

Detection and Prevalence of Common Intestinal Parasites in Stool Samples

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Abstract

Background: To detect and record prevalence of common intestinal parasites in stool samples. **Methods:** A total of 1012 stool samples collected in the department of Microbiology in last 6 months was taken into the study. The samples were grossly examined for color, consistency, mucus, frank blood and presence of proglottids. Stool concentration with ethyl acetate was carried out when there was clinical suspicion of parasite infection. **Results:** Type of parasites detected was *Entamoeba histolytica* in 8.5%, *Entamoeba coli* in 1.1%, *Giardia lamblia* in 2.4%, *Ascaris lumbricoides* in 0.25% and *Taenia* in 0.04%. A significant difference was observed ($P < 0.05$). Sensitivity of different parasitic examination methods used was 40% in simple salt floatation, 34% in Routine wet and iodine mount, 53% in Zinc sulphate centrifugal floatation and 65% in Formol-ether concentration. A non-significant difference was observed ($P > 0.05$). **Conclusions:** Common parasites found to be *Entamoeba histolytica*, *Entamoeba coli*, *Giardia lamblia*, *Ascaris lumbricoides* and *Taenia*.

Keywords:- *Entamoeba coli*, Intestinal parasites, Stool.

INTRODUCTION

Parasitic infections are a major public health problem worldwide; particularly in the developing countries.^[1,2] The prevalence of the intestinal parasitic infections varies from one region to another and it also depends largely on the diagnostic methods which are employed and the number of stool examinations which are done.^[3] In India, malnutrition, unhygienic conditions, the improper disposal of sewage and the non-availability of potable water supplies in the rural and the urban areas are responsible for the high rate of intestinal parasitic infections.^[4] Parasitic infections are globally widespread with their prevalence differing with the level of sanitation, associated with poverty, malnutrition, overcrowding and

tropical climate.^[5] The lack of personal hygiene, water contamination and poor food hygiene play a major role in transmission of such infections.^[6]

Stool examination is a common laboratory test routinely done in microbiology laboratory to screen for the gastrointestinal parasites and other disorders.^[7] The common parasitic forms identified in stool include trophozoites and cysts of protozoans like *Entamoeba histolytica* and *Giardia lamblia*, and eggs of helminthes like *Ascaris lumbricoides*, *Ancylostoma duodenale* and *Enterobius vermicularis*. Complete worms or segments of *Taenia* worm can also be seen.^[8]

These infestations are responsible of high morbidity and mortality. These are particularly prevalent in disadvantaged communities, particularly in tropical and subtropical areas, because of their hot and humid climate and also because health conditions are often faulty and/or access to drinking water is more difficult.^[2] Considering this, the present study was selected for the detection and prevalence of common intestinal parasites in stool samples.

MATERIAL AND METHODS

A total of 1012 stool samples collected in the department of Microbiology in last 6 months was taken into the study. These samples were collected from various other specialities such as general surgery, general medicine, orthopaedics, gynaecology, emergency ward etc.

Stool was collected in wide mouthed, clean containers. The samples were grossly examined for color, consistency, mucus, frank blood and presence of proglottids. The samples were examined within 1 hour of collection. Saline and iodine wet mounts were prepared by adding a drop of saline and Lugol's iodine to clean glass slides and then mixed with a small amount of stool. A cover slip was placed and the slide was visualized microscopically first at low power to detect trophozoites and eggs and then at higher

power for morphological details. Stool concentration with ethyl acetate was carried out when there was clinical suspicion of parasite infection. Results of the present study after recording all relevant data were subjected for statistical inferences using chi- square test. The level of significance was significant if p value is below 0.05 and highly significant if it is less than 0.01.

RESULTS

Maximum cases were detected in age group 0-10 years in 32%, 21-30 years in 20%, 31-40 years in 18%, 41-50 yeas in 11%, >50 years in 10% and 11-20 years in 9%. A significant difference was observed ($P < 0.05$) [Table 1].

