

# Study of Intestinal Parasites in Patients attending a Tertiary Care Hospital in Western U.P., India

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**Abstract:** Background: Intestinal parasitic infestation is major public health problem in the world. Parasitic infections can lead to a number of adverse effects like anaemia, reduced physical growth, mental retardation, abdominal colic, cholestasis, pancreatitis and cholecystitis. This study was undertaken to assess the prevalence of intestinal parasitic infections among patients, attending S.M.M.H Medical college, Saharanpur.(U.P). Materials and Methods: The study was conducted from January 2016 to February 2017 in the Department of Microbiology, S.M.M.H Medical College and Hospital, Saharanpur(U.P). The study was conducted on 788 consecutive stool samples, received from patients attending the OPD and IPD of the Hospital with gastrointestinal symptoms. Conclusion: Helminthes are more common than Protozoa in our study. It is necessary to develop effective prevention and control strategies including health education and environmental hygiene to decrease prevalence of intestinal parasite.

**Keywords:** Intestinal parasites, Protozoa, Helminths

## 1. Introduction

Intestinal parasitic infections are one of the major health problems in several developing countries, including India<sup>[1]</sup>. According to the World Health Organization (WHO), more than one billion (almost 15-20%) of the world's population is suffering with parasitic infection<sup>[2]</sup>. In India, the overall prevalence rate ranges from 12.5% to 66%<sup>[3,4]</sup>. The prevalence of different intestinal parasites varies from one country to another and depends upon environmental, social and economical factors such as poverty, malnutrition, personal and community hygiene, population density, unavailability of drinking water, poor sanitary facilities and hot and humid tropical climate<sup>[5,6]</sup>. Intestinal parasitic infections are more common in children and leads to nutritional deficiency, anemia, growth retardation and impaired learning ability<sup>[1]</sup>. One of the major drawbacks in the fight against the parasitic disease is the inability to prevent them by immunization as no effective vaccine is available. Thus, the present study aimed to evaluate the incidence and prevalence of intestinal parasitic infection in the general population in and around Saharanpur.

## 2. Materials and Methods

The study was carried out in Microbiology laboratory of S.M.M.H Medical College, Saharanpur. Total 788 Stool samples were collected from patients suggestive of parasitic infections. Sample was collected in wide mouthed sterile screw capped, labelled containers without preservative. All fecal samples were subjected to routine macroscopic and microscopic examination. Macroscopic examination included colour, consistency, pH, presence of mucus, pus, blood and parasite. For microscopic examination, saline wet mount and Lugol's iodine wet mount was prepared and observed under low (10x) and high (40x) power. Formal-Ether concentration technique was performed in those cases which were negative by saline preparation method but had

strong clinical suspicion of intestinal parasitism<sup>[7]</sup>.

## 3. Results

A total of 788 stool samples were examined out of which 284 revealed presence of parasites with a prevalence rate of 36%. Protozoan infection was found in (15.35%) cases, while Helminthic infection in (20.68%) cases. Among positive samples *Entamoeba histolytica* was found to be the most common parasite (8.1%) cases, followed by *Giardia lamblia* (7.3%), *Ancylostoma duodenale* (6.9%), *Ascaris lumbricoides* (5.7%), *Hymenolepis nana* 22 (2.8%) cases and *Taenia spp* (5.2%) (Table 1, Figure 1). It was noted that parasitosis was seen more in male patients (37.19 %) when compared to females (34.4 %). In our study rural population was more affected (46.53 %) than urban population (27.28 %) as mentioned in the Table 2. In different age groups 11-20 years group (44.8%) was most commonly affected followed by 31-40 years (42.34%), 41-50 years (37.97%), 21-30years (36.92%), 51-60 years (31.94%), < 10 years (29.36%) and > 60 years (22.64%).

**Table 1:** Prevalence of various parasites in positive cases

Name of parasites	N (%)
<i>E.histolytica</i>	64(8.1)
<i>G.lambia</i>	57(7.3)
<i>A. lumbricoides</i>	45(5.7)
<i>A.duodenale</i>	55(6.9)
<i>Hymenolepis nana</i>	22(2.8)
<i>Taenia spp</i>	41(5.2)
TOTAL	284(36.0)

**Table 2:** Distribution based on gender and residence

Sex	Positive (%)	Negative(%)	Total
Male	170 (36.72)	293(63.28)	463
Female	114 (35.08)	211(64.92)	325
Total	284	504	788
Residence			
Urban	123 (27.82)	319(72.18)	442
Rural	161 (46.53)	185(53.47)	346
Total	284	504	788

