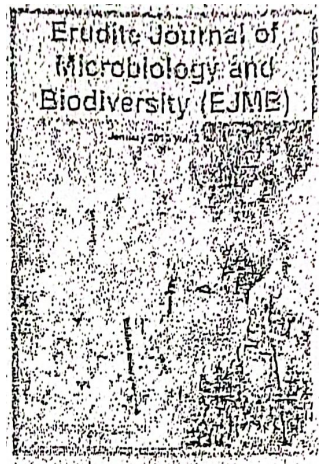
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Intestinal amoebiasis and other intestinal parasitoses among schoolchildren in rural communities of Moro

LGA, Kwara State, Nigeria

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Abstract

schoolchildren in four rural primary schools of Moro Local Government area of Kwara Satate, Nigeria. Wei preparation In fresh normal saline, Dobell's lodine preparation and formal ethyl conceniration methods were used to prepare the stool samples for examination. An overall prevalence of intestinal parasitoses was 77.5%among 414 children. E. histolytica dispar had the highest prevalence among the púpils of the four communities than other intestinal parasites with prevalence of 26.9%, 32.2% 22.7% and 23.9% in Malete. Elemere. Ore oiumoh and Animaje respectively. Prevalence of other intestinal parasites was also reported in relation to each community The prevalence of these intestinal parasites in relation to diarrhoelc stool, water supply and environmental conditions were discussed The study revealed that intestinal parasitic infections in rural communities represent a major public health problem. Health education, environmental health adequate water Sübply,provision of public and private latrines and personal hygiene are the

maior methods of reducing the occurrence of these intestinal parasitoses in rural areas.

Keywords:Erhistolytica, Ruralcommunities, Water sources and Intestinal parasitoses

INTRODUCTION

Amocbiasis is an infection caused by. Entamoeba histolytica is a single cell protozoan parasites that is worldwide and leads to about 40,000-110,000 death per. year (Waish, 1936). This parasite is generaily accepted as the only cause of invasive intestinal and extra-intestinal diseases (WHO, 1997). This parasite, is more prevalent in tropical and subtropical regions of the world.

but more in persons with lower socioeconomlc status,high populous communities and poor personal hygiene.Humans are the primary reservolr of E. histolytica;infection is acquired through ingestion of cysts from faecally contaminated materials such as water, hands and food The perlod of Incubation ranges from a few days or years, but commoniy le one to four weeks. The infection is alsc reported to be" endemicIn institutionalized persons, and men: who have sex with men. Approximately 10% of E histolytica infected individuals: showed clinlcal symptoms with Intestinal and/or extra-intestinal pathology (Selpulveda and Martinez-Palomo, 1984) E histolytica infection may result in intestinal amoebiasis of amoebic colitis,increasing diarrhoea progressing to grossly bloody dysenteric stool with lower abdominal pain tenesmus;weight loss and fever. Progressive involvement of the colon may lead to more severe complications such as acute fulminate or necrotizing colitis, amceboma and liver abscess, a disease thai is more severe in the very young.the elderly and the pregnant women (Farthing,et al.1996)

Other intestinal parasitic infections such as Giardia Jamblia[157] Ascaris lumbricoides Ancylostoma denodenalis/Necator americanusi (Hookworm), Trichuris trichiura and Strongyloides starcoralis among others,cause various conditions in children such as acute and persisient diarrhoea, vitamin and nutrient malabsorption and anaemia, which may be responsible for poor health;poor developmen and growth retardation in children, in addition to poor school aitendance and poor school Deriormance (Adams, 1991 Farthing, 1996)

A rural communty where this study was carried out is in Moro Local Government area of Kwara State, Nigeria.The people of this area are mainly traditional farmers;producing yam, cassava, maize and guinea-corn as means of their livelihood. Other occupations are trading,hunting and blacksmith. Most of the pupils attend pübllc schools where little or no fees were paid.

The main objectives of this study were to estimate the prevalence of intestinal parasites in the faeces of school children in rural community of Mvioro local government area of Kwara Stare to determine the relationship between these parasites to household water sources and examine other factors that may iniluence the increase of prevalence of intestinal parasites among these rural dwellers

METHODS

Study site

The study was carried out in primary schools of Malete.

