MERIT RESEARCH JOURNALS
www.meritresearchjournals.org

Merit Research Journal of Medicine and Medical Sciences (ISSN: 2354-323X) Vol. 11(2) pp. 034-039, February, 2023
Available online http://www.meritresearchjournals.org/mms/index.htm

DOI: 10.5281/zenodo.7653414

Original Research Article

Fecal Occult Blood Test for Gastrointestinal Parasitic Infection among Adult population Healthin Saudi Arabia, Jazan City

Ammar A. Abdelmola[1*], Ahmed Elimam[2], Mohamed Elfatih Abdelwadoud[3], Olla Rahmtallah[4], Sarra Kamal[5]

[1.2.4.5]Department of Medical Laboratory Technology, Faculty of Applied Medical Sciences, Jazan University-azan

[3]Faculty of Medical Laboratory Sciences, University of Medical Sciences and Technology -Sudan

***Corresponding Author's Email: aabdelmola@jazanu.edu.sa**
Phone: + 966 537194430

Abstract

Infections due to intestinal parasites are among the most adult population health problems , cause most prevalent infections in adult humans beings in developing countries. Faecal occult blood refers to blood in the faeces that is not visible to the naked eye and FOBT, as the name implies, is aimed to detect subtle blood loss in the gastrointestinal tract from the mouth to the colon. This study aimed to prove if there is a relation between FOB and intestinal parasites. Stool samples of 112adult patients from different cities of Jazan province south of the Kingdom of Saudi Arabia. Direct wet smear and faecal sedimentation method, Formal ether concentration technique (FECT), were used for the detection of the intestinal parasites. A commercially available immunological FOBT kit was used to detect FOB. The result showed that 8(7.2%) of studied cases were infected by parasitic infection, 4(3.6%) of them were positive for FOB. Parasites detected were Entamoeba histolytica and Giardialambelia. 2 (2.1%) of the studied male cases and 2(14.5%) of female cases were positive for FOBT. We concluded that this study demonstrated a slightly high prevalence positive FOBT, no association between intestinal parasitic infection or sex and positive FOBT, although a significant relation was present between age and positive FOBT. We recommend that FOBT, due to its low-cost and ease of use, we advocate for the immediate integration of FOBT as a tool in as routine tests in clinics and hospitals especially for old aged patients, further studies should be done for detection of correlation between other intestinal parasitic infection and FOB.

Keywords: FOBT (Faecal Occult Blood), Formal ether concentration technique (FECT), Intestinal parasites

INTRODUCTION

The mortality due to parasitic diseases cause retard social and economic development in low-income countries (CDC, 1997). About one third of the world (more than two billion people) is infected with intestinal parasites (Chan, 1997). About 39 million disability adjusted life years (DALYs) are attributed to intestinal parasitic infection (IPI) and thus represents a substantial economic burden due to these infections (WHO, 2008). The burden due to schistosomiasis (mainly Schistosoma mansoni S. haematobium and S. japonicum) is estimated at 4.5 million DALYs (WHO, 2002 and Hotez et al., 2006). Amoebiasis due to infections with the intestinal protozoon Entamoeba histolytica results in 40,000–100,000 deaths each year (Stanley, 2003), and giardiasis due to Giardia intestinalis might affect 200 million people per annum (Minenoa and Avery, 2003). Symptoms of parasitic

infection include abdominal pain, dizziness, fever, nausea, diarrhoea, hair loss, etc.... (Raj, 1999). Faecal occult blood (FOB), (Mitchell et al., 2004), which refers to cryptic blood in faeces, has been used for a number of years as a marker of intestinal pathologic changes, particularly in association with colorectal cancer. A number of point-of-care tests have been developed (Hewitson et al., 2008; Wu et al., 2009; Jenkinson and Steele, 2010) and as such, they are simple to use and provide a result in minutes. There are various causes of positive FOB including infection with some intestinal parasites (Beg et al., 2002). FOB has also been used for identifying blood loss in parasitic enteric infections with hookworm, Trichuristrichiura or Entamoeba histolytica (Stoltzfus et al., 1996; Raj, 1999; Okamoto et al., 2005, Wanachiwanawin et al., 2005). The objective of this study was to prove if there is a relationship between the results of FOB test and intestinal parasitic infection.

