

Burden of intestinal parasitic infection in patients attending tertiary care hospital in rural Haryana: A three year retrospective study

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ABSTRACT

Introduction: Intestinal parasitic infections is a serious public health problem in most of the regions of the world, especially in developing countries, and represents a major cause of morbidity and mortality in children and among high-risk groups.

Materials & Methods: In this retrospective study we have analyzed the results of stool samples received in Department of Microbiology over a period of three years i.e. from January 2013 to December 2015. Available clinical details were noted. Data so obtained was analyzed.

Results: Out of the total 2136 samples prevalence of intestinal infections was 17.5%. Protozoal cysts or trophozoites were detected in 89.0% and Helminthes were detected in 17.9% positive samples. *Giardia lamblia* was the most common protozoa and *Hymenolepis nana* was the most common helminth found. Parasitosis was seen more in female (18.9%) than male (16.5%). In our study, 89.5% samples had single parasite, 8.8% had two parasites and 1.6% samples contained 3 or more parasites. Diarrhoea/loose motions, abdominal discomfort/pain and anemia were some of the most common clinical symptoms of patients in the study followed by loss of weight and pruritus.

Conclusion: Intestinal parasitic infection is a major problem in our area. No such study has been conducted from Mewat till date. Findings of this study will help in formulating prevention strategies in this particular region in addition to adding to the existing literature.

Keywords: Intestinal infection, Parasites, Public health problem, Helminthes, protozoa, stool specimen

INTRODUCTION

Intestinal parasitic infection is endemic worldwide, and it represents a large and serious medical health problem in the developing countries with high prevalence rate in many regions. It is estimated that 3.5 billion people are affected, and 450 million are ill as a result of these infections, the majority being children. These infections cause morbidity and mortality

along with other manifestations like iron deficiency anemia, growth retardation in children and other physical and health problems¹. Helminthic infection is also related to protein energy malnutrition, low pregnancy weight and intra uterine weight loss². Most of these are transmitted through soil, there route of transmission being faecally contaminated fingers or sometimes migrate through skin to intestine³.

Parasitic infections cause detrimental effects on the physical growth of the general population and leads to poor cognitive performance in children⁴. It manifests with asymptomatic carrier state,⁵ gastrointestinal symptoms, or surgical problems^{6,7}. Symptoms presented by the patients usually depend on the host immune system, the degree of malnutrition, and environmental load⁸.

Therefore, it is essential to know the burden of intestinal parasitic infections in the Indian community. The data on their prevalence help the clinicians in the diagnosis and management of the patients. Our retrospective study, will thereby report a detailed analysis of the prevalence of potentially pathogenic intestinal parasites among the various patients visiting a tertiary care hospital located in rural North India.

MATERIALS AND METHODS

The present retrospective study was carried out in the Department of Microbiology of a teaching tertiary care hospital located in rural Haryana. The study protocol was approved by the institutional ethical committee. The study was conducted to determine the prevalence of intestinal parasitic infections among the suspected patients. The parasitic distribution was also evaluated according to sex and age of the patients. Stool sample of the out patients and admitted patients suspected of parasitic infections were included in the study. The 3 year (Jan 2013-Dec 2015) data were retrospectively analyzed. A total of 2136 fresh stool samples collected in a labelled, screw-capped, plastic, wide mouth containers were subjected to macroscopic (for naked-eye examination of color, consistency, proglottids of Tapeworms, presence of adult worms), and microscopic (for cysts and trophozoites of protozoa and ova of

helminthes) examination by saline and Lugol’s iodine preparation examined under 100x and 400x magnifications. Modified acid fast staining was performed for detecting coccidian parasites. Processing of specimen was done within 1-2 hours of collection. Protozoa and helminthes were identified according to morphological details. Non pathogenic cysts were not included as positives. Repeat sample from same patients were not included in study.

RESULTS

A total of 2136 samples were received during the study period. Out of these 373(17.5%) were positive for one or more than one parasite. Sex distribution of the samples is shown in Table.1; sex ratio being 2.1:1. It was noted that parasitosis was seen more in female patients (18.5%) when compared to males (16.9%). Over three years the prevalence has seen a steady rise (from 15.7%- 18.1%) as shown in Figure 1.

