Content available at: iponlinejournal.com

Indian Journal of Microbiology Research

Journal homepage: www.innovativepublication.com

Original Research Article

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

Sunil Kumar D Chavan[1], Roopa C[2,*]

[1]*Dept. of Microbiology, Government Medical College, Kannur, Kerala, India*
[2]*Dept. of Microbiology, Kamineni Institute of Medical Sciences, Hyderabad, Telangana, India*

ARTICLE INFO

Article history:
Received 27-01-2020
Accepted 26-02-2020
Available online 08-04-2020

Keywords:
Parasitic infection
Intestinal parasites
Protozoa
Entamoeaba histolytics
Trophozoites
Cysts
Stool samples

ABSTRACT

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.

© 2020 Published by Innovative Publication. This is an open access article under the CC BY-NC-ND license (https://creativecommons.org/licenses/by/4.0/)

1. Introduction

Stool examination is a common laboratory test routinely done is 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.[3]

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,

* *Corresponding author*.
E-mail address: drroopachiremath@yahoo.co.in (Roopa C).

https://doi.org/10.18231/j.ijmr.2020.006
2394-546X/© 2020 Innovative Publication, All rights reserved.

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.[2] 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.[3,7]

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 (Figure 1). The age distribution of samples in the study is displayed in the 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.

The different parasitic morphological forms identified include Entamoeba coli cysts in 32 samples (0.32%). They are gut commensals and hence were included in

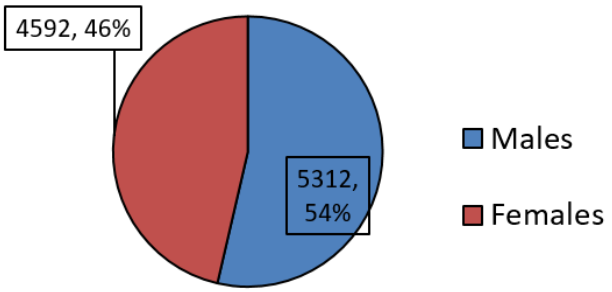

Fig. 1: Gender distribution of samples in the study

Table 1: Age distribution of samples in the study

Age range	Number	Percentage
0-10 years	3040	30.69%
11-20 years	928	9.36%
21-30 years	2032	20.51%
31-40 years	1152	11.63%
41-50 years	992	10.01%
51-60 years	592	5.97%
61-70 years	720	7.26%
71-80 years	336	3.39%
81-90 years	112	1.13%

Table 2: Parasites detected in our study

Parasite detected	Number	Percentage
Entamoeba histolytica	720	7.26%
Giardia lamblia	128	1.29%
Entamoeba coli	32	0.32%
Ascaris lumbricoides	14	0.14%
Taenia	2	0.02%

Table 3: Age distribution of amoebiasis in the study

Age range	Number	Percentage
0-10 years	240	33.33%
11-20 years	32	4.44%
21-30 years	80	11.11%
31-40 years	64	8.88%
41-50 years	80	11.11%
51-60 years	96	13.33%
61-70 years	64	8.88%
71-80 years	48	6.66%
81-90 years	16	2.22%

Table 4: Comparison of studies done on intestinal parasites with Entamoeba histolytics as a predominat protozoan

Study done by	E. histolytica identified (%)	Year of study	Age distribution	Gender distribution
Marothi Y et al	10.5%	2006	0-10 years	Females>Males
Shobha M et al	36.4%	2008	5-14 years	Males >Females
Singh, G.K et al	33.6%	2010	25-45 years	Males >Females
Golia S et al [8]	14.47%	2013	6-8 years	Males>Females
Manochitra K et al [9]	39.7%	2016	31-40 years	Females>Males
Present study	7.26%	2017	0-10 years	Females>Males

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 [2] and Singh G.K.et al. [10] 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. [2,7,10] 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. [11] 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. [1–3,7,10] 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. [1,2,7,11] 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

None.

7. Conflict of Interest

None.

References

1. Rituparna B, Bhattacharya P, Paul UK, Bandyopadhyay A. Prevalence of Intestinal Parasites in a Tertiary Care Hospital in Rural Bihar. Int J Sci Stud. 2017;4(12):89–93.
2. Shobha M, Bithika D, Bhavesh S. The prevalence of intestinal parasitic infections in the urban slums of a city in Western India. J Infect Public Health. 2013;6(2):142–9.
3. Kang G, Mathew MS, Rajan DP, Daniel JD, Mathan MM, et al. Prevalence of intestinal parasites in rural Southern Indians. Trop Med Int Health. 1998;3(1):70–5.
4. Cox FEG. Modern Parasitology: A Textbook of Parasitology, second ed. Wiley-Blackwell Publishers; 1993.
5. Panjarathinam R. Textbook of Medical Parasitology, second ed. India: Orient Longman; 2007.
6. Iqbal Z. Techniques in Parasitology. Pakistan: Higher Education Commission Publishers; 2008.
7. Yogyata M, Binita S. Prevalence of intestinal parasites at Ujjain, Madhya Pradesh, India: Five-year study. Afr J Microbiol Res. 2011;5(18):2711–4.
8. Golia S, Sangeetha KT, Vasudha CL. Prevalence of parasitic infections among primary school children in Bangalore. Int J Basic Appl Med Sci. 2014;4:356–61.
9. Manochitra K, Padukone S, Ajay S, Subh P, Chan A, dra Parija. Prevalence of Intestinal Parasites among Patients attending a Tertiary Care Centre in South India. Int J Curr Microbiol Appl Sci. 2016;5(9):190–7.
10. Singh GK, Parajuli KP, Shrestha M. The prevalence of intestinal parasitic infestation in a Tertiary Care Hospital - a retrospective study. J Nobel Med Coll. 2013;2:13–7.
11. Chandrashekar V. Detection and Enumeration of the Commonest Stool Parasites Seen in a Tertiary Care Center in South India. ISRN Trop Med. 2013;p. 1–6. doi:10.1155/2013/808571.

Author biography

Sunil Kumar D Chavan Associate Professor

Roopa C Associate Professor

Cite this article: Chavan SKD, Roopa C . **Detection and prevalence of common intestinal parasites in stool samples at a tertiary care hospital in Hyderabad Karnataka region: A retrospective study**. *Indian J Microbiol Res* 2020;7(1):24-27.