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SOIL TRANSMITTED HELMINTHIC INFESTATION IN CHILDREN OF KASHMIR VALLEY

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ABSTRACT
Worm infestation is a major problem in children from developing countries due to bad hygienic conditions. It produces nutritional deficiencies and anaemia in children when present in large numbers. The present study deals with the investigation of the frequency of intestinal helminth parasites in children of Kashmir valley in the age group of 4-15 years. 312 children were examined for different intestinal helminths in three schools located in rural areas of Kashmir valley. Negative cases were re-examined and if found free of intestinal helminthes were labelled as negative. Of the 312 children examined 222 (71.15%) tested positive for various intestinal helminths. The various helminth parasites found include *Ascaris lumbricoides, Trichuris trichiura, Enterobius vermicularis* and *Taenia saginata*. By for the highest frequency of 69.23% (216/312) was noted for *Ascaris lumricoides* followed by *Trichuris trichiura* 30.76% (96/312), *Enterobius vermicularis* 7.69% (24/312) and *Taenia saginata* 7.69% (24/312). Single infection was found in 33.65 %(105/312) where as mixed infection was seen in 37.5% (117/312) children. This study emphasizes the need for improved environmental hygiene i.e. clean water supplies, enhanced sanitation and chemotherapy of all school age children in all the rural areas.

KEY WORDS: Helminths, Kashmir valley, School children, Soil transmited infections

INTRODUCTION

Intestinal parasites remain major contributors to morbidity, especially in children in developing countries. Among the effects associated with these parasites are growth retardation, intestinal obstruction, hepatic and biliary diseases, impaired cognitive development and nutritional effects such as iron deficiency anaemia (Agbolade *et al.*, 2004). Helminthiasis, which is transmitted faecal-orally via poor sanitation and hygienic practices, has been shown to contribute to anaemia, stunted growth, underweight and poor school performance (Bundy *et al.*, 1988; De-Silva *et al.*, 1994). The survey on the prevalence of various intestinal helminth parasites in any region is a prerequisite to develop appropriate control strategies. Prevalence of intestinal helminths in Kashmir valley has not been reported till now; therefore the status of intestinal helminths and their contribution to morbidity has not been quantified. This report represents a pilot study undertaken to determine the prevalence of intestinal parasites among children in Kashmir valley.

MATERIALS AND METHODS

Kashmir valley is located in the northern side of Indian province and is about 1000 kms. away from Delhi. The occupation of people is mostly agriculture. This study was conducted in ten middle schools located in rural areas of this valley. Stool samples were collected from 312 children, which include 180(57.6%) males and 132(42.3%) females in the age group of 4-15 years. The importance of the study was explained to all children in the study population and the methods of collecting the stool specimens were thoroughly made clear to all the children. They were provided with labelled clean stool containers containing 10ml of 10% formalin with a proper lid. Every child was instructed to bring his/her own stool sample, so that no mixing occurs. After collection, specimens were immediately transported to parasitological laboratory I of P.G Department of Zoology, the University of Kashmir for further processes. Specimens were processed by using direct smear and Zinc sulphate floatation concentration techniques. All the parasitic eggs or worms recovered were recorded and descriptively analyzed. A difference in the prevalence between the genders was compared by using χ^2 test.

RESULTS

312 children between age of 4-15 years and includes both male (n=180) and female (n=132) were included in this study. The over all prevalence of helminth parasite infection was 71.15 %(222/312).

At least one intestinal helminth was detected in 33.65% (105/312) children and multiple helminth infestation was recorded in 37.5 %(117/312).The most common parasitic helminth was *Ascaris lumbricides* 69.23% (216/312) followed by *Trichuris trichiura* 30.76% (96/312). *Ascaris lumbricoides* was found as single type infection as well as in association with other helminths in mixed type infection. Mixed type infection include *Ascaris lumbricoides+Trichuris trichiura* 31.8%(69/222), *Ascaris lumbricoides+ Enterobious vermicularis* 8.1%(18/222), *Ascaris lumbricoides + Taenia saginata* 4.05%(9/222), *Ascaris lumbricoides+Trichuris trichura+Enterobius vermicularis* 2.7%(6/222), and *Ascaris lumbricoides+Trichuris trichiura+ Tenia saginata* 6.7%(15/222) (Table-1).

There was no significant difference in the prevalence of *Ascaris lumbricoides* and *Taenia saginata* between male and female children (P >0.05) but the prevalence of *Trichuris trichiura* and *Enterobius vermicularis* was significantly different in the two sexes (P<0.05). In this study, it was seen that male children are more infected (76.6%) than female children (63.6%) (P<0.05). Results showed that children in the age group of 8-11 are more infected (26.92%) followed by the 4-7 year age group (24.03%) and 12-15 year age group (20.19%).

