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Original Research Article

Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital in Northern India: Five year retrospective study

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A B S T R A C T

Intestinal parasitic infections are highly prevalent among the general population in developing countries and these infections can lead to a number of adverse effects like anaemia, reduced physical growth, mental retardation, abdominal colic, cholestasis, cholecystitis and pancreatitis. To determine the prevalence of intestinal parasites among patients attending various outdoor departments of our hospital. A retrospective laboratory analysis of stool samples was carried out for intestinal parasitic examination in a tertiary care hospital. The records were collected from Microbiology Laboratory for a period of five years (January 2008 to December 2012). Material and methods: Stool samples were examined by direct smears (saline and Lugol's iodine) and concentration techniques. Saturated salt solution floatation technique and formalin-ether sedimentation technique was used for concentration. In our study the prevalence of intestinal parasitic infection was 6.68%. There were nine different parasites encountered. The most common parasite identified was *Giardia lamblia* 58.5%, followed by *Entamoeba histolytica* 32%, and *Ascaris lumbricoides* 5.8%. The other parasites detected were *Taenia* species, *H. nana*, *E. vermicularis* and *Ancylostoma duodenale*. Intestinal parasitic infections are an important public health problem. It is necessary to develop effective prevention and control strategies including health education and environmental hygiene.

Keywords

Parasites; Infections; Protozoa; Helminthes; *Giardia; Entamoeba; Ascaris.*

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. The prevalence of different parasitic diseases 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 (Mohammad *et al.,* 2012, Ekpenyong *et al.,* 2008). WHO Global Burden of Disease 2004 report suggests that approximately 150.9 million people worldwide has high intensity infection by intestinal nematodes while 37.7 million people alone from south East Asia are infected (WHO report, 2008). Worm's

infestation is a major problem in children from developing countries. The morbidity caused by helminthic infections includes malnutrition, growth retardation, vitamin A deficiency, anaemia etc. Good environmental sanitation and a high standard of living have resulted in a reduction in the prevalence of intestinal parasites in developed countries (WHO report, 1987). Therefore, in view of significant importance of intestinal parasitic infections in developing countries, the present study was undertaken to determine the prevalence of intestinal parasitic infections in general population attending outdoor departments of our institute.

Materials and Methods

This was a retrospective study carried out in the Department of Microbiology, Pt. B. D. Sharma, UHS, Rohtak, Haryana for a period of five years (January 2008 to December 2012). Stool samples were collected in a wide mouthed clean, dry, properly labeled plastic container without preservatives from 20751 patients irrespective of age and sex attending outdoor department of our hospital with symptoms suggestive of parasitic infections. One hundred fifteen patients who were not able to provide adequate sample were not included in the study. Stool samples were transported to laboratory within one or two hours of collection and were processed immediately thereafter. Macroscopic examination was done to look for colour, consistency, presence of mucus and blood, and presence of parasitic structures such as proglottids, scolices, adult tapeworm, enterobius, ascaris, or hookworm. For microscopic examination, saline wet mount and Lugol's iodine wet mount was prepared. Saline wet mount was done to detect protozoal trophozoites and helminthic eggs or larvae and iodine wet mount was done to detect cysts. Concentration was done by saturated salt solution technique and formalin-ether sedimentation technique (Chatterjee, et al. 1995).

Statistical analysis

For comparison of two or more set of variables, p value was calculated by using software SPSS version 17. If p value was ≤ 0.05 then it was taken as significant.

Result and Discussion

A total of 20751 stool samples were examined, out of which 1386 (6.68%) revealed presence of parasites. There was no statistically significant difference in the percentage of intestinal parasites according to the age or gender of the patients ($p > 0.05$). Protozoal cysts or trophozoites were detected in 1255 (90.5%) samples and helminthic eggs/ova were found in 136 (9.8%) positive samples. The parasites detected were *Giardia lamblia* 810 (58.5%), followed by *Entamoeba histolytica* 445 (32%), *Ascaris lumbricoides* 81 (5.8%), *Hymenolepsis nana* 22 (1.5%), *Taenia* spp. 18 (1.2%), *Ancylostoma duodenale* 8 (0.5%) and *E. vermicularis* 7 (0.5%) (Table2). Parasitic infection was found more common in adults 806/1386 (58.1%) than children 580/1386 (41.8%).

In the present study the prevalence of parasitic infections was 6.68%. Our results were in accordance with a past study from India (Davane., *et al*. 2012).

