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Prevalence of Intestinal Parasitic Infection in Patients Attending Tertiary Care Hospitals of Patna, Bihar

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Abstract: Intestinal parasitic infections are considered as neglected tropical diseases. About one third of the world population is infected with Intestinal parasite. Majority of the IPI cases found in developing world due to poor sanitation. IPI manifests as diarroea, dysentery, nausea, vomiting and abdominal pain. In this one year cross-sectional observational study 838 stool samples from clinically suspected patients were collected, which were evaluated physically and microscopically for the presence of ova, cysts, trophozoites, larvae or any body segments of parasites by using concentration method (Formol-ether). About 6% stool samples were found to be positive for intestinal parasites. Out of the total IPIs 56.5% had protozoal infection and 43.5% had helminthic infections. Among isolated parasites most common was Giardia lamblia (33%) followed by E. histolytica (23.5%), H. Nana (19.5%), Hookworm (16%) and *A.lumbricoides* (8%). High incidence of IPIs was found in age group of 16-45 years, which might be due to less use of deworming agent by adults. Since parasitic infection can lead to malabsorption, severe diarroea, paralytic ileus, intestinal obstruction, cholecystitis, appendicitis as well as pulmonary complications, prevention and control is necessary.
Keywords: Intestinal parasite, Infection, Protozoa, Helminth, Bihar.

INTRODUCTION

Intestinal parasitic infections (IPI) are considered as neglected tropical diseases. It is one of the major health problems globally. About 3.5 billion people are got infections and around 450 million people are ill due to intestinal parasites [1].

About one third of the world is infected with intestinal parasites [2].The majority of these intestinal parasitic infections are concentrated in developing countries. The problems are more serious in Sub-Saharan Africa, Asia and Latin America associated with inadequate water supply, poor environmental sanitation, fast population growth, and other economic and social problems [3]**.** Infestations of these parasites are commonly found in tropical and subtropical areas. The major factors are faecal contamination of water and food, hot and humid climate and environmental and socio-cultural factors like hygiene and age enhancing parasitic transmission [4]. Different clinical manifestations of IPIs are diarrhea, nausea, abdominal pain; dysetery etc.The incidence and prevalence of the intestinal parasitic infections vary from region to region. It also depends on the diagnostic methods employed and the number of stool samples examined [5]. These parasites reside in the gastrointestinal tract in humans and other animals. In urbanized countries, protozoan parasites commonly cause IPI in contrast to helminths [3]. The most common parasitic infections reported globally are *A. lumbricoides* (20%), *A. duodenale* (18%), *T. trichiura* (10%) and *E. histolytica* (10%) [2]. The intestinal parasitic infections are acquired by ingestion, inhalation, penetration of intact skin by infective stage of parasites and the high incidence is closely correlated to low socioeconomic status and poor environmental hygiene of affected persons. These factors directly contribute to the frequency of IPIs [6]. The prevalence of infection varies with different states of India [7].

MATERIALS AND METHODS

This was institution based study of one year period (November 2017 – October 2018), carried out in

Parasitology section of Department of Microbiology, IGIMS, Sheikhpura, Patna. Patna is the capital of Bihar state, situated on the bank of river Ganges in south Bihar. A total of 838 randomly selected and clinically suspected cases of intestinal parasitic infections, irrespective of age groups and sexes, from in and out – patient departments of IGIMS Patna were studied. Demographic data including name, age and address along with treatment history was noted. Patients under recent anti-helminthic treatment were excluded from the study group.

Specimen processing

A single, early morning fresh stool sample (10-50 g) was collected from each patient in a clean, wide-mouthed container. After noting down the macroscopic features (colour, consistency, odour etc), the stool specimen was processed using formol-ether concentration technique and examined microscopically for ova, cysts, trophozoites, larvae or anybody segments of parasites, using normal saline and Lugol's iodine mounts.

RESULTS

A total of 838 patients with clinical suspicion of intestinal parasitic infections were included in the study. Among which male patients 578 (69%) were more common than the females, 260 (31%) [Fig-I]. Maximum numbers of patients were in the age group of 16-30 years (295) followed by 31-45 years age group (249) [Table-I, Fig-II]. Total 51 parasites were isolated from 51 positive patients. Maximum number of parasites,16 (31.4%) were isolated from patients in the 16-30 years age group, followed by 13 (25.5%) parasites isolated from patients in 31-45 years age group. Among the isolated parasites *Giardia lamblia* (33%) were most common, followed by *E.histolytica* (23.5%), *H.nana* (19.5%), *Hookworm* (16%) and *A. lumbricoides* (8%) [Table-II, Fig- III].