METHODOLOGY

Study area

Study was conducted within different cities of Jazan province south of the Kingdom of Saudi Arabia.

Study design

Cross-sectional descriptive study which was carried out between April 2021 and October 2022 among 112 participants men and women aged 18 years and above in Jazan province south of the Kingdom of Saudi Arabia.

Sampling design

Stool samples were obtained randomly from 112 participants. Each was provided with a clean stool container and instructions for collection. Stool specimens were collected in a clean, wide mouthed containers with a tightly fitted lid and the time of collection was recorded on the container, which was properly labeled.

Sample size calculation

Sample size calculation according to Fischer's formula .The minimum sample size for the study was calculated using the following formula given by Fischer (Nigel et al., 2008) n = required sample size for this study. Z = Critical value from standard normal table. For a 95% CI, z=1.96 p = expected prevalence of infection with T.gondii in this case is 50% or 0.5 q = 1-p (probability of no event) = margin of error at 5% (standard value of 0.05) 12 samples were included .

Sample Collection and Processing

This study was carried out on 112 patients from different cities of Jazan province, Saudi Arabia. Three specimen containers were given to each subject for giving stool samples for three consecutive days and the procedure for introduction of stool specimens into the containers was carefully explained to them. Stool were labelled before processing. For each stool sample, two slides were examined for the detection of parasites by two investigators using optical microscopy with oil immersion objective (Nikon, Japan) at 100X and 400X magnifications. Most Samples were processed immediately and examined, others were stored at 4ºC without a preservative solution according to the protocol described by Oliveira et al. (2002).

Parasitological examination

2.1 Direct smear: Procedure
A portion each of the stool samples was processed with a direct microscopic technique to detect cysts, trophozoites, eggs and larva of intestinal parasites immediately according to (WHO,1991).
2.2 The spontaneous faecal Formal Ether sedimentation Concentration technique (Hoffman et al., 1934). In this method, faecal samples are diluted in 10% formal saline and filtered through a gauze strip into a conical sedimentation glass , then ether solution is added to clear the parasites from fecal matters
This method was used to detect the presence of helminthes eggs and larvae and protozoa cysts. This technique is widely used in epidemiological studies, due to its low cost.
3-Simple chromatographic test was employed for FOB detection (Mission Test H, Acon Laboratories, San Diego, CA), following the manufacturer's instruction, a small amount of feces was homogenised in a liquid buffer after collection. Two drops of stool suspension were applied to a test cassette and results were visually read after five minutes and categorized as negative (-), trace (+/-) and positive (+).
4-Statistical Analysis. Data analysis was performed using SPSS statistic PackageV17.0. The Chi square test was used. A P-value level of significance was 0.05.

RESULTS AND DISCUSSION

Several coprologic techniques have been utilized in parasitic disease diagnostic tests; in this research work we used direct smear and the Formal Ether sedimentation Concentration Technique to detect intestinal parasitic infection in stool samples. Formal Ether sedimentation Concentration Technique is widely used in epidemiological studies, due to its low cost. It had

Table 1. Positive fecal occult blood in relation to the sex of the participant

No	Sex	No	FOB -ve	FOB +ve
1	Male	98	96	2
2	Female	14	12	2
3	Total	112	108	4

The positive FOB test was observed in 2 (2%) out of 98 male participants and 2 (14%) out of 14 female participants.