Many other studies from India have reported varying rates of intestinal parasitic infections such as 24.78% by Shrihari., *et al*. 2011, 47.08% by Singh., *et al*. 1991, 26.1% by Dudeja., *et al*. 2012, and 23.6% by Das., *et al*. 20007.

Table.1 Gender wise distribution of positive cases (M=male, F=female**)**

Years	Total number of samples	Total number of positive samples			Percentage of total positive samples
		Total	M	F	
2008	5378	154	103(66.9%)	51(33.1%)	2.86
2009	4039	101	67(66.3%)	34(33.7%)	2.50
2010	4164	150	101(67.3%)	49(32.7%)	3.63
2011	3973	676	463(68.5%)	213(31.5%)	17.01
2012	3197	305	207(67.9%)	98(32.1%)	9.54
TOTAL	20751	1386	943(68%)	443(31.9%)	6.67

Figure.1 Year wise distribution of intestinal parasites

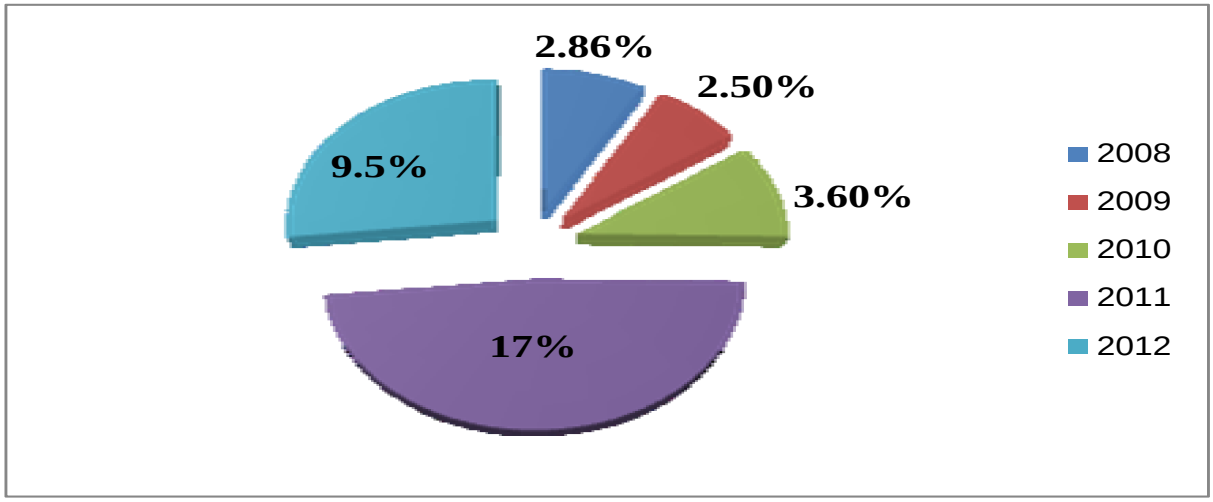

Figure.2 Distribution of different intestinal parasites

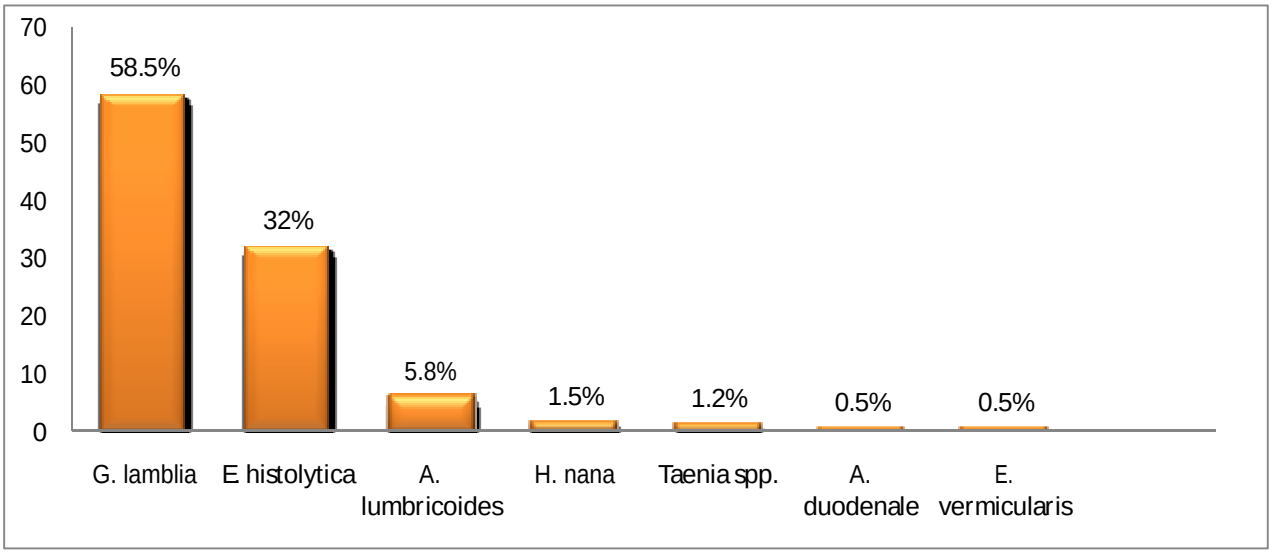

Table.2 Year wise distribution of different intestinal parasites

Name of the Parasite	2008(n=154) n (%)	2009(n=101) n (%)	2010(n=150) n (%)	2011(n=676) n (%)	2012(n=305) n (%)
E. histolytica	62 (40.2%)	34(33.7%)	34(22.7%)	195(28.9%)	120(39.4%)
G. lamblia	82(53.3%)	58(57.4%)	106(70.7%)	442(65.4%)	122(40%)
A.lumbricoides	8(5.2%)	4(3.9%)	9(6%)	20(2.9%)	35(11.5%)
A. duodenale	0	1(0.9%)	1(0.7%)	4(0.6%)	2(0.7%)
Taenia spp.	0	0	0	5(0.75%)	13(4.3%)
E. vermicularis	0	0	0	0	7(2.3%)
H. nana	2(1.3%)	4(3.9%)	0	10(1.5%)	6(1.9%)

Table.3 Distribution pattern of different intestinal parasites among children (<15 years) and adults

Name of the Parasite	2008 (n=154)		2009(n=101)		2010(n=150)		2011(n=676)		2012(n=305)	
	<15	Adults	<15	Adults	<15	Adults	<15	Adults	<15	Adults
E. histolytica	33	29	25	9	9	25	63	132	53	67
G. lamblia	59	23	38	20	46	60	130	312	53	69
A.lumbricoides	6	2	3	1	7	2	8	12	15	20
A.duodenale	0	0	0	1	1	0	4	0	2	0
Taenia spp.	0	0	0	0	0	0	2	3	6	7
E. vermicularis	0	0	0	0	0	0	0	0	5	2
H. nana	1	1	3	1	0	0	7	3	1	5
