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Detection and Prevalence Intestinal Parasites in Patients in Abeokuta, South-western, Nigeria

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Abstract: This study reports on detection and prevalence of intestinal parasites in patients in Abeokuta, the capital city of Ogun State located in the forest zone of southwestern Nigeria. Stool samples were collected from 2215(100.0%) patients; 1485(67.0%) males and 730(33.0%) females. Microscopic examination of both thin and thick films techniques were employed for this study. Of the 2215 (100%) stool specimens examined, parasites positive-slides were 147(6.6%). The overall prevalence was 6.6% and mostly in females (7.1%) than in males (6.4%). More parasites were detected in stool samples collected in 2002 [59(23.6%)] than other years studied, there was also significant difference in the years under study (P=0.05). The parasites include: *Ascaris lumbricoides* [57(38.8%)] and *Schistosoma mansoni* [4(2.7%)] and trophozoites/cysts of *Entamoeba histolytica* [76(51.7%)]. There were cases of multiple infection of *Ascaris lumbricoides* and *E. histolytica* [10(6.9%)]. There was higher incidence of the cyst of *E. histolytica* (51.7%) than other parasitic worms observed in this study and a low incidence of *S. mansoni* (2.7%). This study shows that a good percentage of people were infested by parasitic protozoa and worms and re-enforces the need for an urgent effort to check the unnecessary and avoidable heavy parasites load.

Key words: Cysts · Eggs · Trophozoites · Parasite loads · Prevalence level

INTRODUCTION

Some intestinal nematodes such as *Ascaris lumbricoides*, *Trichuris trichuria, Enterobius vermicularis, Ancyclostomidae duodenale, Necator americanus, Strongyloides stercoralis* and some species of *Schistosoma* as well as *Entamoeba histolytica* have been incriminated as the major cause of appendicitis. They are large intestinal worms of man and are by far known to be the most widespread and commonest parasites of man in tropical Africa [1-3]. Their eggs are resistant to adverse conditions of low temperature, desiccation and strong chemicals and can remain viable for several years [2,3]. These worms have been found to clogging the appendix which leads to complication "appendicitis" caused by migrating worms [1-3,4]. *Enterobius vermicularis* (pinworms or threadworms) is also referred to as one of the most common nematode parasites of man which flourish in the temperate zones where 'probably every child has been infected not once, but many times in early childhood'. It has a worldwide distribution with children being more commonly infected than adults [3].

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This study therefore, reports on detection and prevalence of intestinal parasites in patients in Abeokuta, the capital city of Ogun State located in the forest zone of southwestern Nigeria. It also aimed at determining the extent to which these intestinal parasites were involved in the causation of acute diseases in an African set up.

MATERIALS AND METHODS

Ethical Approval: The samples were obtained by informed consent of the patients used for this study and the permission to that effect was obtained from the ethical committee.

Samples Collection: Stool specimens were collected from 2215 patients attending Health Services Department, University of Agriculture, Abeokuta, South-western, Nigeria. The specimens were collected in sterile containers and transported to the laboratory.

Methodology: The stool specimens were collected using the sterile specimen bottles. These were taken to the laboratory where the slides were prepared as described by the method of Sood [5] and Baker *et al.* [6]. The prepared slides were stained haematoxylin stain and counterstained with eosin stain. After the staining, the slides were covered with cover slips. They were then viewed under the microscope at x10 to x40 objectives lens.

Identification: Positive specimens were identified on the basis of microscopy. Using standard methods [7], a trained laboratory technician at UNAAB Health Services Department interpreted the stool specimen slides. Prevalence of parasites load and infection was calculated as the proportion of sampled persons with a positive result divided by the number of persons who provided stool specimen. All point estimates were weighted, with empirically estimated standard errors used to account for prevalence.

RESULTS

A total of 1215 patients from different households in different communities and locations were enrolled in the study. Microscopy at UNAAB Health Services Department identified 147 (6.7%) infections by parasitic worms and protozoa among the 1215 (100.0%) patients who had provided a stool specimen. The parasitic worms and protozoa load of these 1215 stool specimens collected from patients in this study with parasites-positive and -negative slides are shown in Table 1. Table 1 shows the parasites load of the patients in Abeokuta, Nigeria from 2002-2004. This study shows 59(23.6%) cases of parasitic worms and protozoa load among the subjects in 2002; 54(3.0%) cases in 2003 and 34(22.1%) in 2004 (Table 1).

