International Journal of Scholarly Research in
Multidisciplinary Studies
Journal homepage: https://srrjournals.com/ijsrms/
ISSN: 2961-3329 (Online)

(RESEARCH ARTICLE)

Check for updates

Fecal occult blood test and its correlation with Gastrointestinal parasites

Maryam Faridi [1], Pragyan Swagatika Panda [2,*], Man Mohan Mehndiratta [3], Megha Rastogi [4], Swati Sharma [4] and Nazia Khan [1]

[1] *Department of Microbiology, Maulana Azad Medical College, New Delhi, Delhi, India*
[2] *Department of Microbiology, VMMC and Safdarjung Hospital, New Delhi, Delhi, India*
[3] *Director JSSH and HOD Department of Neurology, Janakpuri Superspeciality Hospital, New Delhi,*
[4] *Department of Microbiology, Janakpuri Superspeciality Hospital, New Delhi, Delhi, India*

International Journal of Scholarly Research in Multidisciplinary Studies, 2023, 02(02), 008–012

Publication history: Received on 08 April 2023; revised on 23 May 2023; accepted on 25 May 2023

Article DOI: https://doi.org/10.56781/ijsrms.2023.2.2.0054

Abstract

Stool specimens from – patients in Janakpuri superspeciality hospital were obtained and investigated for gastrointestinal parasites and same were tested for occult blood to analyse the possibility if occult blood corelates with the gastrointestinal parasites. Direct wet mount and iodine wet mounts were examined for detection of gastrointestinal parasites. Fecal occult blood was tested by a commercially available test based on gum guaiac.

Keywords: Gastrointestinal parasites; Occult blood; Fetal occult blood; FOBT; Gum guaiac

1. Introduction

Intestinal parasitic diseases constitute a global health burden in numerous developing countries mainly due to fecal contamination of water and food [1], sympathetic climatic, and environmental and sociocultural factors enhancing parasitic transmissions [2, 3]. The frequency and incidence on intestinal parasites also varies with age, sex and geography [4]. The prevalence of intestinal parasites in India varies from 5.56% to 90% as reported by different workers. [5-10]

2. Material and methods

2.1 Sample collection

Stool samples were obtained from – patients. Patients were provided with clean dry containers and instructions for proper collection of the samples.

2.2 Parasitological examination

Direct wet mounts and iodine mounts were prepared and scanned for different diagnostic stages of the different gastrointestinal parasites.

Direct stool smears were performed by emulsifying 2 mg of stool uniformly in a drop of saline and iodine on two side by side parts of a microscope slide, then covered with cover glasses and scanned microscopically.

* Corresponding author: Maryam Faridi

2.3 Occult blood test

Each stool sample was tested for occult blood using a two field guaic based test (Hemospot, Coral Clinical Systems, a division of Tulip Diagnostics (P) Ltd.) by spreading the stool sample from different parts of the stool using an applicator on two windows A and B of the card.

Hemospot can detect 5 mg/dl or more of haemoglobin levels in stool. Appearance of blue colour within 2 minutes indicates a positive reaction. Traces of blue colouration indicates approximately 5 mg/dl of occult blood in the stool. Strong blue colouration indicates significantly more than 5 mg/dl of occult blood in stool. If blood is present in stool sample, the hematin in the haemoglobin molecule catalyses the release of oxygen from the hydrogen peroxide, which in turn oxidizes the colourless phenolic components of gum guaiac to coloured quinones, the intensity of the colour is proportional to the concentration of Hb.

3. Results

Total 159 samples were obtained in the study. Out of these only 31(19.49%) samples were positive for parasitic infections. The different parasites that were detected were *Entamoeba histolytica (12.90%), Entamoeba coli (3.22%) , Giardia lamblia (70.96%), Hymenolepis nana (6.45%), Ascaris lumbricoides (3.22%),* larva of *Strongyloides stercoralis (3.22%)*. Out of the positive cases of parasitic infection cases that were positive for fecal occult blood test were 14 (45.16%) and cases that were negative for fecal occult blood test were 17 (54.84%).

