



ORIGINAL ARTICLE

Audit of stool analysis results to ensure the prevalence of common types of intestinal parasites in Riyadh region, Saudi Arabia

A.M. Eligail *, A.M. Masawi, N.M. Al-Jaser, K.A. Abdelrahman, A.H. Shah

Department of Parasitology, Central Laboratories, Directorate General of Laboratories and Blood Banks, King Saud Medical Complex, Ministry of Health, P.O. Box 59082, Riyadh 11525, Saudi Arabia

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Abstract The objective of the current study was to determine the incidence of common types of parasites encountered in the Central Region of Saudi Arabia. The current study is a retrospective study which includes the results of 10427 stool sample and occult blood sample. The results obtained during last two years (2005–2007), were compared to the earlier reports on parasites in the Central as well as other regions of Saudi Arabia. Attempts were made to find out the cases of increasing and/or decreasing trend of parasite incidence and to locate any differences between the current study results and the earlier reports.

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1. Introduction

Stool analysis is a common laboratory test used to screen for parasites in cases of diarrhea and other gastrointestinal disorders. Sometimes the test is used to confirm the presence of a specific parasites related to a specific clinical situation like the *Schistosoma* parasite in cases of hepatosplenomegaly or hook worm parasite in case of iron deficiency anaemia

(WHO, 1991; Kochhar, 2004; Halton et al., 2005). The parasites seen in a stool specimen usually include either: *Protozoa trophozoites* and/or cysts. Complete worms or segments of a *Taenia* worm can also be seen (Cox, 1993; Panjarathinam, 2007). However, in cases of *Strongyloides stercoralis* worms ova or larvae are known to be present (Iqbal, 2008). 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.

A report on stool analysis of male immigrant manual workers in Saudi Arabia, suggested that nine out of ten patients suffered from human fascioliasis (Haseeb et al., 2002; Sanad and Al-Megrin, 2005). However, fascioliasis, caused by *Fasciola species*, is actually a disease of herbivorous animals and occasionally found in human (Haseeb et al., 2002). All patients of fascioliasis presented established clinical features and showed anaemia and eosinophilia. Several studies conducted on stool smear stained with eosin, iodine and Zehl-Nelson stains, further showed the presence of *Entamoeba histolytica*,

* Corresponding author.

E-mail address: abugailmak@hotmail.com (A.M. Eligail).



Entamoeba coli, *Giardia lamblia* and *Cryptosporidium parvum* (Abdel-Hafez et al., 1986; Zakai, 2004; El-Mathal and Fouad, 2005). Abdominal pain and pruritus ani were the most common causes of referral in the patient group and *G. Lamblia* was found to be among the most common pathogenic parasite (Ahmed and El-Hady, 1989).

In young male and female students of Riyadh region (Saudi Arabia) different other intestinal parasites were found including: *Ascaris lumbricoides*, *Trichuris trichiura*, *Schistosoma mansoni*, *Hymenolepis nana*, *Ancylostoma duodenale*, *Enterobius vermicularis*, *Taenia saginata* and *Schistosoma hematotium* (Abdel-Hafez et al., 1986).

In the present study, the prevalence of common types of intestinal parasites encountered in Riyadh region was determined. The results were compared with earlier reports from the same region and other regions of Saudi Arabia to observe any current changes in the pattern of parasitic intestinal infection, in Riyadh.

2. Materials and methods

A total of 10,427 samples received during the period 10/2/2005–16/1/2007 in the Department of Parasitology, Central Laboratory, King Saud Medical Complex (KSMC), Ministry of Health (M.O.H.), Riyadh were included in the current study. The sample specimens were mainly received from Riyadh Medical Complex which is a 1500 bedded tertiary care hospital. Other specimens received were from Riyadh Medical Health Centres, M.O.H, and samples of the food handlers taken during pre-employment medical check up by Riyadh Municipality. However, Riyadh Municipality specimens were sent for reference and confirmation of the findings of their own laboratory results. The sources and number of the specimens received is shown in Table 1. Some of the specimens were rejected and not examined due to certain reasons and the details about such samples are given in Table 2.

The analysis of all the samples was carried out by following the World Health Organization protocol for physical and microscopic examination with minor modifications (WHO, 1991, 2004). Faecal smears are prepared in saline, eosin and iodine and examined directly. In special cases including the specimens from Riyadh Municipality Laboratory, a formol saline concentration was used prior to microscopic examination. Occult blood was tested by following the instructions and procedures given by the manufacturers as shown in the inserted leaflet of whatever available kit. All records were maintained

Table 1 The sources, number and percent of the specimens received.

Sources of the specimens received	Number and percent of the specimens
Riyadh Central Laboratory Collection Room (CR)	8621 (82.68%)
King Saud Medical Complex	1153 (11.06%)
Riyadh Central Laboratory	417 (4.00%)
Riyadh Municipality Laboratory	104 (1.00%)
Other sources ^a	132 (1.27%)
Total	10,427 (100%)

^a Including Health Care and Rehabilitation Centres.

Table 2 The number of stool sample rejected and the reasons for rejections.

Reason for rejection	Number rejected
No laboratory number on the container label	1 (2.70%)
No sample in the container (empty container)	5 (13.51%)
Request form received without a sample	21 (56.76%)
Contaminated samples	1 (2.70%)
The laboratory number on the container and request form are not the same	2 (5.41%)
Two samples received with the same laboratory number	2 (5.41%)
Wrong sample urine was received instead of stool	5 (13.51%)
Total	37 (100%)

Table 3 The results of the parasitological analysis of the specimens received.

The Parasite identified	Number
<i>Entamoeba coli</i>	403 (4.08%)
<i>Iodamoeb buetschlii</i>	177 (1.79%)
<i>Indolimax nana</i>	173 (1.75%)
<i>Ascaris</i>	66 (0.67%)
<i>Giardia lamblia</i>	66 (0.67%)
<i>Chilomastix mesnili</i>	40 (0.41%)
Hook worm	36 (0.36%)
<i>Trichuris trichuria</i>	36 (0.36%)
<i>Entamoeba histolytica</i>	14 (0.14%)
<i>Hymenolpis nana</i>	10 (0.10%)
<i>Strongyloides larva</i>	7 (0.07%)
<i>Trichomonas hominis</i>	6 (0.06%)
<i>Schistosoma mansoni</i>	4 (0.04%)
<i>Balantidium coli</i>	4 (0.04%)
<i>Enterobius vermicularis</i>	2 (0.02%)
<i>Taenia</i> species	1 (0.01%)

in a local computer system. The results were analyzed by using Microsoft Excel and Access programmes together with SPSS version 13.0. on personal computer.

3. Results

A total of 37 specimens out of 10,427 stool specimens received were rejected mainly due to mistakes including improper sampling, contaminations, wrong labels, and wrong numbering (Table 2). The results of the parasitological analysis of the specimens received are depicted in (Table 3).

The specimens tested for the presence of parasites were 9869 in number while 271 specimens were tested both for parasites and occult blood. On the other hand, 521 specimens were tested only for occult blood. In the specimens tested for parasites, the parasites found were pathogenic and/or non-pathogenic intestinal parasites.

It is worth mentioning that among the specimens tested, 167 samples were loose stools samples. In 45 (27%) of such samples, only blood and mucous were found, otherwise all the samples were devoid of parasites.

Among the specimens tested for occult blood 154 (19.4%) were found to be positive for occult blood, while 44 (5.6%) were slightly positive for occult blood (Table 4).

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