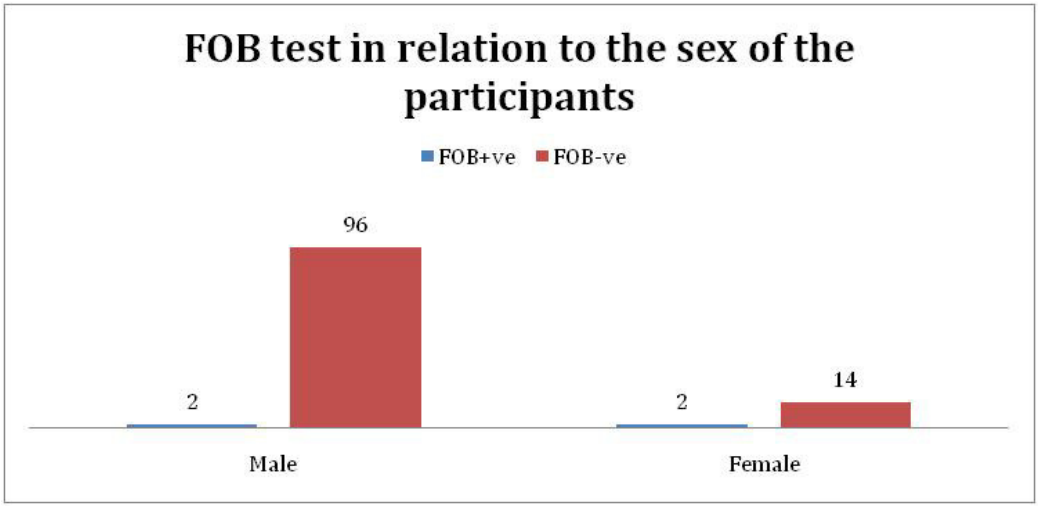

Table 2. Positive fecal occult blood in relation to the age of the participant

No	Gender	Age	City	FOB
N5	Female	60	Abo Arish	Positive
N24	Male	20	Jazan	Positive
N47	Male	25	King Abdullah Housing	Positive
N102	Female	24	Jazan	Positive

The positive FOB test was observed in age (20) and (25) in male participants and (60) & (24) in female participants out of the total 4 positive FOB test samples .

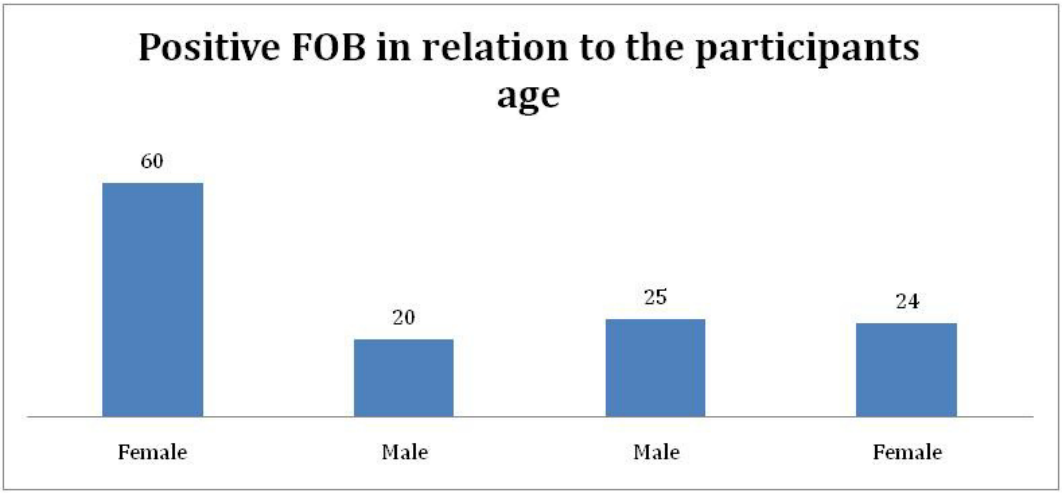

Table 3. Positive fecal occult blood in relation to the Geographical distribution in Jazan Province

No	Area	FOB -ve	FOB +ve	Total
1	Abo Arish	18	1	19
2	Aldarb	19	0	19
3	Samtah	16	0	16
4	Jazan	24	2	26
5	Baish	15	0	15
6	King Abdullah Housing	16	1	17
	Total	108	4	112

The positive FOB test was observed in 2 positive samples in Jazan (50%) , 1 positive samples (25 %) AboArish and 1 positive samples (25 %) in King Abdullah Housing of the total 4 positive FOB test samples .