Type of parasites detected was Entamoeba histolytica in 8.5%, Entamoeba coli in 1.1%, Giardia lamblia in 2.4%, Ascaris lumbricoides in 0.25% and Taenia in 0.04%. A significant difference was observed ($P < 0.05$) [Table 2, Figure 1].

Sensitivity of different parasitic examination methods used was 40% in simple salt floatation, 34% in Routine wet and iodine mount, 53% in Zinc sulphate centrifugal floatation and 65% in Formol-ether concentration. A non- significant difference was observed ($P > 0.05$) [Table 3].

Table 1: Age distribution

Age group (Years)	Percentage	P value
0-10	32%	<0.05
11-20	9%	
21-30	20%	
31-40	18%	
41-50	11%	
>50	10%	

Table 2: Type of parasites

Parasites	Percentage	P value
Entamoeba histolytica	8.5%	<0.05
Entamoeba coli	1.1%	
Giardia lamblia	2.4%	
Ascaris lumbricoides	0.25%	
Taenia	0.04%	

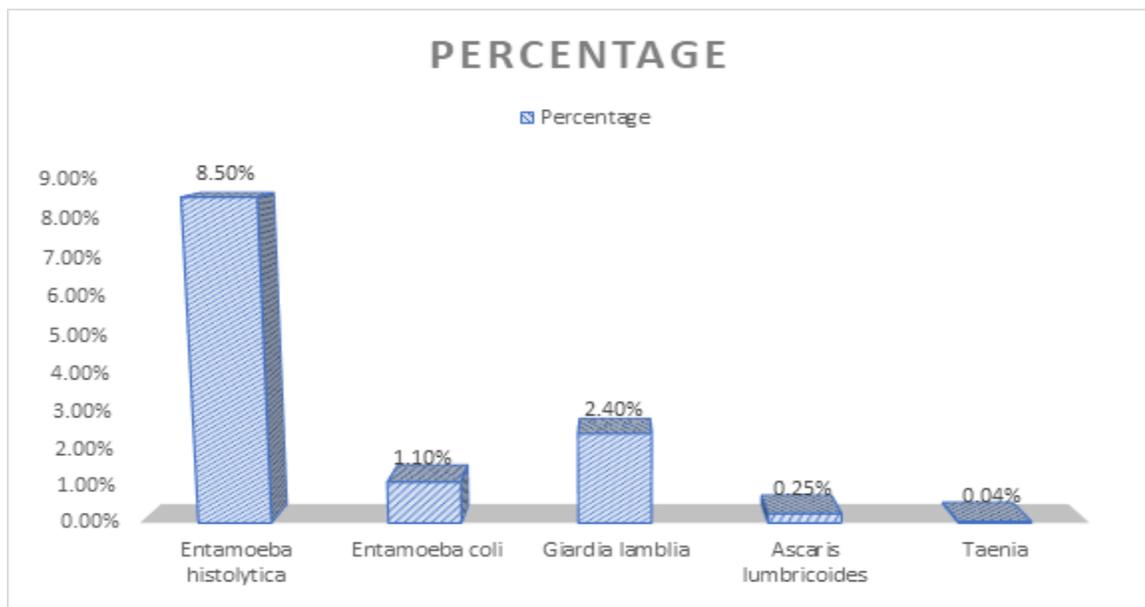


Table 3: Sensitivity of different parasitic examination methods.

