



PREVALENCE OF INTESTINAL PARASITIC INFESTATION AND ITS ASSOCIATED RISK FACTOR IN RURAL AREAS CHILDREN OF VARANASI DISTRICT, UTTAR PRADESH

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ABSTRACT

Intestinal parasitic infection is a major cause of morbidity among young children in India, due to low socioeconomic status and poor personal hygiene practices. Intestinal parasitic infestations are majorly challenged by the rural areas school children of Varanasi district. Considering the fact, the current study was conducted among rural areas school children from 06-16 years of age, with an aim to know the prevalence of Intestinal worm infestation. The study was conducted on 246 school children's fecal specimens. The collected specimens were examined with the Saline wet mount and Iodine wet mount method. Out of the total studied subjects, the prevalence of Intestinal worm infestation was found to be 17%. In our study, Protozoan infections are 8% commonly found followed by Helminthic infection (*Ascaris lumbricoides* 4%, Hookworm 3%, *H. nana* 2%), in the study participants. Worm infestation association was found to be statistically significant and to rule out the status of nutrition and hygiene practices. Anemia is a major health issue in children of growing age in our country which causes high morbidity and mortality rate. Besides this helminthic infection in children is also a common problem due to unhygienic habitat. Hence the policy of iron and folic acid supplementation and the anti-helminthic drug should be administered globally as recommended by WHO may be practically enforced besides health and hygiene education.

KEYWORDS : *Ascaris lumbricoides*, *H. Nana*, Parasitosis, Prevalence, Infestation

INTRODUCTION

Globally Intestinal worm infestation is a major health problem, which shows a maximum and serious medical illness in the low economic and middle-income countries with a high prevalence rate in many regions. The majority of children are high in prevalence as compared to the rest of the age group people. Most of the health issues like physical and mental (growth retardation), iron deficiency anemia (due to intestinal bleeding), as well as other symptoms, upsurges the rate of morbidity and mortality [1]. Protein-energy malnutrition, cognitive deficit, loss of appetite, diarrhea is also caused by intestinal parasitic infection. *Ascaris lumbricoides* (20%), hookworm (18%), *Trichuris trichiura* (10%), and *Entamoeba histolytica* (10%) *Giardia lamblia* (10-20%) generally, in developing countries as well as worldwide, these are the most common intestinal parasites which cause infection [2]. The intestinal parasite rapidly multiplies its colony inside the host intestine and passed through the feces. The places where their open-air defecation practices contaminate the soil. Fecally contaminated soil, polluted drinking water, poor personal hygiene, and sanitation are the major cause of parasitic transmission [3]. The constant growths of population, urbanization and industrialization, poor socio-economic conditions, indigenous food habits, and traveling to various geographical regions have led to the acquaintance of food-borne parasitic infections [4]. In India, the prevalence rate of worm infestation ranges from 12.5% to 66% with the dependency from region to region. [5-8]

Due to the high prevalence rate and severe adverse events of helminthic and protozoan infection in children. For combating the disease there is no effective immunization or vaccine for intestinal parasitic infestation. Thus the present study is an effort to estimate the prevalence of intestinal parasitic infestation in rural area school children of Varanasi district, Uttar Pradesh, India.

MATERIAL AND METHODS

Study cohort

A total of 246 rural area school children of Kashi-Vidyapeeth

block, Varanasi, UP, India from 6-16 years age group were selected. The sample size was calculated according to our study design [9]. The selection of study subjects was based on the single-stage cluster sampling method. Written informed consents were obtained from the parent/guardian and head of the school authorities. The study protocols and techniques were approved by the institutional human ethical committee of Banaras Hindu University, Varanasi.

Inclusion Criteria

- Children from ages 6-16 years were included in the study.

Exclusion Criteria

- Not willing to participate/ give written consent.
- Having any history of medical illness.

Exclusion criteria were based on the relevant information from the parents/guardians and with the complete physical examination.

