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Common Intestinal Parasites among Patients Attending Comprehensive Health Care Centre, Kware, Sokoto State.

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Abstract

Intestinal parasitic infections are a public health challenge particularly in developing countries. Gastrointestinal parasite infections are mostly due to poverty characterized by poor hygienic habits, absence of portable and clean water, absence of good faecal disposal system and poor nutrition. In a study, we investigated the common intestinal parasite among patients attending Comprehensive Health Care Centre, Kware. Nine hundred and Eighty-one patients who reported to Comprehensive Health Care Centre, Kware between March to September, 2010 with cases of gastrointestinal, abdominal pain and diarrhoea were examined for the presence of intestinal parasites. Direct wet film examination, formal ether concentration techniques and iodine stain-preparation was used. Two hundred and fifty apparently healthy members of Kware Local Government Area Community and immediate environ were examined as controls. A total of 214 (21.8%) out of the 981 patients examined were found to be infected with one or two parasites. Among the controls 18/250 (7.2%) were infected with common parasites ($p < 0.05$). Patients who are 18 years and above had higher percentage (28.5%) compared to patients between 1-5 years (12.7%) and those between aged 16-17 (28.0%). Infections were higher among male patients (28.5%) than in female patients (18.7%) ($p = 0.05$). The rate of parasitic infection was higher among subjects compared to controls. There is need for mass

treatment and health education campaign to enlighten the public on the need for good sanitary and hygienic practices.

Keywords: Intestinal Parasites, Patients, Kware, Sokoto State, Nigeria

Introduction

The intestinal tract is a conduit which provide loci for many parasitic organism, including protozoa, trematodes, cestodes and nematodes (Umeche, 1991). Intestinal parasitic infections remain an important cause of morbidity and mortality in developing countries (Procop, 2001). Intestinal infections have been described as constituting the greatest single worldwide cause of illness and disease. Intestinal parasite infections are amongst the most widespread of all chronic human infections worldwide (Chan, 1997).

Inadequate water, sanitation and hygiene are responsible for a major proportion of the burden of disease and death in developing countries, apart from causing hundreds of millions of people to surrender their right to healthy and dignified life. The common consequences of intestinal parasite



infections have been shown to affect nutritional status, physical development, mental function, verbal ability and inhibition control aspect of cognitive behavior in children (Hokes, 1994; Tripathy, 1972).

Intestinal parasitism is endemic in Nigeria due to poor environmental situation in most communities, improper disposal of waste, gross environmental, pollution with agrochemical and industrial wastes plus the steady contamination of surface and underground water (Fagbenro, 1987).

The effect of intestinal parasites on human host varies from little or no damage to very severe consequences. In most cases parasitic burden determines symptomatology (tissue ulceration, blockage, toxic effects anaemia and nutritional problems). *Gardia* is arguably the most common intestinal parasite infection of human worldwide and the second most common in the United States after pinworm (Leder, 2002; Katz et al., 2001). Most of the intestinal parasites get entrance into the gut by faecal contamination of food, water and fingers. Some intestinal parasite however, first enters the body via skin penetration by the larva stage of the parasite and after various migration route through tissue, mature in the intestine. The consequence of intestinal parasitic infection has been shown to affect nutritional status, physical development, mental function and verbal ability and inhibition of cognitive behavior in children. Intestinal infections have been described as constituting the greatest single worldwide cause of illness and disease and this may amount to 99% in developing countries. Intestinal parasite causes significant morbidity and mortality throughout the world, particularly in underdeveloped countries and in persons with co morbidities (de Silva *et al.*, 2003).

A previous report on the common intestinal parasite in the United States indicated that the common intestinal parasite was *E. vermicularis*, commonly referred to as the pinworm or seat worms. They also found out that the second most common intestinal parasite was *G. lamblia* (Corry et al., 2004). There is paucity of data on common intestinal parasites among patients in Sokoto, Nigeria. The aim of this

current study was to establish the prevalence of common intestinal parasite (protozoa, trematodes and nematodes) among patients attending the Comprehensive Healthcare Centre in Kware Sokoto, Nigeria.

Methodology

Materials and Methods

Nine hundred and eighty- one patients who reported to Comprehensive Health Care Centre Kware, with cases of gastroenteritis, abdominal pains and diarrhoea were studied. Two hundred and fifty apparently healthy (without symptom of gastroenteritis, abdominal pain and diarrhea) were monitored as controls. Selection was based on the willingness to participate in the study by giving a verbal informed consent. The control group consists of ninety-five females and one hundred and fifty-five males.

