Prevalence of parasitic infestation among school going children of South-Western Kashmir valley

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ABSTRACT

The present study was conducted to determine the prevalence of parasitic infestation and types of intestinal parasites in rural school going children of South-Western area of Kashmir Valley. It included students from the first standard to Class X. Among 130 participating childrens, 60 (46.15%) had the parasitic infestation. Out of 60 infected children (46.15%), school children were infected with different types of parasites (either protozoan, helminths or mixed). Among all infected children (n=60), single parasitic infection was detected in 52 (86.66%) children, while 8 (13.33%) children had the mixed infection. Among helminthic parasites, *Ascaris* was the most common (24%), followed by *Giardia* (7.5%), *Trichuris* (5%), *Taenia* (1.5%) and *E. histolytica* (1%). Gender-wise, there was a moderate statistical difference in prevalence of parasitic infection in all age groups. The present study suggests the need for proper health awareness program in schools along with regular screening for intestinal parasites and treatment for the effective management of the intestinal parasites.

Keywords: Prevalence, Parasitic Infection, School children, Kashmir

INTRODUCTION

Parasitic infestations (PI) caused by intestinal helminths and protozoan parasites are one of the most common infections in human populations of developing countries.[1] WHO has estimated about 3.5 billion people are affected by different types of parasites universally, and 450 million people develop certain symptoms as a result of these infections, with the most affected age group being children.[2] PI is one of the main public health problems in developing countries. School-aged children are very susceptible to PI, often carrying higher loads of parasites.[3] The reported prevalence of intestinal parasites varies from one place to another. Most common intestinal parasites reported from school going children in various regions of globe include *Ascaris lumbricoides, Giardia lambli, Trichuria, Taenia and E. histolytica* [4, 5 and 6].

Parasitism is associated with diverse clinical complications such as malnutrition, iron deficiency anemia, mal-absorption syndrome, intestinal obstruction, and mental and physical growth retardation.[7] In recent times various workers have worked on the parasitic infections in various parts of Kashmir valley [4, 5 and 6]. The present study was conducted to determine the prevalence of PI and types of intestinal parasites in rural school children of Kashmir valley.

MATERIALS AND METHODS

The present study was conducted from July 2010 to December 2010 at a rural Government run school located in the South-Western part of the Kashmir Valley. Students from the first standard I to Class X were included in the study. Consent was taken from the school authority prior to the commencement of the study. One day prior to sampling, school children were distributed with a properly labeled sterilized, dry, rubber cork provided glass container and a plastic spatula. The method of stool collection was explained to the students from Class IV to Class X. Parents of students from Class I to Class III, were given an information leaflet mentioning the purpose of the study and instruction on the method of collection of the stool sample. Clusters of samples were collected, emulsified in 10% formalin solution and transported to Microbiology Department of SKIMS Medical College. Formol-ether concentration technique, which is considered to be the most appropriate method for examination of intestinal parasites, was done for examination of the stool samples. Students detected with intestinal parasites were informed. Demographic data collected during the study was verified from the school records. The study population was divided into six classes of social status as per the Kuppaswamy social scale. Chi-square test was used to analyze the differences of proportions.

RESULTS

During the present study total, 130 stool samples were examined, of which 71 (54.62%) were males and 59 (45.38%) females. The age group of examined population ranged between 5-16 years. Further, the studied population was subdivided into three different age groups. The social and demographic characteristics of studied population were also taken into consideration.

