



# INTESTINAL PARASITE INFECTIONS; IDENTIFICATION, FREQUENCY AND ASSOCIATED FACTORS WITH INTESTINAL PARASITE INFECTIONS IN PATIENTS WITH GASTROINTESTINAL DISORDERS

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**ABSTRACT... Background:** Worldwide, intestinal parasitic infections are major cause of human mortality and morbidity especially among developing countries wherein public health standards are not much better like developed countries. Intestinal parasitic infections are linked with poor sanitation, lack of safe drinking water, inadequate dietary and cultural habits and climate conditions. **Objective:** To assess the frequency, risk factors and clinical manifestations related to intestinal parasite infections in patients with gastrointestinal disorders. **Study Design:** Cross-sectional multi-centre study. **Setting:** Department of Medicines, Chandka Medical College Larkana and Civil Hospital, Khairpur Mirs. **Period:** 1<sup>st</sup> January 2017 to 31<sup>st</sup> December 2017. **Method:** 260 patients, the patients with gastrointestinal disorders presenting one or more symptoms (e.g. diarrhea, dysentery, abdominal pain, nausea and vomiting, cramping and constipation) were included. **Results:** Frequency of intestinal parasites was 32.3%. The most common parasites were Entamoeba histolytica (10.4%), Giardia lamblia (8.5%) and Hymenolepis nana (6.9%). Age, education, monthly income and contact with animal were significantly associated with intestinal parasite infections. Concerning symptoms, the presence of intestinal parasites infection was significantly associated with diarrhea and dysentery. **Conclusion:** Study concluded that most prevalent parasites were Entamoeba histolytica, Giardia lamblia and Hymenolepis nana. Significant association was found in age, education and monthly income.

**Key words:** Frequency, Gastrointestinal disorders, Helminths, Intestinal parasite.

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## INTRODUCTION

Parasite infection is most common among developing countries throughout the world.<sup>1</sup> It is one of the leading global health issues and upto 3.5 billion individuals were infected while about 450 million were ill caused by intestinal parasites.<sup>2</sup> Intestinal parasites affect all age groups people but the children are more vulnerable to these infections.<sup>3</sup>

Several surveys have reported the incidence of parasite infections, for developing countries it ranged from 11 percent through 14 percent to 82 percent with direct figures of 35.39 percent and 81 percent. For industrialized states, reported incidence was between 7.3 to 23 percent.<sup>4</sup> Numerous studied carried out in different part of Pakistan like Karachi, Lahore,

Skurdu, Abbottabad, Bagh and Neelum valley demonstrated the prevalence of 68.8%, 23.8%, 54.91%, 81% 21.75% and 18.02% respectively.<sup>5,6</sup>

Infections due to intestinal protozoan and helminths parasites are most common among people living in developing states. In industrialized states, protozoan parasites more frequently cause the gastrointestinal infections as compared to helminths. The intestinal parasites lead to a considerable mortality and morbidity in endemic states.<sup>7</sup>

Helminths worms have several cells. Tapeworms (cestodes), flatworms (trematodes) and roundworms (nematodes) are included in most widespread helminths that reside in human gut. Mostly, the helminths are not able to multiply

in human body. Parasites like Protozoan that have just one cell are able to multiply inside human body. Four genus of intestinal helminthic parasites are also recognized like soil-transmitted helminths and geohelminths: Roundworm (*Ascaris lumbricoides*), whipworm (*Trichiuris trichiuria*), hookworms (*Necator americanus*) and *Ancylostoma duodenale*.<sup>7</sup> Above 1.5 billion individuals or 24 percent of the global population is infected with soil-transmitted helminth infections globally.<sup>8</sup>

The most prevalent intestinal protozoan parasites include: *Giardia intestinalis*, *Cyclospora cayentanensis*, *Entamoeba histolytica* and *Cryptosporidium* spp. Diseases owing to such intestinal protozoan parasites are recognized like giardiasis, cryptosporidiosis, amoebiasis and cyclosporiasis respectively, and are related to diarrhea. *G. intestinalis* is most common parasite and cause of diarrhea among developed countries and this infectivity is more common in the developing states, as well. Amoebiasis is a third significant cause of mortality due to parasitic diseases globally, with its significant impact on population living in developing countries.<sup>7</sup>

Intestinal parasite infections can lead to severe gastrointestinal disorders and these organisms play a significant role in most widespread infectious diseases.<sup>9</sup> Gastrointestinal disorders are referred to the diseases associated with gastrointestinal tract for example the ones compromising the stomach, rectum, large and small intestines. They are linked with various symptoms like diarrhea, nausea and vomiting, stomach/abdominal pain, weight loss, bloating, indigestion/dyspepsia and constipation. It was demonstrated that intestinal parasites have an elevated prevalence among patients with gastrointestinal disorders and are associated with above described symptoms.<sup>10</sup>

Among developing countries, raised intestinal parasitic infections were reported due to poverty, shortage of safe drinking water, low literacy rate, malnutrition, humid and hot tropical climate and poor hygiene.<sup>11</sup> The infected persons could have complete impairment during survival, cognitive performance, dietary status and educational

achievement.<sup>12</sup>

For the control and prevention of these communicable diseases, provision of fundamental sanitation infrastructure, together with education and promotion in the hygiene behavior and targeted drug management proved effective.<sup>13</sup>

Intestinal parasite infections are greatly prevalent in Pakistan with erratic distribution in various areas of country. Several surveys have been carried out in different parts of Pakistan, no such type of research was undertaken regarding frequency, risk factors and clinical manifestations related to intestinal parasite infections in patients with gastrointestinal disorders. Hence, present study aims to know the frequency, risk factors and clinical manifestations related to intestinal parasite infections in patients with gastrointestinal disorders in Larkana and Khairpur Mirs.