Data Collection Method:

After obtaining the list of rural areas schools of Kashi-Vidyapeeth block in Varanasi district, Uttar Pradesh, randomly a school was selected and approval has been taken from school authorities for the medical camp. The aim of the study was explained to the study participants and their parents/guardians. Written informed assent was obtained from each participant for willingness to participate in the medical health camp. Data for this study was filled in a pre-prepared case-sheet proforma containing signs and symptoms of worm infestation (Krimi Roga), anthropometry, family history, drug history, diet, and personal hygiene.

A sterile wide-mouth screw-capped container was given to each participant for the collection of stool samples. For observation of intestinal parasitic infection Saline wet mount and iodine wet mount method was followed and microscopic examination was done.

Statistical Analysis

The data which were collected all are filled in master sheet

and then analyzed by using SPSS statistical tool version 20. The prevalence of intestinal worm infestation and demographic profile of the study participants were analyzed using Descriptive statistics, Chi square test were done for statistical significance.

RESULT AND OBSERVATION

Two hundred forty-six school children of rural areas were screened for intestinal worm infestation. All the participants were interrogated for the socio-demographic profile and distributed accordingly age wise, as per dietary habits, socioeconomic status, footwear habits, and defecation practices.

Table 1: Demographic profile of the study participants (n=246)

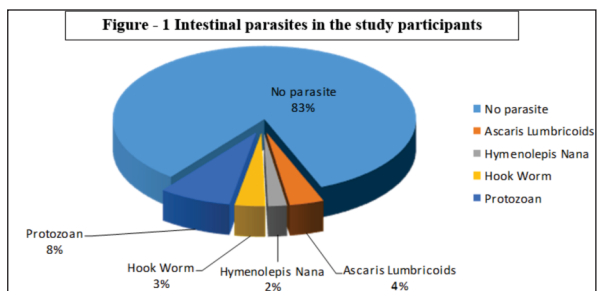
Profile	Frequency	Percentage %	
Age Group	6 – 10 years	20	08.1
	11 – 13 years	147	59.8
	14 – 16 years	79	32.1
Diet	Veg	68	27.6
	Mixed	178	72.4
SES (Kuppuswamy's scale)	Lower middle	43	17.5
	Upper lower	166	67.5
	Lower	37	15.0
Footwear habit	Regularly	54	22
	Occasionally	192	78
Defecation practice	Open field	47	19.1
	Lavatory	199	80.9

As per Table-1, the total participants from age 6-16 years were distributed in three groups 6-10 years(Group-I), 11-13 years(Group-II), and 14-16 years(Group-III), it was found that 59.8% of participants were in Group-II followed by group-III 32.1% and the group-I 8.1%. Further, in respect of diet, 72.4% of study participants were having mixed diet patterns (occasionally having non-vegetarian food in their daily life) and 27.6% were pure vegetarian. According to Kuppuswamy's scale, the socioeconomic status of the studied subject was lower-middle, upper-lower, and lower class with 17.5%, 67.5%, and 15.0% respectively. Habits of wearing footwear regularly were found only in (22%) whereas (78%) participants most of the time forgot to wear footwear. Out of the total participants (80.9%) were using the lavatory (sanitary toilet) at their home for defecation practice, while (19.1%) were still using the open ground for defecation practices.

Table 2: Prevalence of intestinal worm infestation in school children (n=246)

Worm infestation	Male n=92		Female n=154		Total n=246	
	No.	%	No.	%	No.	%
Present	15	16	26	17	41	17
Absent	77	84	128	83	205	83
Total	92	100	154	100	246	100

As per Table 2, a total of two hundred forty-six stool samples were examined out of which 41 participants were having intestinal parasitic infestation with a prevalence rate of 17%. Out of the total male participants, 16% were suffered from intestinal worm infestation and 84% are normal whereas in female subjects 17% are infected with intestinal worm infestation and 83% are normal.