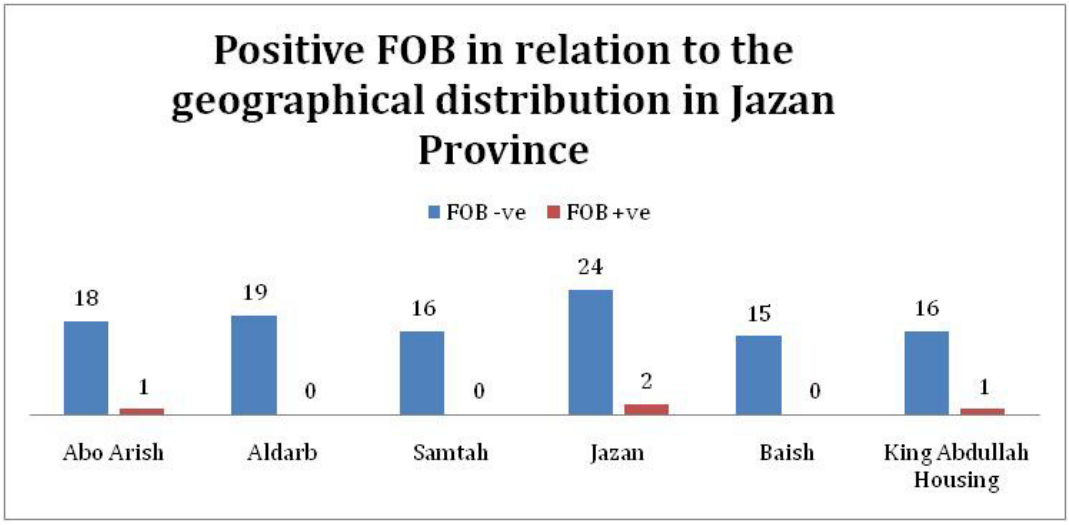

Table 4. Fecal occult blood positivity in parasitic infected and non-infected samples.

FOB Test	Positive Parasitic infection (n=0)	Negative Parasitic infection (n=112)
Positive FOB	0	4(3.6%)
Negative FOB	8(7.2%)	108 (96.4%)

FOB test was positive in 4 sample (3.6%) of whole samples (112) and 108 (96.4%) samples were negative for FOB.

Table 5. The results obtained by direct wet mount method and centrifugal sedimentation method.

FOB Test	Positive Parasitic infection (n=0)	Negative Parasitic infection (n=112)
Positive FOB	0	4(3.6%)
Negative FOB	8(7.2%)	108 (96.4%)

8 cases of intestinal parasitic infections observed in both direct wet mount and Centrifugal Sedimentation methods.

a higher positivity rate for hookworm (Cerqueira et al., 2007). This method had high positivity rates compared to other methods for the detection of parasite larvae (De Carvalho et al., 2012).

Faecal occult blood test (FOBT) is used in the screening and monitoring of patients with gastrointestinal disorders (Gisbert et al., 1997). Annual or biennial faecal occult screening has been shown to significantly reduce the incidence of colorectal cancer (Gregor, 1971). The process of FOBT in the past has been time consuming and aesthetically offensive to laboratory staff (Guittet et al., 2009). The advantages of the guaiac-based faecal occult blood (FOB) tests are their relatively low cost, easy to use with very little technical expertise (Beg et al., 2002).