Table 1: Sex distribution of total and positive samples

	Total	Positive
Males	1455	247(16.9)
Females	681	126(18.5)
	2136	373(17.5)

Table 2: Age wise prevalence of total and positive samples

Age Group	Total No Samples	Positive Samples	% of positive samples in each group
< 1 Year	540	45	8.3
1-10 Yrs	1112	247	22.2
11-20 Yrs	264	53	20.1
21-30 Yrs	89	11	12.3
31-40 Yrs	62	5	8.1
41-50 Yrs	41	4	9.7
> 50 Yrs	28	8	28.6
	2136	373	

Table 3: Pattern of infection among positive samples

Pattern of infection	Infected cases N=373	(%) of + samples
Single infection	334	89.5
Dual infection	33	8.8
Multiple infection	6	1.6

Table 4: Presenting symptoms among cases

Symptoms	Total no of patients presented	Positive for parasites
Diarrhoea / Dysentery	1103	257(23.3)
Pain Abdomen	587	81(13.8)
Anaemia	138	16(11.6)
Miscellaneous (loss of wt, appetite, pruritus, no symptom)	308	19(6.2)
	2136	373

Parasitic infection was seen more in people belonging to age group of more than 50 years (28.6%), followed by 1-10 years (22.2%),11-20 years (20.1%), 21-30 years (12.3%), 41- 50 years (9.7%) and 31-40 years (8.1%) as shown in Table 2. Also 8.3% of infants were found to be infected with intestinal parasites.

Protozoan parasites were detected in 334/373(89%) positive samples whereas Helminthes were detected in 67/ 373(18%) positive samples. *Giardia lamblia* 200/373(53.6%) was the most common protozoan parasite followed by Coccidian parasites 92/373(24.7%), *Blastocystis hominis* 42/ 373(11.3%), *E. histolytica* 20/373(5.4%). *H. nana* 46/373 (12.3%) was the most common helminth followed by *Ancylostoma duodenale* 12/373(3.2%) and others as shown in Figure 2.

Polyparasitism was detected in 39 (1.8%) patients while 334 (15.6%) samples had a single parasitic infection. Dual infection was seen in 33 (1.5%) samples and three or more parasites were detected in 6 (0.3%) samples (Table: 3). Diarrhoea/Loose motions (n=257; 23.3%) was the most common presenting symptoms followed by abdominal pain/ discomfort, Anemia and others (Table: 4)

Figure 1: Prevalence trend over three year period

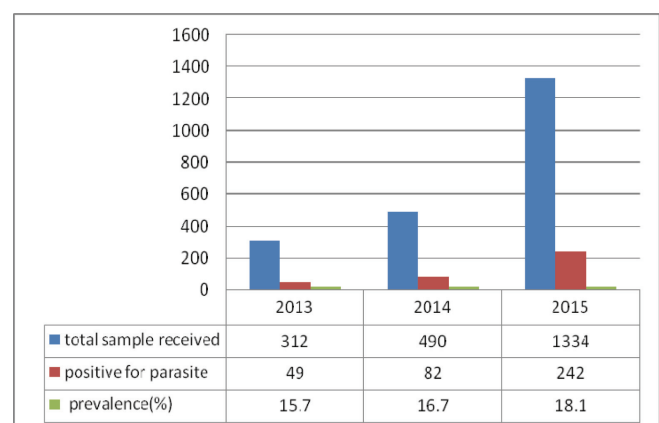
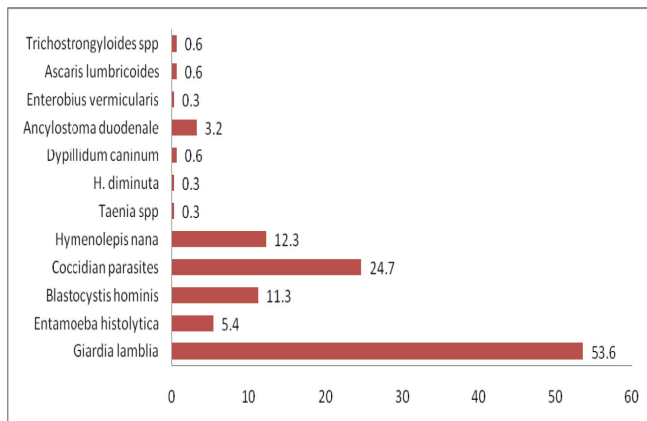


Figure 2: Distribution of parasites among positive samples

DISCUSSION

Human parasitic infection is a global problem of enormous proportion with wide variation in intestinal parasite from region to region; different geographic areas, communities and ethnic groups even seasonal variation are also known⁹. Knowledge of the distribution and extent of Intestinal parasitic infection in a given population is a prerequisite for planning and evaluating intervention program. The primary aim of this study was to know the burden of intestinal parasitic infection among the patients presenting with the symptoms suggestive of such infection in a rural tertiary care hospital. In the developing world intestinal parasitic infection is still an important cause of morbidity and mortality¹⁰. The present study results showed the occurrence of several intestinal parasites of public health importance in people residing in this area.

