

Prevalence of Parasitic Infections in Tertiary Care Centre

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Abstract

Parasitic infections, caused by Protozoa and intestinal helminths, are prevalent mostly in developing countries than in developed countries. This is due to poor sanitation and personal hygiene. A laboratory analysis of stool samples in Microbiology laboratory of a tertiary care hospital for a period of one and half years is done for detection of parasitic infections. In our study, 474 stool samples were analysed and prevalence of intestinal parasitic infections was found to be 6.96% (33/474). Eosinophil count of infected patients is also analysed. High eosinophil count is seen among most of the infected patients. There were five different parasites encountered. The most common parasite identified was *Giardia lamblia* (51.51%), followed by *Entamoeba histolytica* (21.21%), *Hookworm* (15.15%), *Strongyloides stercoralis* (6.06%) and *Cryptosporidium parvum* (6.06%).

Key Words-Entamoeba, Eosinophil count, Giardia, Immunological investigations, Infection, Parasite, Prevalence, Stool routine examination.

INTRODUCTION

Parasitic infections are caused by helminths, Protozoa and other infectious parasites. These infectious agents are broadly classified into macro parasites, which mainly comprises of helminths, and micro parasites, which mainly comprises of viruses, bacteria, and protozoa.[1] Helminths produces eggs or larvae that develop in the environment (an intermediate host) before they become capable of infecting people. In contrast, protozoa multiplies inside host by cell division. Parasites usually enter the body through mouth and skin. Parasites that enter through mouth are swallowed and can remain in the intestine or burrow through the intestinal wall and lives in the digestive tract. Thus, parasites or their eggs are often present in the feces. Doctors diagnose the infection by taking samples of blood, stool, urine, phlegm or other infected tissues and send them to laboratory for analysis. The diseases caused by these parasites such as amoebiasis, giardiasis, ascariasis and hookworm infections which may lead to iron-deficiency anemia, chronic diarrhoea, seizures and portal hypertension.[2]

Prevalence of parasitic infections is more in developing countries than in developed countries, due to poor sanitation and inadequate personal hygiene. These infections in developed countries may be due to immigration. In a study on Parasitic diseases and urban development, parasitic infections in urban areas is due to high population densities with inadequate housing, poor or absent sanitation and water supply.[3] The prevalence of intestinal parasitic infections varies place to place in relation to the pattern of transmission of disease.[4]

It is estimated that as much as 60% of world's population is infected with gut parasites, which may play a role in morbidity due to intestinal infections. The commonest parasitic infections reported globally are *Ascaris* (20%), hookworm (18%), *Trichuris trichuira* (10%), and *Entamoeba histolytica* (10%) [5].

AIM AND OBJECTIVES

This retrospective study was done to assess the prevalence of intestinal parasitic infections among patients in tertiary healthcare centre and to analyze age, gender, and eosinophil count related trends in the prevalence of these intestinal parasites over a period of one and half years.

MATERIALS AND METHODS

In this retrospective analysis of stool routine examination was done from a period of July 2017 to December 2018 after getting clearance from Institutional Human Ethical Committee (IHEC). The IHEC approval number was SMC/IEC/2018/11/530. Stool routine examination for parasitic prevalence was done by following methods. Macroscopic examination was done to look for colour, consistency, presence of mucus and blood and presence of parasitic structures such as proglottidis, scoliosis, adult tapeworm, enterobius, ascaris, or hookworm. For microscopic examination saline wet mount was done to detect protozoa trophozoites and helminthic eggs or larvae and iodine wet mount was done to detect cysts. Stool concentrations was done by Formalin-ether sedimentation technique and zinc sulphate flotation method. Modified Ziehl Neelsen staining was also done for all samples to detect acid fast parasites. The statistical analysis was done with chi-square test.

RESULTS AND DISCUSSION

In this study a total number of 474 stool samples were collected from In patients of a tertiary care centre.

In this retrospective study, age, gender, and eosinophil counts are analysed. Among the total 474 stool samples, 6.96% (33/474) were positive for intestinal parasitic infections. These samples are collected from various departments of the tertiary care centre. (chart 1.)

In our study, maximum positive cases were from General

medicine department (48.48%) followed by Paediatrics department (36.36%) and then General surgery department(12.12%). The largest number of parasitic infections were found in children aged below 1 year and is less among adult groups.(18-55 years)(Table 1.) In a similar study,the infection rate was highest in the 2-14 years age group (25.5%) and in rural residents (23.7%)[6] In a similar study conducted by Saroj Golia et al., the intestinal parasitic infection was common among children among age group between 6 to 8 years[7]. In a study conducted by Ganesh Kumar Singh et al., the children between 5 to 14 years(20.66%) were more prevalent to intestinal parasitic infections followed by people of age more than 45 years.[8] Similar results were obtained in other studies.[9]

Our study showed prevalence of intestinal parasitic infection was in female(63.63%) than in males(36.36%). In a similar study conducted by Kan et al., in Malaysia, the average percentage prevalence of parasitic infections is high among females (38.4%) than males (37.8).[10] In a similar studies done in Bihar showed increased occurrence of parasitic infections among females (56%). [1]

In our study, the protozoa infection (78.78%) was more compared to helminthic infestation(21.21%). In a similar study conducted by Narayan Shrihari et al., the infections caused by protozoa were more common than helminths.[12] As shown in the pie figure 2, *Giardia lamblia* (51.51%) was found to be the commonest parasites causing intestinal parasitic infections. The others were *Entamoeba histolytica* (21.21%), *Hookworm* (15.15%), *Strongyloides stercoralis* (6.06%) and *Cryptosporidium parvum* (6.06%).