In (Table 1) The positive FOB test was observed in 2 (2%) out of 98 male participants and 2 (14%) out of 14 female participants. It was low percentage compared with waked, (2010) and Nmorsi et al. (2009) as they reported (47.01%) and (94.3%) respectively .This low percentage also detected in an earlier studies done by Omorodion et al. (2012) and Ugwuoke et al. (2013) as they documented an overall prevalence of 12.3% and 13% respectively.

In (Table 2) The positive FOB test was observed in 2 positive samples in Jazan (50%), 1 positive samples (25 %) AboArish and 1 positive samples (25 %) in King Abdullah Housing of the total 4 positive FOB test samples. This was agreed by some authors (Wakid, 2010; Ugwuoke et al., 2013).

In (Table 3) The positive FOB test was observed in 2 positive samples in Jazan (50%), 1 positive samples (25 %) Abo Arish and 1 positive samples (25 %) in King Abdullah Housing of the total 4 positive FOB test samples).

In (Table 4) FOB test was positive in 4 sample (3.6%) of whole samples (112) and 108in 8 (96.4%)samples were negative for FOB. In contrast with other research (Wakid, 2010) that reported (22.43%) of parasitic infected cases and (25.91%) of non-infected were positive for FOBT.

In (Table 5) No intestinal parasitic infections observed in both direct wet mount and Centrifugal Sedimentation method. In the whole samples examined (112 specimens) which may be due to the good living standard in which the participants are living in, with high standard personal hygiene and self-cleanliness. Low prevalence of intestinal parasitic infection in this study may be due to the method of selection of cases to be included, as we selected them randomly from relatives, neighbors and colleagues who are not feeling any illness and not attending clinics or hospitals).

Even though the FOB test was developed to specifically screen for colon cancer (Wu et al., 2009; Jenkinson and Steele, 2010), but indeed there are various causes of positive FOB including infection with some intestinal parasites (Mitchell et al., 2004; Khuroo et al., 2010). In this study 4 (3.6%) stool samples showed positive FOB test out of total 112 stool samples . stool samples showed no parasitic infection. Our results cannot asses and correlate the positive FOB test with the intestinal parasitic infection .

CONCLUSION

Provide SMART conclusion

The present study demonstrated that positive FOB test during routine analysis cannot be correlated with the intestinal parasitic infections. We recommend that FOBT, due to its low-cost and ease of use, we advocate for the immediate integration of FOBT as a tool in as routine tests in clinics and hospitals especially for old aged patients ,further studies should be done for detection of correlation between other intestinal parasitic infection and FOB .

REFERENCES

20.World Health Organization: Basic laboratory methods in medical parasitology. Geneva, Switzerland: WHO; 1991::32.

Beg M., M. Singh, M. K. Saraswat, and B. B. Rewari (2002). “Occult gastrointestinal bleeding: detection, interpretation and evaluation,” *J. Indian Acad. Clin. Med.* vol. 3, no. 2, pp. 153–158, View at: Google Scholar

Cerqueira, E.J.L, Arcanjo, M.S.&Alcântara, L.M.(2007). Análise-comparativa da sensibilidade da técnica de Willis no diagnósticoparasitológico da ancilostomíase. DialogosCienc 5: 1-7.

De Carvalho,G.L.X., Moreir,L.E.,Pena, J.L.,Marinho, C.C.,Bahia, M.T. and Coelho, G.L.L.M.(2012).A comparative study of the TF-Test®,Kato-Katz, Hoffman- Pons- Janer, Willis and Baermann-Moraes:Coprologic methods for the detection of human parasitosis. MemInst Oswaldo Cruz,107(1)80-84.

Ekpenyong E (2008). Prevalence of intestinal helminths infections among schooling children in Tropical Semi Urban Communities. Anim Res Int, 5: 804- 810

Gisbert JP, Boixeda D, Martin de Argila C, Alvarez Baleriola, I, Abraira V, Garcia Plaza A (1997). Unhealed duodenal ulcers despite Helicobacter pylori eradication Scand J Gastroenterol, 32: 643–50.