## MATERIAL AND METHODS

This cross-sectional multi-centre study was conducted at Department of Medicines, Chandka Medical College Larkana and Civil Hospital, Khairpur Mirs from 1<sup>st</sup> January 2017 to 31<sup>st</sup> December 2017. Total 260 patients of both genders and all age groups were included in the study. Study population was the patients with gastrointestinal disorders presenting one or more symptoms (e.g. diarrhea, dysentery, abdominal pain, nausea and vomiting, cramping and constipation). Stool samples were collected in the disposable plastic bags and examined within 1 hour after the collection. Stool smears were tested under light microscope with direct saline smear and lugol's iodine solution. Identification of parasitic was confirmed through formalin ethyl acetate concentration technique. The data was entered in SPSS-20 and analyzed. Chi-square test was used to find out the association between parasites infection and risk factors. P-value  $\leq 0.05$  was considered as significant. Confidentiality of the data was ensured and proper consent was obtained before data collection.

## RESULTS

Among 260 patients, 84 (32.3%) patients have intestinal parasites and 176 (67.7%) have no

intestinal parasites (Fig. 1). Among 84 patients of intestinal parasites, 27 (10.4%) had entamoeba histolytica parasite, 3 (1.1%) patients had entamoeba coli, 22 (8.5%) Giardia lamblia, 3 (1.1%) ascarislumb ricoides, 2 (0.8%) iodamoeba butchii, 18 (6.9%) hymenolepis nana, 1 (0.4%) taenia species, 7 (2.7%) had blastocystis hominis and 1 (0.4%) patient had trichuristric hura (Table I).

Out of the total participants, 136 were males while 124 were females. Intestinal parasitic infections (IPI) were more common in males (33.8%) than females (30.6%). The positive participants belong to different grades of literacy. It was found that 36.7% were matric pass while 38.2% were high school going. The majority of effectees (positive) were students (33.8%). However 33.7% of housewives were also found positive for intestinal parasitic infections. Out of the total participants, 136 participants used untreated water supply within these (33.1%) were effected by intestinal parasitic infections (positive cases). Hand washing habit was not see in 31.7% of positive participants (Table II).

The most common symptoms associated with IPI were frequent abdominal pain in 31.2% positive cases. Another major complain was diarrhea, which was noticed in 37.6% of positive IPI participants. Bloating was also complained by most of the participants suffering from IPI in 32.4% (Table III).

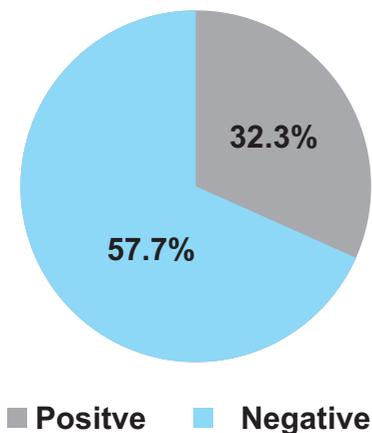


Fig-1. Frequency of intestinal parasites

Parasites	Frequency	%age
Entamoeba histolytica	27	10.4
Entamoeba coli	3	1.1
Giardia lamblia	22	8.5
Ascarislumb ricoides	3	1.1
Iodamoeba butchii	2	0.8
Hymenolepis nana	18	6.9
Taenia species	1	0.4
Blastocystis hominis	7	2.7
Trichuristric hura	1	0.4
Total	84	32.3

Table-I. Frequency of intestinal parasites patients with gastrointestinal disorders

Variables	No.	Positive	Negative	P-value
<b>Abdominal pain</b>				
Yes	196	64 (32.7%)	132 (67.3%)	0.41
No	64	20 (31.2%)	44 (68.8%)	
<b>Nausea or vomiting</b>				
Yes	12	4 (33.3%)	8 (66.7%)	0.24
No	248	80 (32.3%)	168 (67.7%)	
<b>Stomach pain</b>				
Yes	104	33 (31.7%)	71 (68.3%)	0.74
No	156	51 (32.7%)	105 (67.3%)	
<b>Bloating</b>				
Yes	34	11 (32.4%)	23 (67.6%)	1.00
No	226	73 (32.3%)	153 (67.7%)	
<b>Diarrhea</b>				
Yes	117	44 (37.6%)	73 (62.4%)	0.01
No	143	40 (28.0%)	103 (72.0%)	
<b>Dysentery</b>				
Yes	8	4 (50.0%)	4 (50.0%)	0.05
No	252	80 (31.7%)	172 (68.3%)	
<b>Constipation</b>				
Yes	12	2 (16.7%)	10 (83.3%)	0.01
No	248	82 (33.1%)	166 (66.9%)	