Total	99 (64.2%)	55 (35.7%)	69 (68.3%)	32 (31.6%)	63 (42%)	87 (58%)	214 (31.6%)	462 (68.3%)	135 (44.2%)	170 (55.7%)

Low prevalence rate in our study is an indication of better awareness of personal hygiene and better sanitation and drinking water facilities in this area. The present study showed higher rate of infection in males than females (68% and 31.9% respectively) which was in accordance with the study by Parameshwarappa., *et al*. 2012, however, in many other studies from India as well as from other parts of world infection rate was reported higher in *E. vermicularis* 7 (0.5%). Study from Maxico shows that *Giardia lamblia* and *Hymenolepis nana* was detected more commonly than *Ascaris lumbricoides* and *Entamoeba histolytica* in school children (Quihui., *et al*. 2006). In various other studies, rate of *E. histolytica* was found to range from 20% to 65.57% (Shrihari., *et* females as compared to males (Tang., *et al*. 2003, Wagayehu., *et al*. 2013). In this study, the protozoal infections (90.5%) was much more common than helminthic infections (9.8%). The prevalence of *Giardia lamblia* 810 (58.5%) was highest, followed by *Entamoeba histolytica* 445 (32%), *Ascaris lumbricoides* 81 (5.8%), *Hymenolepis nana* 22 (1.5%), *Taenia* spp. 18 (1.2%), *Ancylostoma duodenale* 8 (0.5%) and *E. vermicularis* 7 (0.5%). Study from Maxico shows that *Giardia lamblia* and *Hymenolepis nana* was detected more commonly than *Ascaris lumbricoides* and *Entamoeba histolytica* in school children (Quihui., *et al*. 2006). In various other studies, rate of *E. histolytica* was found to range from 20% to 65.57% (Shrihari., *et al*. 2011, Parameshwarappa., *et al*. 2012). Kang G., *et al* 1998, in their study, showed that the commonest parasitic infection was Hookworm (61.5%), followed by *Giardia* (53.8%) and *Cryptosporidium* (39.7%) and they also showed that older children and adults had a higher prevalence of parasitic infections as compared to preschool

