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Research Article

PREVALENCE OF INTESTINAL PARASITIC INFESTATIONS IN PATIENTS ATTENDING A TERTIARY CARE HOSPITAL OF CENTRAL INDIA

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ABSTRACT

Objectives: The objectives of the study were to find out the prevalence and spectrum of intestinal parasitic infestations among the patients attending the associated hospital with complaints of abdominal pain and diarrhea.

Methods: A total of 117 stool samples were collected and screened for intestinal parasitic infection. Plastic containers with identification numbers were given to the patients, and information regarding name, age, sex, ward, and findings of stool routine microscopy were recorded. All samples were examined macroscopically for appearance, color, and the presence of blood and mucus and then analyzed using direct microscopy for the presence of intestinal parasites.

Results: It was found that intestinal parasitic infections were mainly attributed to *Entamoeba histolytica*, *Ascaris lumbricoides*, and *Giardia lamblia.*

Conclusion: It was found that intestinal parasitic infections were mainly attributed to *E. histolytica*, *A. lumbricoides*, and *G. lamblia* which are pretty prevalent in the region of the study.

Keywords: Prevalence, Parasitic infestation, Stool examination, *Entamoeba histolytica*, *Giardia lamblia*, *Ascaris lumbricoides*.

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INTRODUCTION

Intestinal parasitic infestations are the most prevalent disease in the world, predominantly in the developing countries. It is estimated that more than 2 billion people are affected globally, mostly in tropical and subtropical parts of the world. The prevalence of parasitic infestations is directly related to the level of sanitation and is found to be higher in the tropics and subtropics than in temperate regions [1-3].

Apart from the sanitation levels, other factors such as poverty, malnutrition, population density, water quality, health status, and a lack of hygiene determine the growth and transmission of intestinal parasites. The prevalence rate of intestinal parasitic infection is ranging from 14.6% to 91% in different studies, conducted in various parts of the country [1]. The parasitic infestations commonly prevalent globally are attributed to *Ascaris lumbricoides*, *Ancylostoma duodenale/Necator americanus*, *Trichuris trichiura*, *Enterobius vermicularis*, *Entamoeba histolytica,* and *Giardia lamblia* [1-7].

E. histolytica is found to affect around 480 million people globally with prevalence rates ranging from 5% to 81% [2,4].

G. lamblia has been reported as the most common intestinal parasite in the US, whereas *A. lumbricoides* (47.0%) in China [8,9].

In the developing countries like India, intestinal parasitic infestations are considered a major health issue. There is a growing need for epidemiologic surveys regarding such infestations as this reflects the sanitary status of a community and is the source of requisite data required for formulating strategies for the control of such infections in near future. Various community-based surveys conducted in India have shown a wide range (11.50–97.40%) of prevalence rates [3,6,10-18].

Considering the scarcity of available information on the prevalence of parasitic infections in Madhya Pradesh, a state in Central India, we performed the present community-based study in the urban slums of a city located in Madhya Pradesh, India. The study's goals were to identify the prevalence and spectrum of intestinal parasitic infestations among the patients attending the OPDs of a tertiary care hospital in Central India, with abdominal complaints.

METHODS

This cross-sectional study was conducted in the Department of Microbiology, Government Medical College and Associated Hospital, Datia, with prior permission from the Institutional Ethics Committee. A total of 117 stool samples were collected and screened for intestinal parasitic infection. Plastic containers with identification numbers were given to the children. Information regarding name, age, sex, ward/section, and findings of stool examination were recorded.

All samples were examined macroscopically for the appearance, color, and presence of blood and mucus and then examined using direct microscopy for the presence of intestinal parasites. The freshly collected stool samples were used to prepare saline wet mount and iodine mount to be examined under the microscope. Saline wet mount and iodine mount were prepared by adding small quantity of the stool to 1–2 drops of normal saline and Lugol's iodine on the slide respectively with a wooden stick and covered with a cover glass. The stool was examined for ova/eggs, cysts and trophozoites within 12 h by direct wet mount examination.

Statistical analysis

All data was maintained in Microsoft Office Excel and tests of proportions were used for analysis.