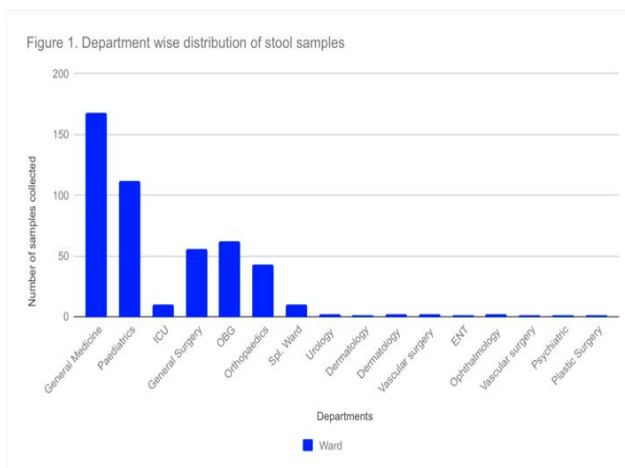


Figure 1

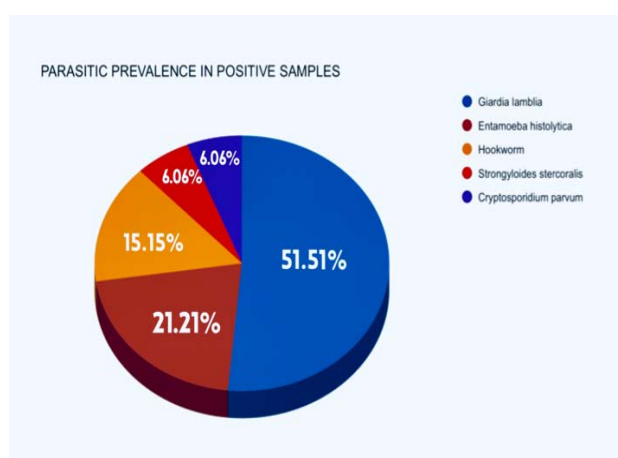


Figure 2. Parasitic prevalence in positive samples

Table 1. Age wise distribution of positive samples

S.No.	AGE(years)	SEX	
		MALE	FEMALE
1	<1	4	6
2	1-14	3	3
3	15-44	2	3
4	45-64	1	3
5	65<	2	6
	TOTAL	12	21

Table 2. Normal and abnormal eosinophil count among positive and negative samples

EOSINOPHIL COUNT	STOOL SAMPLE		TOTAL
	POSITIVE	NEGATIVE	
NORMAL	8	384	392
ABNORMAL	25	57	82
TOTAL	33	441	474

In a study conducted by Jaran et al., in Jordan, parasitic infection has been found to be most prevalent in rural areas and refugee camps. The current study shows that intestinal parasitic infections are common in urban areas of Jordan 44% (9611/21906). Among the total 9611 positive samples, *Giardia lamblia* is the most prevalent parasite 41% (3953/9611), followed by *Entamoeba histolytica* 31% (3021/9611).[13] In a study conducted by Fernandez MC et al., in Chennai in 2002, the prevalence of *Giardia lamblia*(22.6%) is more than *Entamoeba histolytica*(10.6%). [14] These results also matches with other studies.[15] In a similar study conducted in Chandigarh, *Giardia lamblia* was the most common parasite detected (4-9 percent) followed by *Entamoeba histolytica* (1 to 3 percent).[16]

The stool sample analysis is important in diagnosis of intestinal parasitic infections than other conventional methods.Surveys of giardiasis may give underestimates of prevalence or misleading results because of the irregular release of cysts (the detection of which in stool is the basic test for giardiasis) may result in their not being detected when only one stool sample is examined. So multiple stool samples are required. [5].Early treatment of intestinal parasitic infections reduces morbidity and mortality.

In table 2, the chi square statistic value is 84.7224. The p-value is <0.00001. The result is significant at p<0.05. Thus

the null hypothesis is rejected. Thus the eosinophil count is increased in samples positive for intestinal parasitic infections. In a similar study conducted by Yahya T. et al., eosinophilia in *Entamoeba histolytica* and *Hymenolepis nana* infections was present.[17] In an experimental research done by Celia Maxwell et al., the patients tested with hookworm developed eosinophilia.[18] This result matches with other similar studies.[19]

CONCLUSION

In this study, the most common parasite causing infection is *Giardia lamblia*. There is always a correlation between eosinophil count and parasitic infection. Thus the eosinophil count can be used as an indirect examination for parasitic infestation.

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