**Table 3:** Total positive cases in various age groups

Age group (Years)	Number of Samples	Positive (%)
<10	126	37 (29.36)
11-20	154	69 (44.8)
21-30	111	48 (43.24)
31-40	130	47 (36.15)
41-50	66	25 (37.87)
51-60	144	46 (31.94)
>60	53	12 (22.64)

#### 4. Discussion

In the present study parasitic infection was seen in 284(36%) patients out of the total 788 cases, which is comparable to previous studies by Ragnathan et al., (34.56%), Prakash et al., (38.1%) and Aher et al., (30.4%)<sup>[4,8,9]</sup>. The prevalence rate of *Entamoeba histolytica* in our study is (8.1%) comparable to study done by Khanna, and Gupta (11.38%)<sup>[10]</sup>. *Entamoeba histolytica* are environmental contaminants of the water supply and transmitted orally by drinking contaminated water. The higher infection with this

parasites may be attributed to poor sewage system in the community, and the fecal contamination of water. Most common helminths infestation seen in our study was *Ancylostoma* (6.9%) followed by *A. lumbricoides* (5.7%), *Taenia spp* (5.2%) and *Hymenolepis nana* (2.8%). Prevalance of hookworm infection can be attributed to walking barefoot in the fields as the infection results from penetration of the skin by filariform larva<sup>[11]</sup>.

Male patients were more commonly affected (36.72%) compared to their female counterparts (35.08%) (Table 2), comparable to previous studies by Shrihari et al.,<sup>[12]</sup>. This can be explained by more outdoor activities by male compared to females. This is in contrast with the observations made by Chang et al.,<sup>[13]</sup>, who observed that gastrointestinal disorders were more common in females as compared to males. Halder et al.,<sup>[14]</sup> too in their study reported that gastrointestinal disorders observed the preponderance of females (52%) over males (48%). It is noted that parasitic infestation more common in rural area with prevalence rate (46.53%) in comparison to urban area (27.82 %) (Table 2). This can be attributed to poor sanitation, illiteracy and lack of personal hygiene along with poverty in rural area<sup>[15,16]</sup>. In our study (5.2 %) cases of intestinal taeniasis has been found which is comparable with the previous study done by Shrihari et al.,<sup>[12]</sup>. It is probably due to mixed diet and consumption of under cooked pork and beef by the population. Most common affected age group was 11-20 years with (44.8 %) of cases (Table 3), comparable to study done by Jad et al.,<sup>[17]</sup>.

**Table 4:** Prevalence of potentially pathogenic parasites reported between 2010 – 2016 from India

Year and Author	Place of study	Sample size		E. histolytica	G. lamblia	A. lumbricoides	H. nana	A. duodenale	Taenia spp
		N	Percentage +ve						
<b>2010</b> Ragnathan et al. <sup>[4]</sup>	Puducherry	1172	34.56	-----	7	43.21	7.66	28.89	----
<b>2011</b> Aher and Kulkarni. <sup>[9]</sup> Rashid et al. <sup>[18]</sup>	Ahmednagar	624	30.4	3.9	13.5	1.9	4.5	0.9	-----
	Bareilly	320	22.81	2.5	6.25	9.68	2.18	-----	-----
<b>2012</b> Bisht et al. <sup>[19]</sup> Panda et al. <sup>[20]</sup>	Gaziabadh	335	38	55.3	40.4	-----	24.2	3.12	----
	Bangalore	124	55.65	37.3	37.3	24.2	11.6	8.7	----
<b>2013</b> Kotian et al. <sup>[21]</sup>	Srinagar, UK	327	11.62	0.92	3.06	1.53	2.14	2.75	----
<b>2014</b> Sahai et al. <sup>[22]</sup>	Lucknow	755	17.6	9.3	3	1.3	0.3	0.4	----
<b>2015</b> Taiyaba et al. <sup>[23]</sup>	Lucknow	502	19.32	9.163	2.988	2.191	0.398	0.597	----
<b>2016</b> Present study	Saharanpur	788	36	8.1	7.2	5.2	5.7	2.8	6.9

#### 5. Conclusion

The occurrence of intestinal parasitic infections is quite high and intestinal helminthes are common than protozoa in our study. For the control of intestinal parasitic infections, health education should be given to population to make them aware about personal hygiene, sanitation, consumption of safe drinking water, avoidance of bare foot walking on soil, proper cooking of food and periodic deworming programmes.

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