RESULTS

Among a total of 117 stool samples, 78 samples were collected from males and 39 from females. All these persons were suffering

Table 1: Pattern of stool examination findings among the study subjects

S. No.	Stool examination findings	Adult (above 18 years)		Children (05–18 years)		Infants and children (01–05 years)	
		Male	Female	Male	Female	Male	Female
1.	*Ascaris lumbricoides* fertilized decorticated eggs	01	--	--	--	--	--
2.	*Entamoeba histolytica* cysts	02	--	--	--	05	03
3.	*Giardia lamblia* trophozoites	--	--	--	01	01	--
4.	*Giardia lamblia* cyst	--	--	02	--	01	01
5.	*Entamoeba coli* cyst	--	--	--	--	01	02
6.	Fat globules	--	--	--	--	08	01

Table 2: Pattern of clinical symptoms among study subjects

S. No.	Symptoms*	Number	Prevalence (%)
1.	Blood in stool	12	34
2.	Vomiting	17	48
3.	Fever	23	46
4.	Tenesmus	08	22

*All the interviewed patients were having abdominal pain and diarrhea. $p<0.05$

from abdominal pain and diarrhea. Among these, 35 were reported positive for parasitic infections. The prominent parasitic pathogens observed and reported were *E. histolytica* followed by *G. lamblia*. *A. lumbricoides* eggs were also reported in few samples. The pattern of stool examination findings and clinical manifestations among the study subjects is depicted in Tables 1 and 2.

DISCUSSION

Intestinal parasitic infections is a public health problem worldwide, particularly in the developing countries. The prevalence of GI parasitic infection depends on various socioeconomic factors such as hygiene, availability of clean drinking water, and poverty. Major health problems in many developing countries, are predominantly due to poor sanitation and inadequate personal hygiene [8].

In our study, the prevalence of intestinal parasite came out to be 29.91% out of which male has a higher prevalence around 74%, and females have a 26% prevalence rate involving all age groups.

In some similar studies, Bansal *et al.* [9] and Khurana *et al*. [11] reported a prevalence ranging from 14.6% to 19.3%. Fernandez *et al*. [12] reported a maximum of 91% of prevalence in school-going children in a rural setting in and around Chennai, while Wani *et al.* [13] reported 46.7% prevalence of intestinal parasitic infection among school children in Srinagar city.

In another study conducted in rural as well as urban areas of Kashmir, the prevalence of intestinal parasites was as high as 71.2% [13].

Sehgal *et al*. [15] reported a prevalence rate of 42.8% in a low socioeconomic area from Chandigarh. Studies from other countries, namely, the Philippines, Cambodia, and Turkey have reported a higher prevalence of intestinal parasites among school children [13-17].

The most common parasitic infection in this study was *E. histolytica* followed by *G. lamblia* and *A. lumbricoides*. This is in line with other studies conducted by Awasthi *et al*. [17], Fernandez *et al*. [12], and Wani *et al*. [13].

Wani *et al*. [13], Sehgal *et al*. [15], and Chandrashekhar *et al*. [16] reported cysts of *G. lamblia* and *Entamoeba histolytica* as the most common stool examination finding among school children.

Other developing regions, such as Iran, North Lebanon, Brazil, Nepal, Malaysia, and Saudi Arabia, have reported prevalence values ranging from 19.3% to 70%. Several studies conducted in the recent past for estimating the prevalence of intestinal parasitosis in rural and urban India have reported the prevalence rate varying from 11.50% to 97.4% [7,17]. A significant variation was observed in the prevalence rate reported by these studies due to a number of factors such as timing and duration of study, age of subjects, dietary habits, occupation, geographical factors, sampling methods, and research techniques.

In a majority of the studies, including the present study, the parasite infection rates were based on the examination of a single stool specimen per individual. However, the expenses incurred for conducting extensive studies must be weighed against the expected advantages in terms of sensitivity. The studies involving collection of multiple samples from study subjects may be difficult due to resource constraints and higher withdrawal rate of the study subjects.

CONCLUSION

The result of this study indicates that intestinal parasitic infections among school-going children are a common health problem. Helminthic infestation, as well as protozoal infestation, is commonly found in school-going children in India. Poor sanitary conditions, lack of clean drinking water supply, and education are supposed to play important role in establishing intestinal parasitic infections. This advocates the use of various deworming schedules periodically in schools to cure the children and to break the transmission chain of these intestinal parasitic illnesses along with a supply of clean drinking water.

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AUTHORS' CONTRIBUTIONS

Concept, design, and intellectual content are attributed to Dr. Abha and Dr. Abhishek. Literature search and data acquisition were done by Dr. Abha and Dr. Ashish. Data analysis and interpretation were done by Dr. Ashish. The manuscript was prepared by Dr. Abha and Dr. Ashish. Manuscript editing and review done by Dr. Abhishek. All authors approved the final version of the manuscript.

CONFLICTS OF INTEREST

None.

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ETHICAL CLEARANCE

Ethics approval was sought from the Institutional Ethics Committee before conducting the research.

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