Table 1: Parasites Load among Patients in Abeokuta from 2002- 2004

	No. Tested (%)			
Year	Total No.	No. Males	No. Females	No. Positive (%)
2002	250(11.3)	186(74.4)	64(25.6)	59(23.6)**
2003	1811(81.8)	1202(66.4)	609(33.6)	54(3.0)**
2004	154(6.9)	97(63.0)	57(37.0)	34(22.1)**
Total	2215(100.0)	1485(67.0)	730(33.0)	147(6.6)

Key: ** = There was significant difference (P=0.05) between years under study

Table 2: Frequency of occurrence of trophozoites/eggs/cysts of parasites among patients with appendicitis

Parasites	No. (%)
Entamoeba histolytica	76(51.7)
Ascaris lumbricoides	57(38.8)
Schistosoma mansoni	4(2.7)
Mixed infections of *Ascaris lumbricoides* and *Entamoeba histolytica*	10(6.9)
Total	147(100.0)

Table 3: Distribution of Parasites Load between Genders of Patients in Abeokuta from 2002- 2004

	No. Tested			
Year	Total No. Positive (%)	No. Males (%)	No. Females (%)	No. Positive (%)
2002	250	59(23.6)	39(66.1)	20(33.9)
2003	1811	54(3.0)	38(70.4)	16(29.6)
2004	154	34(22.1)	18(52.9)	16(47.1)
Total	2215	147(6.6)	95(64.6)	52(35.4)

Key: ** = There was no significant difference (P=0.05) between genders of patients under study

Table 4: Prevalence of Parasites Load between Genders of Patients in Abeokuta from 2002- 2004

	Overall		Males		Females	
Year	No. Tested	No. Positive (%)	No. Tested	No. Positive (%)	No. Tested	No. Positive (%)
2002	250	59(23.6)	186	39(21.0)	64	20(31.3)
2003	1811	54(3.0)	1202	38(3.2)	609	16(2.6)
2004	154	34(22.1)	97	18(18.6)	57	16(28.1)
Total	2215	147(6.6)	1485	95(6.4)	730	52(7.1)

Key: ** = There was no significant difference (P=0.05) between genders of patients under study

Table 2 shows the frequency of occurrence of the eggs/cysts of parasites among patients with appendicitis. The eggs/cysts of some parasites were detected and evaluated among patients under study. These parasites include eggs of *Ascaris lumbricoides* and *Schistosoma mansoni* and cysts of *Entamoeba histolytica*. The result shows that cysts of *Entamoeba histolytica* had the highest frequency of occurrence 76(51.7%), followed by eggs of *Ascaris lumbricoides* 57(38.8%) and mixed infection of *Ascaris lumbricoides* and *Entamoeba histolytica* 10(6.9%). *Schistosoma mansoni* 4(2.7%) had the lowest incidence (Table 2).

Table 3 shows the distribution of parasitic infections in relation to gender (sex) of patients from 2002 to 2004. Nine 9(75%) males and 12(75%) females had ova/cysts of parasites (Table 3). The distribution of the parasites-positive slides of the 147 (6.6%) positive subjects is shown in Table 3; of which 95(64.6%) of the male subjects tested had parasites-positive slides and 52(35.4%) of the female subjects had parasites-positive slides (Table 3).

Table 4 shows the prevalence of parasitic infections in relation to gender (sex) of patients from 2002 to 2004. The results show an overall prevalence of 6.6% and a male prevalence of 6.4% while the female prevalence is 7.1% (Table 4).

DISCUSSION

Results from the study show the overall prevalence of parasitic infection and loads from 2002-2004 to be 6.6% in this area of Abeokuta, Southwestern, Nigeria. This differs from the overall prevalence of 75% reported ina study by Okolie *et al*. [3] among patients with appendicitis. This study also showed that parasite load from 2002 to 2004 was higher in females (7.1%) than in males (6.4%). In this study, the eggs of parasitic worms and cysts of *Entamoeba histolytica* were detected in 147 patients. This finding compares favorably and correlates with previous studies by Okolie *et al.* [3].

Also, in this study, among the stool specimens studied from 2215 patients, the eggs of *Ascaris lumbricoides*, *Schistosoma mansoni* and cysts of *Entamoeba histolyitica* were identified in 147 specimens. In 10 stool specimens, the eggs of *Ascaris lumbricoides* and cysts of *Entamoeba histolytica* were found to co-exist. In 2068 specimens, no parasitic eggs or cysts were found. This showed that the most intestinal disorder was precipitated by parasitic worms and protozoa. Some of these parasites especially the adult worms or eggs of *Ascaris lumbricoides*, *Schistosoma mansoni* and trophozoites/cysts of *Entamoeba histolyitica* (cysts) can accidentally enter the appendix, for unknown reasons, sometimes nest in the appendicular lumen where they at times cause reactions that can result in appendicitis. The results and findings of this study are not different from the foregoing observation [3].