The p-value is 0.001976. This result is significant at p <0.05.

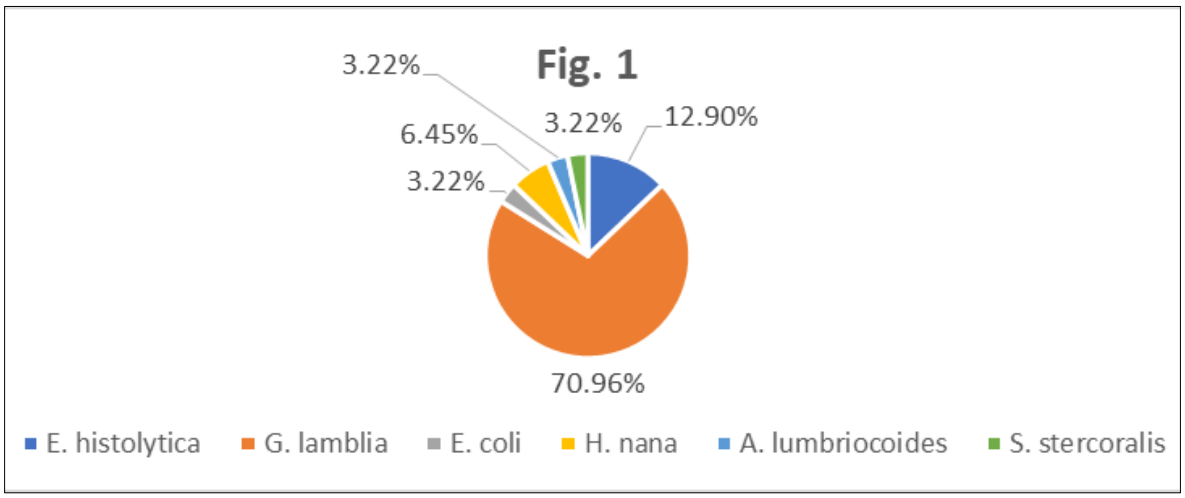

Figure 1 Different parasitic infections reported in our study

3.1 Statistical analysis

The Chi square test was used for determining the significance of association between intestinal parasitic infection and FOB test finding. A P-value level of significance was 0.05.

Table 1 Fecal occult blood results in parasitic infections

Parasitic infections	Fecal occult blood positive (38)	Fecal occult blood negative (121)
Negative (128)	24	104
Positive (31)	14	17

Table 2 Fecal occult blood results in relation with different parasitic infections

parasite	Positive fecal occult blood result	Negative fecal occult blood result	%age positive for fecal occult blood test
E. histolytica (n=4)	3	1	75%
E. coli (1)	1	0	100%
G. lamblia (22)	7	15	31.81%
H. nana (2)	1	1	50%
A.lumbricoides (1)	1	0	100%
S. stercoralis (1)	1	0	100%