Elemere: Ore-olumoh and Animaje rural communities of Moro Local Government area of Kwara State. These rural communlties were locared in Kwara Central Seratorial dlstrict of the State, within the middle belt region of Nigerla. It Is within the Savannan region and the climate is of equatorial type with one rainy and dry seasor annually. The annual rainfall rarges from 1,000 to 150035-38 (Kwara State Today, 1997), The communities are supplied will Waier by traditionally dug wells boreholes usually by Govermment or its agencies.stream/river and ponds The communities relied on rivers or pond when traditional dug wells dried up during the dry season

Study Population

The study population consisted of primary scnool childrer in the four communities that regisfered in those schools.A questionnaire survey data from the pupils included age.sex, water sources, weight and parents or guardians occupation Ethical approval for the study was granted by Kwara Stale University, Malete Further clearance was obiained irom local government health board. Oral consent was obtained from the village heads, clan heads and parents, in addition to heed and school teachers.Those who refused to give consent were excluded from the study

Sample Collection

All pupils that had consented to the study were enrolled by collection of their survey biodata No child had history of receiving anti neiminthic and

anti-protozoan drugs.within the past three montn in all the schools that were included in the study. A labelled sterile universal plastic bottle with pupil's name and serial number from tne register of biodata was given to each pupil. They were then given sample collection process that was done in local language of the pupils. These samples were taken to the laboratory as soon as received, usually less than two hours after collection.

Sample Examination

Macroscopic examination was done on each sample as soon as they reached the iaboratory usually iess than two assess the diarrhoeic condition of the pupils. Particular.presence of mucus and blood in stool.

Microscopic preparation was done frst in normal sallne.A drop of iresh no mal sallne was placed on ore eng of a slide a drop of Dobell's lodihe was placed on the other Using a wir loop, about 2 mg of formed specimen was mixed in each solution and smooth thin preparations were made, and e coverslp was applied to the slide.Mäterial trom the interior of the faecal sample as well as.the surrace was included. Watery specimens were examined directly and In lodine solution. The preparation was examined first with 10X oblectives for trophozoites and cysts. These ware confirmed with 40X objectives.Cysts of protozoan parasites were better idertified in Dobell's preparation Several microscope fields were examined with a 40X objectives before reporting a specimen as no parasites found (Cheesbrough,1991WHO 1992)

Ridley modified formal ether concentration technique (Ash and Orihel, 1992) was used to improve on the recovery of the ova and larvae of helminth parasites and cysts oi protozoan parasites from the samples that were missed in wet preparation The sediments were examined by placing one drop each on left side and anotner on right side of the slide A drop of Dobell's iodine was added to the left preparation for the histolytica/dispar Both preparations were covered with coverslip and examined Chi-square test was used to significant

RESULTS

Pupils of four primary schools in these rural communities were enrolled for the study. The villageswere Malete,Elemere Ore-Olumon and Animaje with pupils population size of 156 (males 81 female 75) 115 (males 47)females 63) 75 (males 38, females 37) and 67 (males 31, females 36) respecively.

321 (77 7%) of 413 specimens distributed as follows:Malete 115 (73 7%), Elémere 86 (74:8%) Ore-olumoh 70(92.1%) and Arimaje 50 (74 6%)E: histolytica/dispar has the highest prevalence among the pupils of the four communities than any other intestinal parasites, with the prevalence of 26:9% 32.2%, 22.7% and 23.9%in Malete Elemere. Ore olumoh and Animaje respectively.Eggs of Ancylostoma Necator species and Ascaris lumbricoides were the most abundant intestinal nematodes Table 1, showed the distribution of other intestinal parasites among pupils of these communities.(ITable 1)

Table 2 shows prevalence of intestinal parasitic infections among the pupils of four villages according to

age groups and sexes There were more intestinal parasitlo Infectlons arriong age group 5-9 years ihan othe age groups although fewer pupile were investigated Ih age group 15-20 years, apparentiy moved to secondary school (high school). There were 12 (37 5%) and 14 (34 1%) in age groups 5-9 yeare ano 10-14 year respectively thian male puplls 3 (9.1%) and 10 (21.3%) in age groups 5-9 years and 10-14 years respectively in Maiete Simllar result was obiained in Elemere,Olu olumoh expeci in Animaje where age group 5-9 years males were more infected than females.(Table 2)

Table 3 shows epidemiologie teatures relaied to Enfamecba histolytica/dispar and Giardia lamblia. There were three main sources of domestic supply of water to these rural communities these were bore holes usually constructed by Government or its agency, locally dug well.and stream/river Majorty of these rural communities relied on bore holes The prevalence: of E.histolytica/dispar was higher in pupils that useo streamiriver as source of domestic water with 7 (41.1%).! (33.3%) and1 (25%) in Malete Elemere and Animaje respectively, nowever, E histolytica/dispar has a higher prevalence with pupils thet used bore hole than stream/rivér in Ore-olumoh with 11 (23.4%) and/2(16.7%) respectively. Table 3 also showed that pupils with E.histolytica dispar produced more watery stool than pupils infected with G lamblia, although there were cases of multiple infections with other intestinal parasites.E.histolytica/dispar has the highest prevalence of 45.7%among the pupils that produced watery stool which occurred in Elemere community.(Table 3)