There were cases of mixed infections were observed in this study, in which *Ascaris lumbricoides* and *Entamoeba histolytica* co-existed. This compares favourably with previous studies [3]. In most of the surveys in tropical Africa, it has been shown that mixed or multiple infection with intestinal nematodes is very common, such that cases of multiple infections with nematodes (Ascaris, hookworms and Trichuris); flatworms (*Schistosoma mansoni* and *Taenia saginata*); and protozoa (*Entamoeba histolytica* and *Giardia duodenalis*) have been reported [2-4,8]. Kionti [9] reported that the combination of Ascaris and hookworm, Ascaris and Trichuris, Ascaris, hookworm and Trichuris accounted for more than 76% of all multiple infections in school children in the Kano plain in Kenya [3].

Discrepancies observed in the findings of this study and previous studies by other researchers and could be attributed to differences in place of study i.e. geographical location and other conditions which can affect the research finding so that slight discrepancies c ould occur. The findings of this study also revealed that there was higher incidence of *Entamoeba histolytica* with 51.7% and low incidence of *Schistosoma mansoni* with 2.7%. It has also been suggested that the increasing parasite eggs/cysts can be traced back to heavy worm load in the body organs-intestine and other tissues [1-3].

In response to these high incidences, World Health Organization (WHO) has outlined strategies to combat the problem of parasitism. In this regards, the current deworming programme by some agencies and NGOs should be cost effectiveness and use of potent but safe anti-helminthic drugs. Measures directed at ensuring that heavy parasite infestations in humans are reduced include: 1) maintaining high standards of personal and domestic hygiene. 2) Avoiding contact with contaminated water, food and clothing. 3) High standard of education and adequate health education and 4) Presence of modern public restaurants hygienically kept and maintained [2-3].

There are a lot of literature on the reason for high prevalence of parasitic and worms (helminthic) infections in tropical Africa and none more succinct and eloquent than Cowper's [4] comment which states that a child born in a Nigerian village is almost bombarded by parasitic worms from soon after birth throughout life. In both rural and urban environments, the water used for drinking and domestic purposes is a source of schistosomaisis and guineaworm, the food both vegetables and meat, could be a source of tapeworm, roundworm and whipworm and also lung fluke where fresh water crustacean are consumed; the soil on which children walks barefooted infects them with hookworm and strongyloides and the profusion of biting insects with onchocereciasis and filaririasis. Non-biting insects, dogs, cats, goats and poultry in the houses and yards assist the mechanical spread of intestinal helminthes and the use of human night soil as manure increases the risk [3]. It is little wonder, therefore, that the prevalence of these intestinal helminthes and the average worm burdens have not shown any appreciable decrease from the estimates in the much quoted paper, 'This wormy world' by Stoll [10].

As evident in the findings of this study, 147 out of 2215 stool specimen from patients under study revealed one parasitic eggs/cysts or the other. These observations should re-enforce the need for an urgent effort to be made in order to monitor the unnecessary and avoidable heavy parasitic worm or protozoa infestation before the body becomes laden with these parasites and their eggs/cysts which may result to health and life-threatening infestation. If deworming is carried out to its logical conclusion, heavy parasitism will be avoided [3].

This study revealed that both male and female subjects had the same parasite eggs/cysts load in the same range of 6.4% and 7.1% respectively. This suggests that both males and females are equally exposed to parasitic infection and gender may not necessarily be an important epidemiological determinant for parasites loads. There is no significant difference between males and females tested (P=0.05). This implies that the level of parasitic infection (parasite load among patients tested is the same regardless of gender.

Concluding from the foregoing pieces of information, it is clear that there is urgent need for de-worming i.e. reducing the worm load in the body system. This is because if one is de-wormed at intervals, there is the possibility of killing most worms/protozoa present in the intestine before they cause heavy infestation leading to severe health consequences. Although, the findings of this study may have minor discrepancies with others from different countries, it still indicates that parasites and their eggs/cysts in the body system can provoke disease burden such as appendicitis [3]. For this reason, measures should be adopted to monitor, control or prevent this tendency of parasites and/or their eggs/cysts from invasion of the body system. The obvious preventive measures would include: the improvement of general standards of sanitation through the installation of suitable sewage treatment and disposal facilities and provision of pipe-borne water supply as pre-requisites for successful prevention and control. Generally, health authorities should make concerted efforts to ensure the prevention of these parasitic worms from infecting man.

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