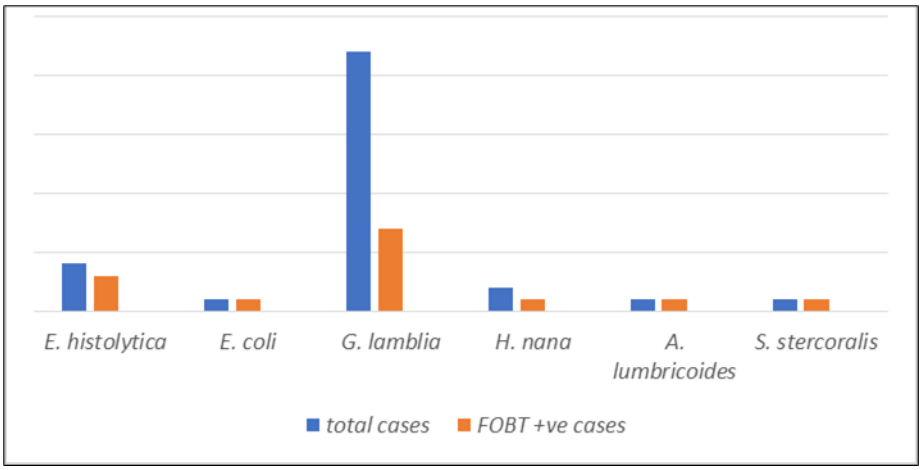

Figure 2 Comparison between total cases and FOBT positive cases of respective parasitic infections

4. Discussion

Our study included 159 samples of the patients who attended our hospital complaining of symptoms and signs that rose the suspicion that they might be suffering from gastrointestinal ailments. Those patients were inclusive of both sexes. They attended the different outpatient departments of JSSH, from there they were referred to microbiology department to get their stool specimen examined. Our result comprised of 31(19.49%) samples positive for different parasitic infections. Our result was very close if not similar to a study by a Ramadan *et al* reporting 13.7% samples positive for different parasitic infections. %).[11+]Low prevalence of intestinal parasitic infection in this study may be due to the method of selection of cases to be included, as they were selected randomly from the patients attending the outpatient department in the hospital.

Giardia lamblia was detected in maximum number of patients having parasitic infections (70.96%), second spot was occupied by *Entamoeba histolytica* (12.90%), then *Hymenolepis nana* (6.45%) and then *Entamoeba coli, Ascaris lumbricoides* and *Strongyloides stercoralis* were detected in equal number of positive samples (3.22%).

A study in a tertiary care centre in Bihar by *Rituparna B et al* reported *E. histolytica* leads the group covering 40.49% of all parasitosis cases. The second place was occupied by *Giardia lamblia* (24.44%). The next in order were *A. lumbricoides* (21.09%), *Enterobius vermicularis* (4.9%), *A. duodenale* (2.82%), *Hymenolepis nana* (2.3%), *Strongyloides stercoralis* (1.93%), *T. trichiura* (1.26%), and *Taenia* (0.74%).[12] A similar study by *Uppal B et al* in a tertiary care centre in New Delhi reported *Giardia intestinalis, Ascaris lumbricoides and Entamoeba histolytica* as the major parasitic pathogens (2.27%, 1.15% and 0.64% respectively) %).[13]

The spectrum of various parasitic infections as reported in a study by *Saurabh K et al* in a tertiary care centre in Rajasthan is that the most common protozoa isolated was *Entamoeba histolytica* (37.57%) followed by *Giardia*

lamblia (23.12%), and the most common helminth isolated was *Hymenolepis nana* (2.9%) followed by *Ascaris lumbricoides* (1.15%).%).[14]

The common parasites which were detected and can cause blood loss are *Entamoeba histolytica*, *Strongyloides stercoralis*, *Ascaris lumbricoides* can penetrate a wall already weakend by gangrene or an ulcer.

75% cases of *Entamoeba histolytica* in our study were positive for FOB. *Ramadan ME et al* and *Ugwuoke H et al* reported 50% cases positive for FOB. (11, 15)

Giardia lamblia infection is a non invasive one, as contrary to our study which reported FOB in 31.82% of Giardia lamblia positive samples. *Ramadan ME et al* and *Wakid MH et al* reported 0% cases positive for FOB. (11, 16) Blood loss in those patients can be explained with more intensive investigation leading to a different diagnosis causing blood loss, such as colorectal cancer or duodenal ulcer.

Our study reported 45.16% cases positive for FOBT out of the total parasitic infection positive cases which is very close to a study conducted by Ramadan et al that reported 47.1% FOBT . Our study findings also coincided with another study by *Ugwoke et al* that reported 46.2% FOBT positive parasitic infection cases. However, this was in contrast to a study by *Wakid MH et al* that reported only 22.43% of parasitic infected cases that were positive for FOBT.