Sample Procedures

Stool samples collected in a clean, transparent, wide mouthed screw capped specimen bottles labeled with participants names, age, gender, clinic and hospital number was used for this study. Participants were instructed to defecate into the container and cover firmly, and to deliver same to the laboratory within 30 minutes of collection. Stool sample collected from patients on admission were delivered to the laboratory by the ward attendants with dully completed and signed request forms.

Laboratory Procedures

Stool samples submitted to the laboratory were examined with minimum delay. Samples were examined both macroscopically and microscopically.

Macroscopy

Samples were examined and described with regards to the consistency (formed, semi formed or loose, watery, diarrhoea; blood stained or mucoid). Descriptions were also given as to whether the stool

was frothy, greasy or foul smelling, and presence or absence of worm. Segments, adult worms or larvae.

Microscopy

Direct Wet Film Examination

The stool sample was thoroughly mixed and if blood stained or mucoid, the blood/mucoid portions are taken for examination. Using an applicator stick, a pinch of the specimen was taken and emulsified in a drop of normal saline on a clean, grease free slide. The resulting suspension was spread out to a thin film. This was covered with a clean cover slip and then examined using the x10 and x40 objectives. Parasites were identified using the description of Chesbrough (1998) and Pickenstein (1989).

Formol Ether Concentration Technique

The procedure described by Inabo et al. (2000) was followed. About two grams of faeces was emulsified in 10ml of 10% formal saline. This was strained through a coarse sieve into a centrifuge tube. About 35ml aliquot of ether was added, shaken and centrifuged at 2000rpm for 3 minutes. The fatty debris was removed and the supernatant poured off, leaving the last bottle sediment. After tapping the tube to a clean slide, it was covered with clean cover slip and examined using x10 and x40 objectives. Parasites were identified using the descriptive technique (Chesbrough, 1998; Pickanski, 1989).

Iodine Stain Preparation

This was used for staining the parasites thus making differentiation easier. After preparation of specimen as described above drops of lugol's iodine solution was added to the sediment. A drop of the stained sediment was placed on a clean, grease free slide, covered with a clean cover slip and examined using x10 and x40 objectives. To aid identification of

parasites seen in direct wet film preparation, a drop of lugol's iodine was gently introduced by the side of the cover slip and allowed to seep in and stain the film. This is then examined for parasite identification using the description of Chesbrough (1998) and Pickarski (1989).

Statistical Analysis

The data obtained was analyzed using SPSS version 20 (SPSS Inc., Chicago, IL., USA, 2011). The result was expressed as percentage and Mean \pm SD. Comparison was made using analysis of variance (ANOVA). Paired comparison was carried out using the student t- test and a p-value of ≤ 0.05 was considered as significant.

Result

A total of 214 (21.8%) out of the 981 patients examined were found to be infected with one or two parasites. Among the controls 18/250 (7.2%) were infected with common parasites ($p < 0.05$). Patients who are 18 years and above had higher percentage (28.5%) compared to patients between 1-5 years (12.7%) and those between aged 16-17 (28.0%). Infections were higher among male patients (28.5%) than in female patients (18.7%) ($p = 0.05$). The rate of parasitic infection was higher among subjects compared to controls. Table 1 shows the distribution of the common intestinal parasite based on age groups of subjects. Infection rate were higher among male patients (28.5%) than in female patients (18.7%) ($p < 0.05$). Table 2 shows the age and gender distribution of the common intestinal parasites.

**Table 1: Distribution of the common intestinal parasite based on age groups of subjects**

	1-5	6-17	18> (Adult)	Total No. of Parasite	%
No Examined	123	125	733	981	
	30*	98*	122*	250*	
Hookworms	3(2.3)	5(4.0)	63(8.6)	71*	(33.2%)
		3(3.1)	4(3.2)	7	(2.8%)
<i>A. lumbricoides</i>	2(1.6)	6(4.8)	21(2.9)	29	(13.6%)
	1*(3.3)				
<i>E. histolytica</i>	9(7.3)	16(12.8)	61(8.3)	86	(40.2%)
	1*(3.3)	3(3.1)	3(2.4)	7*	(2.8%)
<i>G. lamblia</i>	2(1.6)	3(2.4)	7(1.0)	12	(5.6%)
	-				
<i>S. mansoni</i>	-	5(4.0)	10(1.4)	15	(7.0%)
		-	2(1.6)	2	(0.8%)
<i>S. stercoralis</i>	-	-	1(0.1)	1	(0.4%)
Total No. of positive samples	16	35	163	214	(21.8%)
	1*	8*	9*	18	(7.2%)