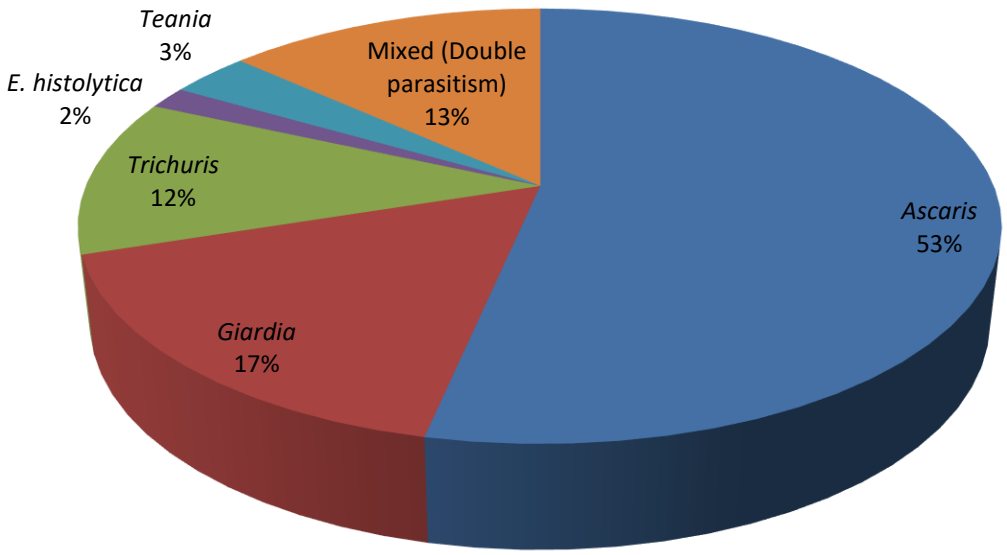
Out of 130 samples examined, 60 (46.15%) school children were infected with different types of parasites (either protozoa, helminths or mixed). Among all infected children (n=60), single parasitic infection was detected in 52 (86.66%) children, while 8 (13.33%) children had the mixed infection.

Five different species of parasites; 2 protozoan and 3 helminth species were detected. Among helminths, *Ascaris* was the most common (53.33%) followed *Trichuris* (11.66%). Among protozoan parasites, *Giardia* was the most common (16.66%) followed by *Entamoeba histolytica* (1.66%). Mixed infections of *Ascaris lumbricoides* with the protozoan parasite (*Giardia lamblia*) were detected in eight children (Table-1, Fig. 1).

Table-2: Prevalence and distribution of intestinal parasites

S. No.	Parasite	No. of positive cases	Percentage
1.	*Ascaris*	32	53.33%
2.	*Giardia*	10	16.66%
3.	*Trichuris*	7	11.66%
4.	*E. histolytica*	1	1.66%
5.	*Teania*	2	3.33%
6.	Mixed (Double parasitism)	8	13.33%
7.	Overall positive	60	46.15%
8.	Overall negative	70	53.84%

Fig. 1: percentage-wise prevalence and distribution of intestinal parasites in study population



The prevalence of PI in relation to age group and sex is given in (Fig. 2). The prevalence of PI among males was 58.33% which was higher compared to that of females (41.66%), but this PI was highest among children aged 9-13 years (81.25%) followed by children aged 5-9 years (68.29%) and children aged 13-16 years (36.51%) (Fig. 3).