DISCUSSION

The classical method tor diagnosis E. histolytica nas been microscopy, however this method does noi discriminate between E histolytica and E. dispar (Roches and Bento, 1999). This does not invalidate our present study has previously observed by other authors (Roches infection is therefore: reporied as E: histolytica'dispar (Diamond and Clark, 1993) We are aware of new and more sophisticated techniques are now available such as the polymerase cnain reaction (PCR) technique:isoenzyme analysis and Enzyme-linked Immunosorbent Assay-(ELISA) that are more specific in identification of this and other protozoan parasites, unfortunately these are not yet available in rural setting (Nuran et al.. 2004:Gonin and Trudal, 2003)

There has been no enteroparasitologic surveys carried

Table i. Distrlbution of Intestinal parasites among puplis of the our rural villages:

	Villages			
	Malete	Elemere	Ore-olumon	Animaje
	n(%)	(%)	n(%)	n1%
Parasites				
E.hisiolytica	41(26.9)	37(32.2)	17(22.7)	16(23.9)
G.lamblia	13(8.3)	10(8.7)	11 147	8117
A iumoricoides	20(12.8)	7(6.1)	13(17.3	619.0
Ancyiostoma Nectar sp	22(141)	17(14.8)	10(13:3)	12(18.0
T.irichuira	11(7.1)	8(7.0)	10(13.3)	4(6.0)
S. starcoralis	9(58)	8.(7.0)	9(12.0)	A(5:0)
Male	56(35.9)	33(28.7)	29(38:2)	27(40.3)
Female	59(51.3)	53(46.1)	41(53.9)	23(34.3)

out in these rural communities of Moro local government area of Kwara State. Most of the previous studies were carried out in teruary and general hospitals located in the study showed two intestinal protozoan parasites E histolvtica/dispar and G. lamblia. The prevalence of E.nistolytica/aispar was 26.7%-32.2%, 22.7 and 23.9% n Malete, Elemere, Ore-olumoh and Animaje respectively.This was higher than a prevalence of 11.2% obiained in recorded in a hospital based study in llorin in 2001(Nwabuishi, 2001) A result comparable to this report was obtained in a stüdy carried in Agboville area of Coie divoire among school children in a rural area with prevalence of 18.8% (Mamadou er al, 2010) However in another work in rural area among school children another author obtained a higher prevalence of 37:3%in a town near Man of Western Cote d'ivoire.

'G lamblia has a prevalence of 8.3% 87%, 14.7%,and 117% n Malete Elemere Ore oulmoh and Animaje respectively This prevalence was lower than that of E.histolytica/dispar obtained-in this study Mamadou and his colleagues repored a prevalence of 13.8% with G lemblia in Agbovile area of Cote'd ivcire by Utzinger and colleagues (1999) a very high prevalence of 51% was.reported in Sudan (Amir et al., 2011) E. histolytica/dispar and G. lamblia are responsible for frequent diarrhoeal disease and malabsorption in children of this age groups.and the cause of poor school attendance (Utzinger et al.,1999). Other protozoan parasites detected and identified but not reported and presented in Table 1 were Entamoeba coli and Endolimax nana because they are non-pathogenic to human. Others not

found that has.been reported by other authors were Chilomastrix mesnili and Blastocytes hominis (Roches and Bento,1999Utzinger et al., 1999).

Helminth parasite found among pupils in these rural villages was presented in Table 1. The prevalence of these helminth parasites found in thisstudy was comparable to the stucy done in rural Bioko Equatorial Guinea(Roches and Bento, 1999), although with prevalence of 141% in Ancylostoma Necator has a higher prevalence in our report than with 0.9% obtained in rural Bioko. The immediate importance of Ancylostoma/Necator A lumbricoides, and T. trichiura detected in these age groups is thel they have.been implicated as he cause of growth retardation (Stepnensen ef al, 1989) Larva of S: stercoralis was detected in the study samples of some:pupils. The highest prevalence of 12.8% of S. stercoralis occurred in Ore oiumon compared to other three rural villages. S.stercoralis along with others intestinal helminths have been implicated in childhood nutrient absorption failure and malnutrition (Emir et al, 2011) The usually probiem of low detectin of helminth parasites in most field studies was overcome in this present study by using 45 mg formed or about 5 mi of watery stool in formal-ethyi concentration method, which greatly improved eggs cysts and larvae recovery. Other helminth parasites such as Enterobius vermicularis and Schistosoma mansoni were not detecied in the study as others did (Roches and Bento, 1999; Stephensen et al., 1989).