Procedure	% positive for parasites	P value
Simple salt floatation	40%	>0.05
Routine wet and iodine mount	34%	
Zinc sulphate centrifugal floatation	53%	
Formol-ether concentration	65%	
Formol-ether concentration	65%	

DISCUSSION

We selected present study for the detection and prevalence of common intestinal parasites in stool samples.^[10] The number of people who are affected by Giardia lamblia, whipworm, roundworm and hookworm in the developing world has been estimated to be 200, 500, 700 and 800 million respectively.^[11] The conventional

methods which are used for the detection of intestinal parasites from stool include the direct wet mount and the iodine mount. The conventional methods lack sensitivity in the detection of parasites in the stool specimens.^[12] The detection of parasites in the faecal specimens is enhanced by the use of concentration procedures.^[13] Various concentration techniques like simple slat

floatation, Zinc sulphate centrifugal floatation, formol ether concentration and modified formol-ether concentration are employed for the diagnosis and the epidemiologic surveillance of parasitic infections in humans. These techniques increase the detection of the helminthic eggs, larvae and the protozoan cysts.^[14] Certain techniques like formol-ether concentration have the advantages of less alteration to the organisms and an increased recovery of the *Schistosoma* spp. and operculated eggs. In view of the increasing polyparasitism in the developing countries, there is a need of sensitive diagnostic tools that are simple to apply and to concurrently detect different intestinal parasite species in the same stool sample.^[15]

In our study maximum cases were detected in age group 0-10 years in 32%, 21-30 years in 20%, 31-40 years in 18%, 41-50 years in 11%, >50 years in 10% and 11-20 years in 9%. Parameshwarappa et al,^[16] in their study a total of 1000 stool samples were collected from the rural and the urban populations and each stool sample was examined by gross examination, direct microscopic examination by using saline and iodine preparations and by concentration techniques like simple slat floatation, Zinc sulphate centrifugal floatation, formol-ether concentration and modified formol-ether concentration. The prevalence of the intestinal parasitic infections was higher in the rural population. A male predominance was noted (33.29%) in both the populations. Children who were between 10-20 years of age had the highest prevalence of the parasitic infestations.

Our study showed that type of parasites detected was *Entamoeba histolytica* in 8.5%, *Entamoeba coli* in 1.1%, *Giardia lamblia* in 2.4%,

Ascaris lumbricoides in 0.25% and *Taenia* in 0.04%. Chavan et al,^[17] conducted a study in which the records of 10,336 stool samples from both outpatient and inpatient departments were examined. Out of these samples, 9904 were finally included for the present retrospective study. Both hanging drop and routine examination was done for 976 (9.85%) samples and routine examination was done for 8928 (90.14%) samples. Stool samples collected were examined grossly and microscopically for presence of any infectious parasites. The most common parasite detected in the stool samples was *Entamoeba histolytica* with higher percentage of cases seen in females (60%) and age group of 0-10 years (33.33%). The pathogenic parasites detected were *Entamoeba histolytica* cysts and trophozoites in 720 samples (7.26%) followed by trophozoites and cysts of *Giardia lamblia* in 128 samples (1.29%), ova of *Ascaris lumbricoides* in 14 samples (0.14%) and ova of *Taenia* in 2 samples (0.02%).

Diongue et al,^[18] in their study 2578 patients were included. In total, 408 samples were positive showing 440 intestinal parasites; this corresponds to prevalence of 15.8%. Parasites were detected in monoparasitism (85.7%) and multiparasitism (14.3%). The most common species found in monoparasitism were *Entamoeba coli* (38.9%), *E. histolytica/dispar* (12.7%), *Giardia intestinalis* (8%), and *Ascaris lumbricoides* (7.3%). The most common associations were *A. lumbricoides-Trichuris trichiura* (3.6%) and *E. coli-G. intestinalis* (2.7%). Non-hospitalized patients were significantly more affected with 65.4% compared to hospitalized counterparts; and also there were more men (50.7%) than women. With 67.4%, adults were the most affected age group, while the elderly were less affected with only 7%. This

study shows increasing prevalence of intestinal parasitic infections over the years. So health education should be promoted in addition to the already begun mass treatment program. This would help to limit or even halt the spread of these diseases.

CONCLUSIONS

Common parasites found to be *Entamoeba histolytica*, *Entamoeba coli*, *Giardia lamblia*, *Ascaris lumbricoides* and *Taenia*.

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