In the total studied participants, protozoan infection was commonly found by helminthic infection. 8% of participants are infected with protozoan infection, while 3% were infected with hookworm, 2% with Hymenolepis Nana, and 4% with Ascaris lumbricoides Fig. 1

Table-3 Prevalence of worm infestation with related factor (n=246)

Factors	Frequency	Infestation	Prevalence (%)
Age Group	6 – 10 years	09	45
	11 – 13 years	26	17.6
	14 – 16 years	06	7.5
Diet	Vegetarian	12	17.6
	Mixed	29	16.2
SES (Kuppuswamy's scale)	Lower middle	02	4.6
	Upper lower	22	13
	Lower	17	45.9
Footwear habit	Regularly	06	11.1
	Occasionally	35	18.2
Defecation practice	Open field	28	59.5
	Lavatory	13	6.5

It was observed that out of 41 positive samples for parasitic infection, the highest Parasitosis (45%) was seen in the 6-10 years age group when compared with 11-13 years (17.6%) and 14-16 (7.5%) years age group. It was also found that pure vegetarian diet participants were more prone (17.6%) to intestinal infestation as compared to the mixed diet patterns participants (16.2%). As per Kuppuswamy's Scale of socioeconomic status in our study, the highest prevalence of Parasitosis (45.6%) was seen in lower economic status participants as compared to upper-lower (13%) and lower-middle (4.6%). The children with the irregular habit of footwear were higher in prevalence (18.2%) in comparison to the children having regular footwear habits (11.1%). Children having open field defecation practices were more infected with worm infestation (59.5%) as compared to the children having sanitary toilets (6.5%) at their homes Table-3.

DISCUSSION

In developing countries, the highest prevalence of intestinal parasitic infestation was recorded, when it is present in school-going children the associated risk factors develop comorbidity which tends to malnutrition and suppresses academic performance. This study was conducted among rural area school children, to find out the prevalence of intestinal parasitic infestation in school-children with associated demographic factors.

The prevalence of intestinal worm infestation in this study was lower than a similar study reported in India by Gopalakrishnan [10], Kumar [11], Khanal [12], but comparatively higher than a report from Kotien [13], Misra [14]. Various study shows the prevalence rate in India ranges from 12.5% to 66% [16-19]. The variation in the prevalence was seen due to innumerable geographical regions, differences in the sources of contagious, and heterogeneity in the sociodemographic characteristics.

On microscopic examination of stool samples, it was found that protozoan infections are the most common intestinal parasite (8%), followed by A. lumbricoides (4%), Hookworm (3%), and H. nana (2%) in the study participants which is in agreement with the studies done by Sitotaw et al, Ethiopia [20], Ashtiani et al Iran [21]. In our study area, the protozoan infection is common it is well established that Parasitosis is closely related to improper hygienic habits, intake of contaminated food materials, and drinking water.

This study shows that the prevalence was higher in the participants who were mostly barefoot (18.2%) in comparison

to those having regular footwear habits (11.1%). A similar study was done in Nepal by Sah et al [22] and in Kolkata by Dutta et al [23], which showed that barefoot habits are significantly higher in the prevalence rate of Parasitosis.

The prevalence of parasitic infestation was significantly higher in the participants using open areas in comparison to using the sanitary toilet for defecation practice. Similarly, a study was conducted by Ashok et al Andhra Pradesh [24] where prevalence was higher in open area defecation practices are followed.

CONCLUSION

On the basis of present study, intestinal worm infestation is a major health problem among rural school children of the Varanasi district. Low economic status, poor sanitation, and unhygienic practices were the main determinants of making this population susceptible to intestinal parasites. Improving hygiene, restricting outdoor defecation, provisions of sanitary toilets for all, hygiene and health education are the necessary steps to prevent these infections. In addition, the population is easily accessible for treatment so it is highly recommended to enforce an anti-helminthic program for school children.

Acknowledgement

The authors would like to acknowledge all the technical staff of the Department of Microbiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi for technical support during data collection and laboratory examination. We also extend our thanks to all the participants for their cooperation during specimen collection.

Funding There is no funding for publication of this manuscript

Conflict Of Interest

The authors declare no conflict of interest.

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