Table-1. Prevalence of intestinal helminths among school children in Kashmir valley.

Helminth infection	Prevalence (%)	(n=312)
At least one helminth parasite	33.65%	(105/312)
Multiple helminth infection	37.5%	(117/312)
Ascaris lumbricoides	44.59%	(99/222)
Trichuris trichiura	2.70%	(6/222)
Ascaris lumbricoides+ Trichuris trichiura	31.8%	(69/222)
Ascaris lumbricoides+Enterobius vermicularis	8.1%	(18/222)
Ascaris lumbricoides+Taenia saginata	4.05%	(9/222)
Ascaris lumbricoides+ Trichuris trichiura+ Enterobius vermicularis	2.7%	(6/222)
Ascaris lumbricoides+ Trichuris trichiura+ Taenia saginata	6.7%	(15/222)

Table-2. Prevalence of individual parasites in the two sexes

Parasitic infection	Males (n=180)	Females (n=132)	Total
Ascaris lumbricoides	75% (135)	61% (81)	69.23% (216)
Trichuris trichiura	26.6% (48)	36.36% (48)	30.76% (96)
Enterobius vermicularis	13.3% (24)	0	7.69% (24)
Taenia saginata	8.33% (15)	6.81% (9)	7.69% (24)

Table-3 Prevalence with respect to age and sex

Males				Females			Overall +ive %age
Age group	No. Screened	+ive	%age	No. Screened	+ive	%age	
4-7	63	48	76	39	27	69.2	24.03
8-11	63	51	80.95	54	33	61.1	26.92
12-15	54	39	72.2	39	24	61.5	20.19
Overall	180	138	76.6	132	84	63.6	71.15

DISCUSSION

In the present study, frequency of intestinal helminth parasites was investigated. Results indicated a high prevalence of 77.15 % (222/312). Similar studies conducted in different developing countries have shown a high prevalence of intestinal helminthiasis. Studies conducted by Bundy *et al.,* (1988) in Malaysia Gupta, (2006), De-silva *et al.,* (1994) in Kandy area of Srilanka (Ibrahim, 2002). Rodriguez *et al*., (2002) in Maracaibo municipality of Venezuela (Lindo *et al.,* 2002), and Legesse and Erko (2004) in Lake Langano, Ethopia (Martin *et al.,* 1983) also showed the similar results in their studies.

It was found in the study that 33.65% (105/312) were infected by at least one helminth parasite and 37.5% (117/312) were infected by multiple helminth parasites. Lindo *et al*., (2002), in young children in the interior of Guyana (Mengistu Legesse and Berhanu Erko, 2004) and Legesse and Erko (2004) in the lake langano, Ethiopia (Martin *et al.,* 1983), have shown similar results in their studies.

The results of this study indicate that *Ascaris lumbricoides* was commonest helminth parasite in both male (75%) and female (61%) children, followed by *Trichuris trichiura* 26.6 % in male and 36.36% in female children.This may be due to the presence of the source of the infection in the area studied and frequent faecal-oral spread of infection among children. In addition, contamination of soil by human faeces (especially for *Ascaris* and *Trichuris*) in combination with a high degree of overcrowding and a low-income level increases the susceptibility to helminthiasis. Similar results were shown in their studies by Eiman *et al.,* (2004) in Kuwait (Ramdath *et al.,* 1995), and Lindo *et al*., (2004) in young children of interior Guyana (Mengistu Legesse and Berhanu Erko, 2004).

In the present study it was seen that *Enterobius vermicularis* was almost prevalent only in male children but *Taenia saginata* was found in both the sexes with least significant difference in the prevalence ($P<0.05$). Our results are in accordance with the results of study carried out by Martin *et al*., (1983) in the children of the northern Bangladesh (Singh *et al.,* 1984). Our results are in contrary to the results of the studies carried out by Bundy *et al*., (1988) in urban slum of Malaysia. Such differences can be due to some different habits of children in the two study sites. In the present study data analysis regarding prevalence of parasite in relation to sex is indicative of some sex linked difference in the pattern of prevalence. Data analysis reveals a higher percentage in males (76.6%) than females (63.6%) which is statistically significant ($P<0.05$).Similar results have been reported by Singh *et al*.,(1984) in rural community of Varanasi (Stephenson *et al.,* 2000). and Ibrahim (2002) among school children in Gaza strip , Palestine (WHO, 1987).
In the conclusion, the study shows that intestinal helminths are prevalent in high magnitude among school children of Kashmir valley. This calls for the institution of control measures, including treatment of infected individuals, improvement of sanitation and provision of clean water. The impact of each measure would be maximized through a health education programme directed to school children in particular and to communities in general.

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