table 5: Intestinal parasites detected among the school children.**

S.N.	Parasites detected	Total (N)/%
1	<i>Hymenolepis nana</i>	81 (46.56%)
2	Hookworm	48 (27.58%)
3	<i>Ascaris lumbricoides</i>	31 (17.82%)
4	<i>Giardia lamblia</i>	13 (7.47%)
5	<i>Trichuris trichiura</i>	1 (0.57%)
	Total	174 (100.0%)

**DISCUSSION**

The parasitic infection is a common cause of morbidity and mortality in paediatric population in tropical countries. The prevalence of intestinal parasites in children varies in different regions of the world. It is particularly high in poor and developing countries due to use of contaminated drinking water, inadequate sanitary conditions and poor personal hygiene.<sup>10</sup>

In this study, total of 530 stool sample 468(88.30%) samples were of normal, for the consistency of stool, 430(81.10%) were of normal consistency, blood were not seen in total stool sample, out of total sample, in 43(8.10%) stool sample mucus were present, for the presence of worms, out of total sample only in 5 (0.90%) stool sample, *Ascaris lumbricoides* were seen by macroscopic examination of stool sample. In this study 159 stool samples showed positive occult blood test. Of total positive occult blood test, 93 (58.49%) stool sample showed parasitic infection.

The present study demonstrated that positive test occult blood test during routine analysis was correlated with the intestinal parasitic infection. However, as test occult blood test is widely used in Nepal, more awareness for the public about importance of restricting some foods and drugs intake prior fecal occult blood test is needed and our result with occult blood test is consistent with the Wakid *et al.*,<sup>11</sup> In this study, the overall prevalence of intestinal parasites among village school children was 31.13%, which is consistent with the findings of Wadood *et al.*, and Tadesse.<sup>10,12</sup> The most common intestinal parasites identified in the present study was *H. nana* (46.56%) which is noteworthy, as reported such high rates of this cestode by Sharma *et al.*, Adhikari *et al.*, Shrestha *et al.*,<sup>13,14,15</sup> Higher prevalence of hymenolepiasis is reported by Wadood *et al.*, from Pakistan i.e. 34%, Martinez *et al.*, from Mexico i.e. 22.6%, and by Mirdha *et al.*, from India i.e. 9.9%.<sup>10,16,17</sup> *H. nana* prevalence noticeably decreased with increasing age. Therefore, it may be associated with the poor sanitation and low socio-economic status in the community. This high prevalence in present study may be due to faeco-oral route by ingesting of eggs from contaminate hands,

poor personal hygiene and poor environmental hygiene that contribute to result such high prevalence among the children. The prevalence of Hookworm was also very high (27.58), which are in accordance with reports from Chhakda *et al.*,<sup>18</sup> Higher prevalence of Hookworm infection is associated with personal hygiene and maternal education. In the present study, the prevalence of the parasites in children having gastrointestinal symptoms was 128(49.23%) and in children without the gastrointestinal symptoms were 37(13.70%). The result shows a significant association between gastrointestinal symptom and parasitic infection, which is very consistent with the findings of Adhikari *et al.*,<sup>14</sup>

## CONCLUSION

The present study reveals that the health status in this district of school going children was limited due to the relatively poor hygiene and sanitary conditions. Thus, prompt preventive measures should be taken for the eradication of high infestation, rate which should include public health education, safe water supply, improve sanitation and personal hygiene practices.

## ACKNOWLEDGEMENT

We would like to thank the members of Team Hospital Dadeldhura, for providing laboratory facilities in the hospital. We are also thankful to the school children of Dadeldhura district for providing stool samples and necessary information for this research work.

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