Most of the helminth and protozoan parasites detecied in this: study were acquired through orai-faecai rouie except Ancylostomal Nectar ano S. stercoralis that were acquired through skin penetration. Water sources, human waste

disposal methods and personal hygiene constitute major routes of acquisition of these parasites. In this study three sources of household water were identified.Table 3.showed water sources and distribution of E.histolytica dispar and G. lamblia. Majority of household in these communities use government provided boreholes

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Table 2: Prevalence ol intestinal parasilic-inlections in lour villages according lo nge and sex groups

Age (Years)	Sex	VILLAGES: Malele No.of Infection	Elemere No ofInleclion	Ore-Olumah No of In
		N El Gl AL AN Ss	NE G A AN T Ss	

5.9	Male Femial e Bolh	33 3 2 6 2 5 2 32 12 1 5 2 01 765 15 3 11 4 5 3	17-3 0 1 6 0 176 1 2 3 2 3 349 1 3 9 2 4	18 30 8 7 2 4 48 1 11 2 5 6	12 0 20 3 3 32
10-14	Male Fcmial e	47 10 6 3 12 3 3 14 4 6 6 3 2 88 24 10 918 6 5	29 1 3 2 1 2 42 12 43 5 71 23 8 4 无 3 3	8 17 3 32 3 2 10 3 14 2 1 27 6 4 6 5 3	185 2 131 31 9 4 3
15-20	Both Male Femal e Bolh	0 0 0 0 0 0 2 2 1 0 0 0 3 2 0 0 0 0	1 0 0 0 9 3 0 2 10 0	0 0 0 :0 0 0 0 00 0 0 0: 20 00 0 0 0	0 07 0 - 3 0 0 0 3 0 00

En: Enlamoeba liislorlica/dispar el Giardia lambla Al Ascans umbricoides ANAncyiosiana Necalor species T Thichiine riliuira, Sa Strongyloides slerdosrsne

Numbor uan.Percenlage of nümber

	Malete			Elemere			Ore-Olumoh				Animnaje	
Rural surveys	n	Eh	GI	n	Eh	GI	n.	Eh	GI	n	Eh	GI
Bore:hole :Well Stream/River Walery Stool	129(82.7) 10(6.5) 17(10:9) 46(30.0)	n(%) 25(19.4) (10:0) 7(411) 22(47.8)	n(%) 12(9.3) 0(0.0) 4(23.5) 9(19:6)	79(68.7) 3(2.6) 33(28:7) 35(30.4)	n(%) 23(29:1) 0(0.0) 11(33.3)	口（%） 10(12.7) 0(0.0) 2(6.1)	47(62.7) 6.(8:0 12(16.0)	n(%) 11(23.4) 0(0.0) 2(16.7)	(%) 6(12.8) 1(16.7) 2(16.7)	62(92.5) 1(1.5) 4(6.0) 20(32.3)	11(%) 14(22.6) 0(0.0) 1.(25)	n(%) 9.(14.! 0(0.0) 0(0.0)

					16(45.7)	6(171)	27(36.0)	10:(37.0)	10(37.0)		9(45)	6(30)

(belween 62.7% and 92.5% population of pupils have boreholes), however (6 28%) of other households use stream/river waler as souice of drinking water and for other domestic uses.treated witl any purilicalion methods before use:This study indicaled that E. histoltica/dispar and G. lamblia occurred wilh higher frequency in pupils whose household depended on stream/river than those that use borehole/well waler, this was observed by other researchers (Unicef, 1997 Chartterjee et al., 1989)

Faeces from pupils were examined for consistency. A number of pupils from the villages produced loose to walery stool, whiile others produced soft to hard formed stool The percentage of watery stool was 30.0%, 304%;36.0% and 32.3% in Malete Elemere, Ore-olumoh and Animaje repeclively (Table 3) Oré-olumoh thal has the highest percentage of pupils with watery stool has the highest percentage of pupils that use slream/river as source of waler for domestic use. There was a clear associalion wilh diarrhoea and E.histolytica/dispar in this study.Similar studies have corroborated this report (Unicel 1997 Charllerjee er al 1989)

In conclusion, diarihoeal disease is associated mainly wilh poverty, poor environment, personal.Provision of borehole, appropriate disposal of human excrela and health education in these rural communilies would.reduce transmission of dianhoeal disease. Other measure such as wearing of simple slippers among the pupils will reduice cases of skin penetrating helminlh parasites. All pupils lound infecled in these communily schools were adequately. Irealed;while each class of the schools was given lieallh educalion talk on the intestinal parasites, how they were acquired and how re-infection.can be prevented.

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