children. In our study rate of parasitic infection was also high in adults than children. Contrary to our study many studies have shown *Ascaris lumbricoides* as predominant parasite infecting humans but in our study it was only 5.8% (Choubsia., *et al* 2006, Comfort., *et al* 2008). The prevalence of other parasites was low in our study and the major drawback of our study was that no acid fast staining was not performed for the detection of *Cryptosporidium* oocysts which is an important pathogen in HIV infected patients.

In Microbiology laboratories, the concentration methods should be performed routinely for the examination of parasites. Concentration permits the detection of the organisms which are present in small number, these may be missed by using direct wet mounts. 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 and proper cooking of food.

References

Chatterjee, KD.,1995. Parasitology: 12th ed, Chatterjee Medical Publishers, Calcutta, India, pp.211.

Choubsia, SL., and Leela C.2006.Intestinal helminthic infections in tribal population of Southern, Rajasthan, India. J. Parasitic dis. 30(2): 163-67.

Comfort, AI., and Omalade, O.2008.The Prevalence and intensity of Soil transmitted helminthes in a rural community, Lagos Suburb, South West Nigeria, Int. J. Agri. Biol. 10(1): 89-92.

Das, S., Saha, R., and Singhal, S.2007. Ind. J. Community. Med. 32:27-31.

Davane, MS., Suryawanshi, NM., and Deshpande, KD.2012. A prevalence study of intestinal parasitic infections in a rural hospital. Int J. Recent Trend. Sci. Technol. 2(1):1-3.

Dudeja, M., Nandy, S., Das, AK., Alam, S., and Tiwari, R.2012. Prevalence of Intestinal Parasites in slum areas of Southern Delhi. Int. J. Microbiol. Res. 4(8):312-15.

Ekpenyong, E.2008. Prevalence of intestinal helminthic infections among schooling children in tropical semi urban communities. Anim. Res. Int. 5:804-810.

Kang, G., Mathew, MS., Rajan, DP., Daniel, JD., Mathan, MM., and Mathan, VI, et al. 1998.The prevalence of intestinal parasites in rural southern Indans. Trop. Med. Int .Health. 3(1): 70-75.

Mohammad, KAE., Mohammad, AAE., El-nour, MFA., Saad, MY., and Timsah, AG.2012. The prevalence and associated risk factors of intestinal parasitic infections among school children living in rural and urban communities in Damietta Governorate, Egypt. Academia Arena. 4(5):90-97.

Parameshwarappa, KD., Chandrakanth, C., and Sunil, B.2012. The prevalence of intestinal parasitic infestations and the evaluation of different concentration techniques of the stool examination. J. Clin. Diag. Res. 6:1188-1191.

Quihui, L., Valencia, ME., Crompton, DWT., Phillips, S., Hagan, P., and Morales, G., et al.2006. Role of the employment status and education of mothers in the prevalence of intestinal parasitic infections in Mexican rural school children. BMC Public Health. **6**:225-8.

Report of WHO expert committee. Prevention and control of intestinal

parasitic infections. World Health Organ Tech Rep Ser 1987;749:1-86.

Shrihari, N., Kumudini, TSD., Mariraj, J., and Krishna, S.2011. The Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital-a retrospective study. J. Pharma.Biomed. Sci. 12(13):1-3.

Singh, P., Gupta, ML., Thakur, TS., and Vaidya, NK.1991. Intestinal parasitism in Himachal Pradesh, Ind. J. Med .Res. 45: 201-04.

Tang, N.2003. A cross-sectional study of intestinal parasitic infections in a rural district of west China. Can J Infect Dis. 14(3):159-162.

Wagayehu, T., Tsalla, T., Seifu, B., and Teklu, T.2013. Prevalence of intestinal parasitic infections among highland and lowland dwellers in Gamo area, South Ethiopia. BMC Public. Health. 13:151-7.

WHO.2008. The global burden of disease: 2004 updates, Geneva: World Health Organization