Key: * = Control Group % = Percentage

Table 2: Age and Gender Distribution of the Common Intestinal Parasites

Designation	1 - 5		6 - 17 years		18 > (Adult)		Total no. of Parasite	
	Male	Female	Male	Female	Male	Female		%
No. Examined	75	46	103	53	320	384	981	
	110*	20*	72*	26	77	46	250	
Hookworms	-	3(6.5%)	3(2.9%)	2(3.8%)	44(13.8%)	19(4.9%)	71	33.2%
			3(4.2%)		2(2.6%)	2(4.4%)	7	2.8%
<i>A. lumbricoides</i>	-	2(4.4%)	4(3.9%)	2(3.8%)	7(2.2%)	14(3.7%)	29	13.6%
<i>E. histolytica</i>	7(2.7%)	1(5.0%)	2(2.8%)	1(3.8%)	3(3.9%)	32(8.2%)	7	3.3%
<i>G. lamblia</i>	2(9.8%)	2(4.4%)	7(6.8%)	9(16.9%)	29(9.1%)	5(1.3%)	86	40.2%
			1(1.9%)	2(2.8%)	2(0.6%)	2(0.5%)	12	5.6%
<i>S. mansoni</i>	-	-	1(1.4%)	1(3.8%)	-	2(4.4%)	2	0.9%
			5(4.9%)	-	8(2.5%)		15	7.0%
<i>S. stercoralis</i>	-	-	-	-	1(0.8%)	-	1	0.5%
No (%) of Positive subjects	9(12.0%)	7(15.3%)	20(20.4%)	15(28.3%)	91(28.35%)	72(18.7%)	214	21.8%
No (%) of Positive subjects	0(0%)	1 (5.6%)	6(20.4%)	2(28.3%)	5(28.5%)	4(18.7%)	18	7.2%

Discussion

The overall incidence of the common intestinal parasite was significantly higher among patient (21.8%) compared to controls (7.2%) ($p < 0.05$). The prevalence of intestinal parasites was higher among subjects in the 6-17 years age groups (28.0%) compared to the ≥ 18 years age group (22.3%) and the 1-5 years age groups (12.7%). Our finding of a prevalence of intestinal parasites of (21.8%) among hospital patients in this study is lower than a

prevalence of 40.2% observed by Corry *et al.* (2004) in a Naval Hospital in Jacksonville, Florida, U.S.A.

The commonest intestinal parasite found are *Entamoeba histolytica* (40.2%), Hookworm (33.2%), *Ascaris lumbricoides* (13.6%) *Schistosoma mansoni* (7.0%), *Giardia lamblia* (5.8%) and *Strongyloides stercoralis* (0.4%). Our finding is at variance with a study in the U.S.A. which indicated that the common intestinal parasite was *Enterobius vermicularis*. This difference may be due to the varying geographical locations in which the studies were carried out.

We observed a high prevalence of intestinal parasites among school age children. This could be attributed to the fact that these are school age children that are outgoing and thus more expose to intestinal parasite infection because they forage for fit bits of nutrient from wide varieties of between meals and also drinks from various sources of water which are possibly contaminated with pathogens (Oranusi, 2003).

The incidence intestinal parasite was significantly lower in the control group compared to the patients. The reason for this high prevalence may be attributable to the fact that the main source of water supply in the area is well. Well water increases the probability of acquiring intestinal parasite via contaminated water. Many communities in Kware depend on well water for drinking and other domestic uses. These wells are most times left uncovered are subject to contamination with various types of waste including human and animal faeces (Oranusi, 2003). Faecal contamination of vegetables through the use of night soil as fertilizer and sewage effluent for irrigation purposes could be another major source of infection (Inabo *et al.*, 2000).

In this study, we observed that females are more prone to *G. lamblia* and *E. histolytica* infection. This finding is in agreement with an earlier report (Inabo *et al.*, 2000). Several factors have been noted as predisposing to intestinal parasite infections, these include low socio-economic conditions, ignorance, overcrowding, poor environmental conditions variations in the level of exposure factors, nutritional status, inadequate water supply, unhygienic processing, handling, storage and hawking of food among others (Nwusu, 1980).

The prevalence of intestinal parasites was higher among male patients (28.5%) than in female patients (18.7%) ($p < 0.05$). Male patients were equally most infected by all the parasites except *Giardia lamblia* and *Entamoeba histolytica* which were more common in female patients. The reason for this male gender predisposition is not known.

Conclusion and Recommendation

Conclusion

This study indicated a higher prevalence of common intestinal parasites among patients compared to controls and among male compared to female patients. *Entamoeba histolytica* was found to be the commonest intestinal parasite.

Recommendation

To reduce the morbidity caused by intestinal parasite infection.

1. Mass health education campaign is needed to enlighten the public on good sanitary and hygienic practices.
2. Provision of public conveniences in the area.
3. Provision of regular portable and safe water supply.
4. Provision of better town planning, good housing with well-maintained drainage system and above all proper nutrition will go a long way to reducing human suffering due to infection by intestinal parasite.

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