Fig. 2: Sex-wise prevalance of intestinal parasites in study population

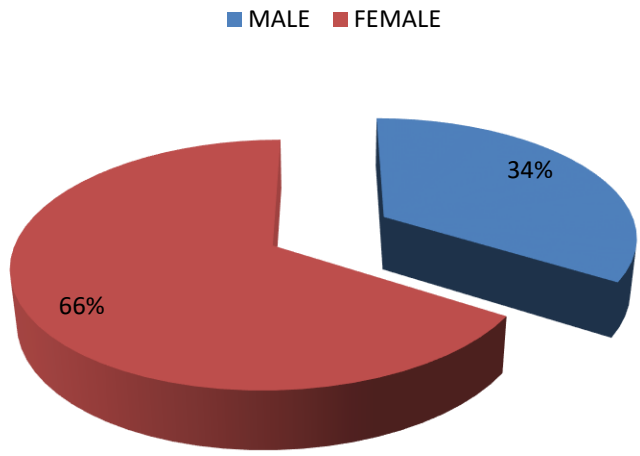
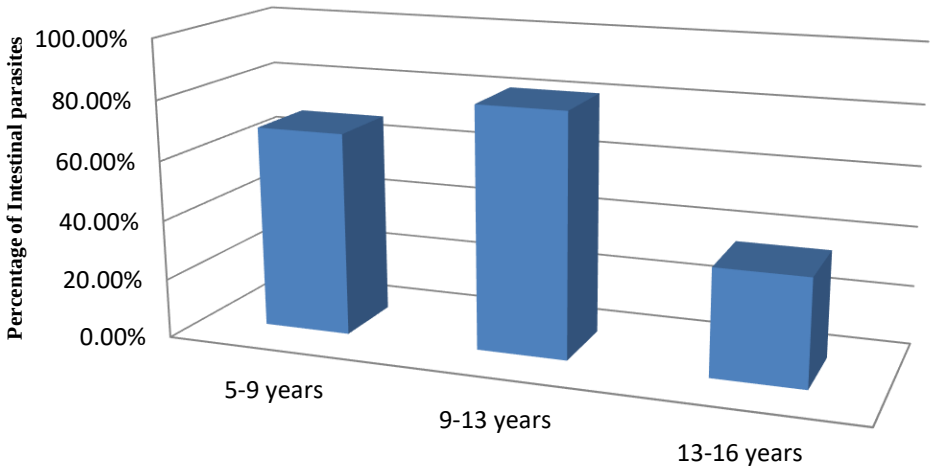
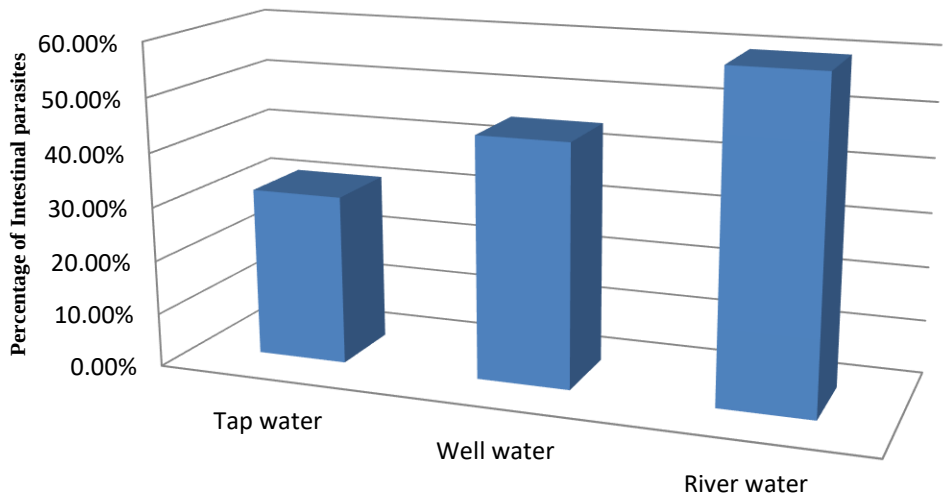


Fig. 3: age groupwise prevalnce of intestinal parasites in study population



In present study various demographic and social parameters were put under consideration like the source of drinking water (Tap, well and river water). After analysis, the prevalence of PI was observed higher among children drinking river water (59.61%), followed by children drinking well water (44.18%) and children drinking tap water (31.42%), (Fig. 4).

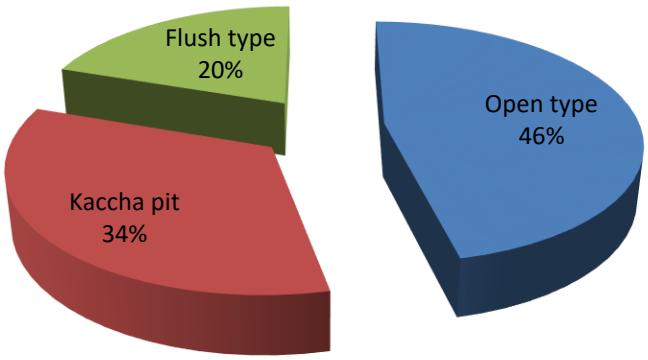
Fig. 4: prevalnce of intestinal parasites on the basis of source of drinking water in study population



In the present study, social parameters like type of latrine were put into consideration (open type, Kacha/Pit, and Flush type). Prevalence of PI was observed higher among children defecating in open type latrine

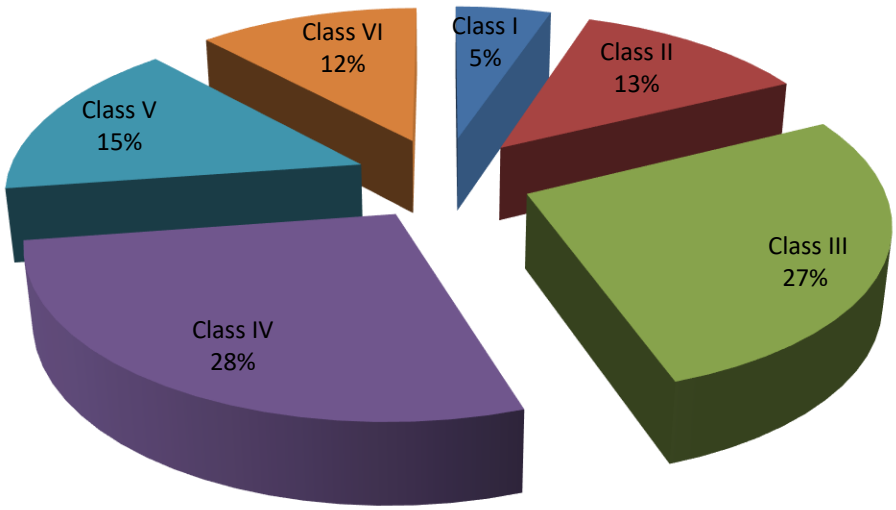
(67.85%), followed by Kaccha/Pit (49.12%) and flush type (28.88%), (Fig. 5).