5. Conclusion

Our study demonstrated a significantly high prevalence of FOBT positive cases. It is a low cost, easy to use, a test that demands not so high expertise and less time by the technician and the high correlation with intestinal parasitic infection as conceived in our study can advocate it's use and applicability in health care settings.

Compliance with ethical standards

Acknowledgments

The authors thank all the contributors for this study.

Disclosure of conflict of interest

No conflict of interests.

References

[1] Odu NN, Akujobi CO, Maxwell SN, Nte AR. Impact of mass deworming of school children in rural communities in Rivers State, Nigeria: option for programme sustainability. Acta Parasitologica. 2011;2:20-4.

[2] Mordi RM, Ngwodo PO. A study of blood and gastro-intestinal parasites in Edo state. African Journal of Biotechnology. 2007;6(19).

[3] Alli JA, Okonko IO, Kolade AF, Nwanze JC, Dada VK, Ogundele M. Prevalence of intestinal nematode infection among pregnant women attending antenatal clinic at the University College Hospital, Ibadan, Nigeria. Advances in Applied Science Research. 2011;2(4):1-3.

[4] Ahsan-ul-Wadood BA, Rhman A, Qasim K. Frequency of intestinal parasite infestation in Children Hospital Quetta. Pak J Med Res. 2005;44(2):87-.

[5] Patel MM, Patel PR, Gamit B, Modi J, Padsala S. Prevalence of intestinal parasites infestation in Surat city of South Gujarat: A hospital based study. Natl J Community Med. 2014;5(3):273-75.

[6] Sethi S, Sehgal R, Malla N, Dudey ML, Mahajan RC. Changing trends of intestinal parasitic infections in Chandigarh (NG): Hospital based study. Indian Journal of Medical Microbiology. 2000 Jul 1;18(3):106.

[7] Rao VG, Aggrawal MC, Yadav R, Das SK, Sahare LK, Bondley MK, Minocha RK. Intestinal parasitic infections, anaemia and undernutrition among tribal adolescents of Madhya Pradesh. Indian J Community Med. 2003 Jan 26;28(1):26-9.

[8] Kumar R, Biswas PP, Yasmin T, Sen A, Ganguly U. Prevalence of intestinal parasitic infections in patients attending a tertiary care hospital in Eastern Bihar. J Evol Med Dent Sci. 2014 Jun 16;3(24):6740-46.

[9] Patel JC. Ten year study of stool samples with particular reference to intestinal parasites. Journal of postgraduate medicine. 1986 Oct 1;32(4):219.

[10] Hegde GR, Patel JC. Prevalence of intestinal parasitic infestation in rural area. Journal of postgraduate medicine. 1986 Oct 1;32(4):225.

[11] Ramadan ME, Ramadan ME, Shafik M, Yousef M. The value of Faecal Occult Blood Test in patients infected with intestinal parasites.

[12] 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.

[13] Uppal B, Perween N, Aggarwal P, Kumar SK. A comparative study of bacterial and parasitic intestinal infections in India. Journal of clinical and diagnostic research: JCDR. 2015 Mar;9(3):DC01.

[14] Saurabh K, Nag VL, Dash S, Maurya AK, Hada V, Agrawal R, Narula H, Sharma A. Spectrum of parasitic infections in patients with diarrhoea attending a tertiary care hospital in Western Rajasthan, India. Journal of clinical and diagnostic research: JCDR. 2017 Aug;11(8):DC01.

[15] Ugwuoke H, Okonkwo B, Oshilonyah H, Pon SC, Rly JO. Faecal occult blood and intestinal parasites among patients attending outpatient clinic in Agbor, Delta State Nigeria. Archives of Biomedical Sciences and Health. 2013;1:20-8.

[16] Wakid MH. Fecal occult blood test and gastrointestinal parasitic infection. Journal of parasitology research. 2010;2010.