Table-I: Age and sex wise distribution of study population

	0-15 years	16-30 years	31-45 years	46-60 years	>60 years	Total
Male	73	207	158	97	43	578
Female	24	88	91	44	13	260
Total	97	295	249	141	56	838

Table-II: Distribution of different parasites in different age group

	0-15 years	16-30 years	31-45 years	46-60 years	>60 years	Total
H.nana	3	3	2	1	1	10(19.5%)
Giardia	4	6	3	2	2	17(33%)
E.histolytica	0	3	4	2	3	12(23.5%)
Ascaris lumbricoides	1	2	1	0	0	4(8%)
Hookworm	2	2	3	1	0	8(16%)
Total	10	16	13	6	6	51(100%)

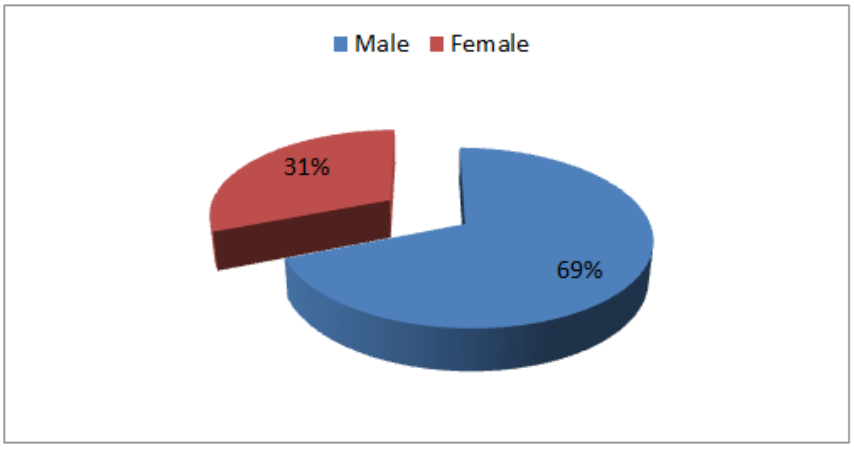

Fig-I: showing sex wise distribution of study population

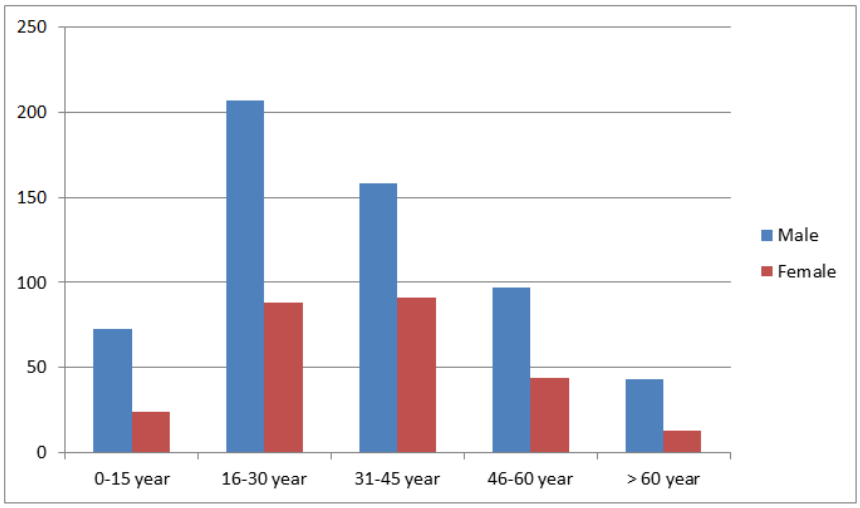

Fig-II: Age and sex wise distribution of study population

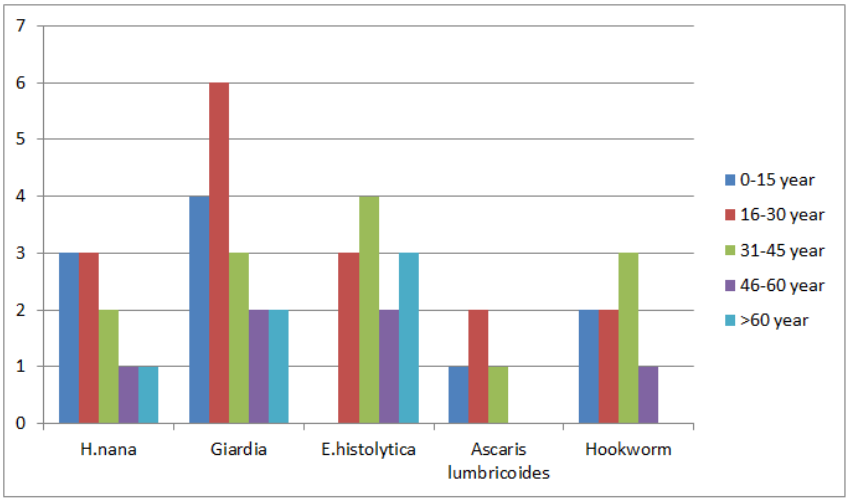

Fig-III: Distribution of different parasites in different age group

DISCUSSION

Microscopic Stool examination for parasitic ova, cysts, trophozoites and larvae still remains the gold standard for laboratory diagnosis for intestinal parasitic infections (IPIs). It is very important to have knowledge about prevalence of parasitic infection in particular geographic area, which may help prevention of misdiagnosis of IPI's as appendicitis and other inflammatory bowel diseases [7, 8].

In this study only 51 cases were found positive out of suspected 838 cases of intestinal parasitic infections, thus the prevalence rate in this study was 6% in clinically suspected individuals.Various studies from rural and urban regions have shown different prevalence rates ranging from 5.56% to 46.7% [9, 10]. Ideally three early morning stool samples should be examined but in this study only one sample from each patient was examined which might be the cause of decreased isolation percentage.

In this study protozoal parasitic infection were more common (56.5%) than helminthic infection (43.5%). Among protozoal infections in this study, Giardia (33%) exceeds over Entamoeba (23.5%) infection. Among the helminthic isolates, the prevalence of *H. nana was* 19.5%, followed by hookworm 16% and *Ascaris* 8%. A study from Rajasthan by Saurabh K *et al*. also shows higher incidence of protozoal infections as compared to helminthic infections and higher preponderance of H. nana infection among helminthes [11].

Few studies such as, one from Surat, Gujrat and other from Rohtak, Haryana showed prevalence rate less than ten percent. This might be due to improved sanitary practices, reduced slum areas, personnel hygiene, increased awareness, health education, extreme seasonal variations and geographical area [9,12].