Fig. 5: percentage prevalence of parasitic infestations on the basis of type of laterine facilties available to study population



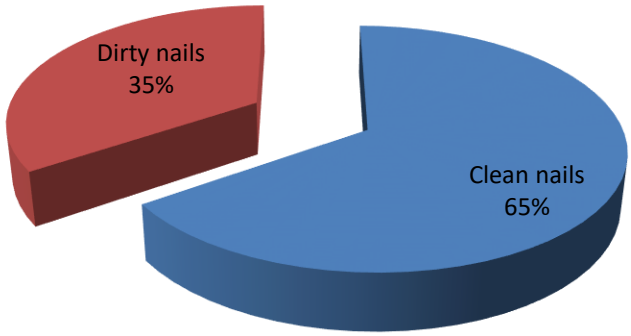
In the present study, a significant correlation was observed between PI and socioeconomic status of the analyzed population, the Kuppaswany social scale was used to stratify the study population into six main classes based on the score as per Performa completed on education, occupation, and per capita income. The class first was the highest socioeconomic group where class VI was the lowest group. Applying the Kuppaswany social scale to 130 children, 15 were categorized in class I, 40 class II, 27 class III, 25 class IV, 10 class V and 13 class VI. Prevalence of PI was observed higher among class IV (72%) followed by class III (70.33%), class V (40%), class II (32.5%), class VI (30.76%) and class I (13.33%), (Fig. 6).

Fig. 6: percentage prevalence of intestinal parasites in six different classes of study population using Kuppaswany socio-economical scale for study population



In current study personal hygiene was also taken into consideration wherein nail hygiene was one objective parameter assessed. Out of 130 children, 75 had clean/trimmed nails, whereas 55 had dirty/untrimmed nails. The prevalence was high in dirty/untrimmed nails (65.45%) and low in clean/ trimmed nails (32%) (Fig. 6).

Fig.6: prevalance of intestinal parasites in study population based on health hygiene of study population



DISCUSSION

In this study, 46.15% school children were infected with different types of parasites. Among all infected children (60), single parasitic infection was detected in 86.66% children, while 8 13.33% children had the mixed infection. Similar are the findings of studies [3, 12]. Among helminths, *Ascaris* was the most common (53.33%), followed *Trichuris* (11.66%). Among protozoan parasites, *Giardia* was the most common (16.66%) followed by *Entamoeba histolytica* (1.66%). Mixed infections of *Ascaris lumbricoides* with the protozoan parasite (*Giardia lamblia*) were found, as was previously done by the works of [4, 5, 6, 7, 8 and 9].

Ascaris lumbricoides and *Trichuris trichiura* are the commonest intestinal helminths in school children Kashmir valley, as also found by studies of different workers at different locations [4, 5, 6, 10, 11 and 12].

Prevalence of intestinal parasites was found slightly higher among boys. Similar findings have been reported by various studies [11, 12 and 13]. Another study has shown the significantly lower prevalence of parasitic infection in girls attributing it to their good hygiene compared to boys [6]. Age wise prevalence of IPI was found to be highest among children of age below 9 years followed by children of age ranging from 5-9 years, which were significantly higher than that of children of aged 13 years and above. Further, pairwise comparison revealed the statistically significant lower prevalence of IPI among children above 13 years than children aged less than 5 years and 5-9 years. The decrease in the prevalence of IP with the increase in age of children has been reported in other studies as well, in which they have attributed this finding to rise of awareness regarding hygienic practices [4, 5 and 6].

The present study fails to explain the relationship between socioeconomic status and prevalence and intensity of infection and this may be possible because of smaller sample size. When Risk factors associated with parasitic infestation included open defecation, an unhygienic source of drinking water, untrimmed nails and hand hygiene after defecation. The prevalence of intestinal helminths was significantly higher among children with untrimmed nails [4, 5 and 6].

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