Out of the total 2136 samples examined during the study, 373 (17.5%) samples were found to carry at least one parasite. The prevalence percent was lower when compared to findings of Marothi *et al.*, (21.4%), Parameshwarappa *et al.*, (27.6%), Prakash *et al.*, (38.1%), Rao *et al.*, (59.5%) and was comparable with those of, Sethi *et al.*, (7.3-15.5%), Khurana *et al.*, (14.6%), and Taruna singh *et al.* (13.9%) while it was more than the findings reported by Beena Jad *et. al* (7.8%), Rajvir Singh *et.al.*(6.7%) and Davane *et al.* (6.63%)¹¹⁻¹⁸. This may be probably due to difference in time, place and methods of examination used.

In the present study, it was observed that prevalence of intestinal parasitic infection was seen more among females (18.5 %) then the males (16.9 %). Similar pattern was obtained in a study from Uttarkhand^{19,20}. This can be better explained as, in addition to household work women in this region are also engaged in handling of livestock and in field work and hence are equally or even more exposed than men to contaminated soil and water, a major predisposing factor for infection.

Over three years the prevalence has seen a steady rise (15.7%- 18.1%). This could be attributed to increase in no of samples received as well as more and more parasites being isolated. The similar pattern was observed by Taruna singh *et. al* from Indore¹⁷.

If the age factor is considered, highest percentage of cases in our study were in >50 yrs group(28.6%) followed by 1-10 years(22.2%) ,11 - 20 years(20.1%), 21-30 years (12.3%), 41- 50 years (9.7%), 31-40 years (8.1%) . Swapna K *et. al* from Uttarakhand have also found similar pattern²⁰. This can be attributed to lesser/reduced immunity among elderly and young children. Also, overcrowding, more outdoor activity and exposure to contaminated surroundings of children and young adults result in increased risk for these infections among them.

In our study, 8.3% of infants were found to be infected with intestinal parasites. None of the previous studies have included children below one year as separate group. Lowest age at which an infant was found to be positive for parasite was three months; this questions weaning practices and personal hygiene of handlers in our area. The parasites detected in this age group were *Giardia lamblia*, *Cryptosporidium spp.* and *Blastocystis hominis*. This can be due to large no of low birth weight babies, rampant malnutrition and poor immunity among these infants.

Protozoan infections are found to be almost five times more than Helminth infections (89% vs 18%). This finds agreement with majority of studies from India. *Giardia* was the most common Protozoa identified in our study accounting for 53.6% of positive samples followed by coccidian parasites, *Blastocystis* and *E. histolytica*. Most of studies from North India have reported similar findings¹⁵⁻²⁰. Non pathogenic cysts were not included as positives though they were obtained in large numbers; this itself questions safety of water in this area. None of the previous studies have mentioned *Blastocystis hominis* which was detected in 11.5% of positive samples in our study majority belonging to patients of age group 0-10 yrs. The pathogenic potential of this supposedly harmless parasite in immunocompromised individuals and young children has been increasingly studied in last decade^{21,22}.

H. nana was the most common helminth found (12.3% of total positive samples) followed by *Ancylostoma duodenale* (3.2%), *Ascaris lumbricoides*(0.6%) , *Dipylidium caninum* (0.6%), *Trichostrongylus spp*(0.6%) , *Taenia spp*(0.3%) , *H. diminuta*(0.3%) and *Enterobius vermicularis*(0.3%). Majority of studies from south have reported *Ascaris* as commonest helminth whereas from North *Ancylostoma*, *H.nana* and *Ascaris* were reported as commonest in varied proportion¹¹⁻²⁰. This can be attributed to the fact that geographical distribution

of intestinal parasites is influenced by the requirement of suitable hosts and favorable environmental conditions.

When pattern of parasitic infection is considered, we found 334 out of 373 (89.5%) positive samples carrying single parasite while 33/373 (8.8%) had two parasites and 6/373 (1.6%) samples contained 3 or more parasites. Marothi et. al, from Ujjain have reported 94.5% single; 4.7% dual & 0.7% multiple infection whereas Taruna singh et. al, from Indore found 66.7% single; 27.7% dual % and 5.5% multiple infection^{11,17}.

Diarrhoea/loose motions, abdominal discomfort/pain and anemia were some of the most common clinical symptoms of patients in the study followed by loss of wt and pruritus. Similar findings were observed by Beena Jad et. al, from Haryana¹⁸.

CONCLUSION

Intestinal parasitic infection is a major problem in our area. The burden of intestinal parasites could still be higher as excretion of parasites is intermittent, sometimes stool may not be the specimen of choice for some parasites such as *Enterobius vermicularis*. Also Coccidian parasites may be missed on wet mount and special stains such as modified Acid Fast Staining should be performed in suspicious cases. In addition concentration methods should be utilized more often. There is a need to create awareness about safe drinking water, personal hygiene and environmental sanitation in addition to specific approach to prevent and control intestinal parasitic infections.