Table-II. Symptoms associated with intestinal parasites among patients with gastrointestinal disorders

**DISCUSSION**

Parasites infection is more common in developing states and a major health issue. Present study was undertaken to assess the frequency, risk factors and clinical manifestations related to intestinal parasite infections in patients with gastrointestinal disorders. To obtain appropriate results, 260 patients were included. After stool examination, study showed that frequency of intestinal parasite was 32.3%. The results of our study are better than the study conducted in Karachi by Siddiqui and teammates<sup>5</sup> who reported that frequency of intestinal parasites was 68.8%. In the present

study most prevalent parasites were Entamoeba histolytica, Giardia lamblia and Hymenolepis nana while Siddiqui and teammates<sup>5</sup> asserted that most common intestinal parasites were Giardia lamblia, Entamoeba histolytica and Ascaris lumbricoides. Another study carried out in Lahore by Ghani and coworkers<sup>6</sup> exhibited better scenario that intestinal parasites frequency was only 21.0% and Enterobius vermicularis, Giardia lamblia and Entamoeba histolytica were the most common parasites. This study further indicated that most effected group was more than 50 years old and male patients. But the study undertaken by Mehraj and colleagues<sup>15</sup> highlighted that female patients were in majority.

Education is most significant factor and plays a considerable role in preventing people from numerous health issues. It is important to mention intestinal parasite infection was more prevalent among illiterate/under matric patients than those matric and above. A similar study done by Kiani and associates<sup>10</sup> also confirmed that parasite infection was more prevalent among illiterate/under matric patients.

Role of safe drinking water cannot be underestimated; study demonstrated that intestinal parasite infection was high among patients who used untreated water. The findings of our study are comparable with a recent study performed by dos Tyoalumun and fellows<sup>16</sup> who also confirmed that intestinal parasite infection was more prevalent among patients who used untreated water. Like safe drinking water, hand washing before meal also prevent people from several infections but study showed different situation that patients who washed their hands before meal had more frequency. Another study carried out by Hailegebriel<sup>2</sup> also asserted that intestinal parasite infections was found more among patients who washed their hand before taking meal.

When associated symptoms were assessed, study disclosed that majority of the patients with intestinal parasite infections had abdominal pain, nausea or vomiting, blotting, diarrhea and dysentery. Kiani and associates<sup>10</sup> also showed similar results that most of the patients had abdominal pain, nausea or vomiting, diarrhea and dysentery.

**CONCLUSION**

The frequency of intestinal parasite was 32.3% with Entameoba histolytia was identified as a frequent intestinal parasite.

**Recommendation**

Availability of safe drinking water and health department intervention can prevent population from such infections.

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Variables	No.	Positive	Negative	P value
<b>Age (years)</b>				
≤25	95	36 (37.9%)	59 (62.1%)	0.01
26-50	105	24 (22.9%)	81 (77.1%)	
>50	60	24 (40.0%)	36 (60.0%)	
<b>Gender</b>				
Male	136	46 (33.8%)	90 (66.2%)	0.16
Female	124	38 (30.6%)	86 (69.4%)	
<b>Education</b>				
Illiterate	80	17 (21.3%)	63 (78.7%)	0.02
Primary	28	11 (39.3%)	17 (60.7%)	
Middle	58	21 (36.2%)	37 (63.8%)	
Matric	60	22 (36.7%)	38 (63.3%)	
> Matric	34	13 (38.2%)	21 (61.8%)	
<b>Occupation</b>				
Govt. job	20	7 (35.0%)	13 (65.0%)	0.79
Pvt. Job	56	14 (25.0%)	42 (75.0%)	
Business	21	8 (38.1%)	13 (61.9%)	
Housewife	95	32 (33.7%)	63 (66.3%)	
Student	68	23 (33.8%)	45 (66.2%)	
<b>Monthly income (Rs.)</b>				
≤ 20,000	152	56 (36.8%)	96(63.2%)	0.00
>20,000	108	28 (25.9%)	80 (74.1%)	
<b>Drinking water</b>				
Treated	124	39 (31.5%)	85 (68.5%)	0.58
Untreated	136	45 (33.1%)	91 (66.9%)	
<b>Hand washing before meal</b>				
Yes	137	45 (32.8%)	92 (67.2%)	0.47
No	123	39 (31.7%)	84 (68.3%)	
<b>Contact with animal</b>				
Yes	97	35 (36.1%)	62 (63.9%)	0.03
No	163	49 (30.1%)	114 (69.9%)	
<p><b>Table-III. Risk factors associated with intestinal parasites among patients with gastrointestinal disorders</b></p>				

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Imdad Ali Ansari	Concept of the project & data analysis.	
2	Jawed Akhtar Samo	Collect the materials & data.	
3	M. Aslam Soomro	Review of the article.	