Detection and prevalence of common intestinal parasites in stool samples at a tertiary care hospital in Hyderabad Karnataka region: A retrospective study

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A B S T R A C T
Introduction: Parasitic infections are globally widespread with their prevalence differing with the level of sanitation, associated with poverty, malnutrition, overcrowding and tropical climate. The common parasitic forms identified in stool of patients include trophozoites and cysts of protozoans like Entamoeba histolytica, Giardia lamblia, etc. The present study was undertaken to know the prevalence of common parasites in stool samples in our tertiary care hospital.

Materials and Methods: The records of 10,336 stool samples from both outpatient and inpatient departments were examined which were received for testing in our microbiology laboratory from the period of January 2016 to January 2018. 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.

Results: 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%).

Conclusion: This study demonstrates that intestinal parasite infections are a public health problem in our study population. Poor sanitation and inadequate environmental conditions constituted the main determining factors that predisposed this population to intestinal parasites.

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1. Introduction
Stool examination is a common laboratory test routinely done in microbiology laboratory to screen for the gastrointestinal parasites and other disorders.1 Parasitic infections are globally widespread with their prevalence differing with the level of sanitation, associated with poverty, malnutrition, overcrowding and tropical climate.2 The lack of personal hygiene, water contamination and poor food hygiene play a major role in transmission of such infections.

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.3 Complete worms or segments of Taenia worm can also be seen.4,5 However, in cases of Strongyloides stercoralis worms, ova or larvae are known to be present.6 Stool sample can also be examined for occult blood especially to confirm or exclude more serious gastrointestinal problems like duodenal or gastric ulcers or gastrointestinal malignancies.

Our hospital is a tertiary care center catering to patients largely from the low socioeconomic population prone for parasitic infections. Hyderabad-Karnataka region is well known for its hot and humid climate. In addition, poverty,
malnutrition, high population density, unavailability of potable water, low health status and a lack of personal hygiene provide optimal conditions for the growth and transmission of intestinal parasites. Hence this study was undertaken to know the prevalence of common parasites in stool samples in our tertiary care hospital.

2. Materials and Methods

This was a retrospective study where records of stool examination done for past 2 years (Jan 2016 to Jan 2018) was studied and detection rate, prevalence and most common parasites were identified. A total of 10,336 stool samples from both outpatient and inpatient departments were received for testing in our microbiology laboratory from the period of January 2016 to January 2018. Out of 10,336 stool samples, 432 samples were excluded from study as they were tested only for occult blood. Hence, the total number of stool samples included in the study was 9904 samples. Out of 9904 stool samples, both hanging drop and routine examination was done for 976 (9.85%) samples and routine examination was done for 8928 (90.14%) samples.

Stool was collected in wide mouthed, clean containers and transported to the laboratory. The samples were grossly examined for color, consistency, mucus, frank blood and presence of proglottids. The samples were microscopically 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.

3. Results

A total of 9904 out of 10, 336 stool samples received for testing from both outpatient and inpatient departments were included in the present retrospective study. These samples were examined in our microbiology laboratory from the period of January 2016 to January 2018. A total of 5312 (53.63%) samples were from male patients and 4592 (46.36%) samples were from female patients. The age distribution of samples in the study is displayed in Table 1.

Among the 9904 stool samples studied, 2304 (23.26%) samples were found to have significant findings and the remaining 7600 (76.73%) samples showed normal findings. Liquid consistency with mucus was seen in 1061(10.71%) samples and 530 (5.35%) samples also showed frank blood mixed with mucus. Out of 2304 significant stool samples, 896 (38.88%) samples showed different parasitic morphological forms, 768 (33.33%) samples showed plenty of motile bacilli and pus cells, 432 (18.75%) samples showed plenty of budding yeast cells with plenty of pus cells and 208 (9.02%) samples showed features of bacillary dysentery with non motile bacilli and plenty of pus cells and red blood cells.

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the non pathogenic parasites identified. The pathogenic parasites detected include Entamoeba histolytica cysts and trophozoites in 720 (7.26%) samples, followed by trophozoites and cysts of Giardia lamblia in 128 (1.29%) samples, ova of Ascaris lumbricoides in 14 (0.14%) samples and ova of Taenia (0.02%) in 2 samples (Table 2).

The most common parasite detected in our study was Entamoeba histolytica with higher percentage of cases seen in females (432, 60.00%) compared to males (288, 40.00%). The highest number of amoebiasis cases were observed in the age group of 0-10 years (33.33%) followed by 51-60 years (13.33%). The age distribution of amoebiasis cases in the study is displayed in the Table 3.

4. Discussion

This is a retrospective study where records of stool examination done for past 2 years were studied. A total of 10,336 stool samples from both outpatient and inpatient departments were received for testing in our microbiology laboratory from the period of January 2016 to January 2018. The total number of stool samples included in the study was 9904 samples, out of which a total of 5312 (53.63%) samples were from male patients and 4592 (46.36%) samples were from female patients.

There is almost an equal distribution of males and females in the study samples. This finding correlates with findings of study done by Shobha M et al and Singh G.K.et al. The highest number of samples were from the age group of 0 to 10 years (30.69%) which is similar to several studies done on intestinal parasitosis. The high infection rate in this age group is because of exposure to contaminated environment in addition to decreased immunity making them susceptible to parasitic infection.

The different parasitic morphological forms identified include Entamoeba coli cysts in 32 samples (0.32%) which are comparable to the findings of the study by Chandrashekar, Vani. They are gut commensals and hence were included in the non pathogenic parasites identified. The pathogenic parasites detected include Entamoeba histolytica cysts and trophozoites in 720 (7.26%) samples, followed by trophozoites and cysts of Giardia lamblia in 128 (1.29%) samples, ova of Ascaris lumbricoides in 14 (0.14%) samples and ova of Taenia (0.02%) in 2 samples.

The most prevalent protozoan causing intestinal infection in our study population was Entamoeba histolytica which compares with several studies done on parasitic intestinal infection. In our study, cysts of Giardia lamblia were the second most common parasite identified similar to results of studies done by Rituparna B et al, Shobha M et al, Marothi Y where as few studies display Giardia lamblia as the most common intestinal parasite. The most common parasite detected in our study was Entamoeba histolytica with higher percentage of cases seen in females (432, 60.00%) compared to males (288, 40.00%).

The highest number of amoebiasis cases were observed in the age group of 0-10 years (33.33%) followed by 51-60 years (13.33%). The comparison of our study and several studies done on intestinal parasitosis with Entamoeba histolytica as the predominant protozoan parasite is displayed in the Table 4.

The recent studies made on intestinal infection demonstrate decreased prevalence of parasitic infection which could be attributed to knowledge about personal hygiene, increased education levels in patient attendees and parents and deworming strategy implemented in preschool and school going children. The high rate of protozoan infection compared to helminthic infection is in accordance with several studies done all over India as well as the world and can be attributed to feco-oral route which is most common route of infection in children.

5. Conclusion

To conclude, this study demonstrates that intestinal parasite infections are a public health problem in our study population. Poor sanitation and inadequate environmental conditions constituted the main determining factors that predisposed this population to intestinal parasites. Improvements in sanitation, limiting open air defecation, provisions of sanitary latrines for all, and hygiene and health education are the required interventions that will be instrumental in preventing these infections. Furthermore, mass deworming programs for school children are highly recommended, as this population can be easily accessed for treatment.

6. Source of Funding

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7. Conflict of Interest

None.

References


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