REFERENCES

- World Health Organization. Control of Tropical Diseases. Geneva, Switzerland: WHO; 1998.
- World Health Organization. Prevention and Control of Intestinal Parasitic Infections. Technical Reports Series. WHO; 1987. p. 575-88.
- Blaser MJ, Ravindin JI, Guerrant RL, et al. Gastrointestinal tract infections. In: Richard VG, Hazel MD, Derek W, Mark Z, Peter LC, Ivan MR, et al., editors. MIMS Medical Microbiology. 4th ed. Europe: Mosby Elsevier; 2008. p. 304-11.
- Davane MS, Suryawanshi NM, Deshpande KD. A prevalence study of intestinal parasitic infections in a rural hospital. Int J Recent Trends Sci Technol 2012;2:1-3.
- Ogunlesi T, Okeniyi J, Oseni S, Oyelami O, Njokanma F, Dedeke O. Parasitic etiology of childhood diarrhea. Indian J Paediatr 2006;73:1081-4.
- Vizer G, Patai A, Dobronte Z. Endoscopic treatment of cholestasis caused by *Ascaris lumbricoides*. Orv Hetil 2001;142:681-3.
- Chirdan LB, Yusufu LM, Ameh EA, Shehu SM. Meckel's diverticulitis due to *Taenia saginata*: Case report. East Afr Med J 2001;78:107-8.
- Stephenson LS, Latham MC, Adams EJ, Kinoti SN, Pertet A. Physical fitness, growth and appetite of Kenyan schoolboys with hookworm, *Trichuris trichiura* and *Ascaris lumbricoides* infections are improved four months after a single dose of albendazole. J Nutr 1993;123:1036-46.
- Tedla S. Intestinal helminthiasis in man in Ethiopia. Helminthologia 1986;23:43-8.
- Tanowitz HB, Weiss LM, Wittner M. Tapeworms. Curr Infect Dis Rep 2001;3:77-84.
- Marothi Y, Singh B. Prevalence of intestinal parasites at Ujjain, Madhya Pradesh, India: Five year study. Afr J Microbiol Res 2011;5:2711-4.
- Parameshwarappa KD, Chandrakanth C, Sunil B. The prevalence of intestinal parasitic infestations and the evaluation of different concentration techniques of stool examination. J Clin Diagn Res 2012; 6:1188-91.
- Prakash O, Tandon BN. Intestinal parasites with special reference to *Entamoeba histolytica* complex as revealed by routine concentration and cultural examination of stool samples from patients with gastrointestinal symptoms. Indian J Med Res 1966; 54:10-4.
- Rao VG, Aggrawal MC, Yadav R, Das SK, Sahare LK, Bondley MK, et al. Intestinal parasitic infections, anaemia and undernutrition among tribal adolescents of Madhya Pradesh. Indian J Community Med 2003; 27:26-9.
- Sethi S, Sehgal R, Malla N, Dudev ML, Mahajan RC. Changing trends of intestinal parasitic infections in Chandigarh (Northern India): Hospital based study. Indian J Med Microbiol 2000;18:106-9.
- Khurana, S., Aggarwal, A., & Malla, N. Comparative analysis of intestinal parasitic infections in slum, rural and urban populations in and around union Territory, Chandigarh. J Commun Dis 2005. 37, 239-243.
- Singh T, Bhatambare GS, Deshmukh AB, Bajpai T, Srivastava I, Patel KB. Study of the prevalence of intestinal parasitic infections in a tertiary care hospital located in central India. Int J Health Syst Disaster Manage 2014; 2:113-6.

18. Jad B, Raina S, Grover PS. Prevalence of intestinal parasites among patients of a tertiary hospital in Ambala city, Haryana, India. *Int J Res Med Sci* 2015; 3:3753-8.
19. Rajvir Singh, Pooja Singla, Madhu Sharma, Aparna, and Uma Chaudhary. Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital in Northern India: Five year retrospective study. *Int.J.Curr.Microbiol.App.Sci* (2013) 2(10): 112-117.
20. Kotian S, Sharma M, Juyal D, Sharma N. Intestinal parasitic infection-intensity, prevalence and associated risk factors, a study in the general population from the Uttarakhand hills. *Int J Med Public Health* 2014;4:422-5.
21. Kaya S, Cetin ES, Aridogan BC, Arikan S, Demirci M. Pathogenicity of *Blastocystis hominis*, a clinical reevaluation. *Turkiye Parazitoloj Derg.* 2007; 31(3):184-7.
22. Uma Sekar and M. Shanthi. *Blastocystis*: Consensus of treatment and controversies. *Trop Parasitol.* 2013 Jan-Jun; 3(1): 35–39.

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