Gregor DH (1971). Occult Blood Testing for Detection of asymptomatic Colon cancer, Cancer, 28, 131.

Guittet L, Bouvier V, Mariotte N, Vallee JP, Levillain R, et al., (2009): Comparison of a guaiac and an immunochemical faecal occult blood test for the detection of colonic lesions according to lesion type and location. Br J Cancer 100: 1230–1235.

infections. Adv. Parasitol., 73: 197-230. https://doi.org/ 10. 1016 /S0065-308X(10)73008-6.

Jamaiah I, Rohela M (2008). Prevalence of intestinal parasites among members of the Public in Kuala Lumpur, Malaysia. Southeast Asian J Trop Med Public Health, 36: 68-71

Jenkinson F, R. J. C. Steele (2010). “Colorectal cancer screening—methodology,” *Surgeon*, vol. 8, no. 3, pp. 164–171, View at: Publisher Site | Google Scholar

Keiser J, Utzinger J (2010). The drugs we have and the drugs we need against major helminth

Khuroo MS, MS Khuroo, NS Khuroo (2010). "*Trichuris* dysentery syndrome: a common cause of chronic iron deficiency anemia in adults in an endemic area (with videos)," *Gastrointestinal Endoscopy*, vol. 71, no. 1, pp. 200–204, View at: Publisher Site | Google Scholar

Majed H. Wakid (2010). Fecal Occult Blood Test and Gastrointestinal Parasitic Infection, Hindawi Publishing Corporation J. Parasitol. Res. Volume Article ID 434801, 4 pages. doi:10.1155/ 2010/ 434801.

Mamoun MM, Abubakr IA, ElMuntasir TS (2009). Frequency of intestinal parasitic infections among displaced children in Kassala Town. Khar- toum Med. J. 2 (1), 175-177

Manar Ezzelarab Ramadan, Mohamed EzzElarab Ramadan, Mervat Shafik Mohamed Yousef, The value of Faecal (2014). Occult Blood Test in patients infected with intestinal parasites, Multi Disciplinary Edu Global Quest (Quarterly), Volume 3, Issue 3#11, July

Mitchell SH, DC Schaefer, S. Dubagunta (2004). "A new view of occult and obscure gastrointestinal bleeding," *American Family Physician*, vol. 69, no. 4, pp. 875–881, View at: Google Scholar

Okamoto M., T. Kawabe, K. Ohata et al., (2005). "Short report: amebic colitis in asymptomatic subjects with positive fecal occult blood test results: clinical features different from symptomatic cases," *Ame. J. Trop. Med. Hygiene*, vol. 73, no. 5, pp. 934–935, View at: Google Scholar.

Salem Ramadan Sariti1, Nouara Emrajae El-ammari, Fathiya AA Asteal (2015), Positive Fecal Occult Blood Test In Correlation With Intestinal Parasitic Infections, MMSJ Vol.2 Issue.2 (Winter 2015) www.misuratau.edu.ly

Savioli L, Bundy D, Tomkins A (1992). Intestinal parasitic infections: a soluble public health problem. Trans. R. Soc. trop. Med. Hyg., 86: 353-354. https://doi.org/10.1016/0035-9203(92)90215-X1.

Wakid MH (2010). Faecal occult blood test and gastrointestinal parasitic infection journal of parasitology Research,10 id 434801.

Wanachiwanawin D, S. Wongkamchai, S. Loymek et al., (2005). "Determination of fecal occult blood in primary schoolchildren infected with *Trichuristrichiura*," *Southeast Asian . Trop. Med. Public Health*, vol. 36, no. 5, pp. 1110–1113, View at: Google Scholar

Wu D, D. Erwin, and GL Rosner (2009). "A projection of benefits due to fecal occult blood test for colorectal cancer," *Cancer Epidemiology*, vol. 33, no. 3-4, pp. 212–215, View at: Publisher Site | Google Scholar