One study done by a group of researchers in JIPMER, Puducherry included 1508 samples in 5 years,

whereas we had a total of 838 cases in a span of 1 year [13]. Giardia (33%) emerged as the commonest intestinal parasite in our study, while in a study from Puducherry, Entamoeba were the commonest intestinal parasite (39.7%) which was also not consistent with other studies [14,15]. In our study the next common parasite was Entamoeba (23.5%), whereas *Blastocystis hominis* was next common parasite in study from south. In this study we did not find any *Blastocystis hominis.*

The global ranking of soil transmitted helminths (STH) by WHO states *Ascaris* to be the most frequent parasite followed by hookworm and *T. trichiura*. We could not isolate any *T. Trichiura* in this study. The prevalence of hookworm was grossly decreased in the present study, similar to another study from Bihar [16]. The incidence was significantly greater in the Puducherry study (8.7%) as also a study by Parija and Rao where it was 10.5% [17]. This decrease could be attributed due to greater use of footwear among farmers and labourers and also due to commendable use of sanitary latrines in villages and among people of poor socioeconomic community.

CONCLUSION

In this study we found more positive cases in age group of 16-45 years of age, it may be due to less prescription of deworming agent in this age group. In age group of 1-15 years less positive cases were reported, which may be due to prescription of deworming agent in this age group by physician or may be due to frequent distribution of these agent in schools by Government of India. Since parasitic infection can lead to malabsorption, severe diarroea, paralytic ileus, intestinal obstruction, cholecystitis, appendicitis as well as pulmonary complications; prevention and control is necessary to decrease the morbidity and financial burden on patients.

Here in this study, single stool samples from each patient were examined and modified ZN staining was also not performed. The three stool examination and modified ZN staining could have diagnosed additional cases of IPIs.This study being a hospital based study, can not determine the true burden of parasitic infections in the community, for which more studies at community and village levels are needed with larger sample size.

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