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Full Length Research Paper

Communal evaluation of Intestinal Helminthes in some Guineaworm-Controlled Communities in Ogun State, Nigeria

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The public health concern for intestinal helminthes emphasizes the need for assessment to reduce the burden of diseases. The study which was conducted from July 2008 to February 2009 evaluates the impact of health education on the prevalence of intestinal helminthes. Stool samples from 93 males and 125 females (5 years of age and above) were collected aseptically from respondents in guinea worm-controlled communities of Abata, Ikija, Kooku, Ogboye and Agbugburu in Odeda Local Government area of Ogun State. Stools were examined using Kato-Katz technique, and structured questionnaires used to elicit knowledge and perception of the parasites. Results revealed that 34 (15.6%) of the 218 persons examined were infected with intestinal helminths. *Ascaris lumbricoides* was observed to be more prevalent with 21 out of 218 persons examined were infected (9.63%), followed by hookworm which was found in 9 out of 218 (4.13%) and *Trichuris trichiura* which was found in 4 out of 218 people examined (1.84%); though with no significant differences ($p>0.05$) in the prevalence of helminth parasites. Females (10.4%) were more infected than males (8.6%), but no significant difference in infection status with respect to sex ($p>0.05$). Infections were high in age group 5-19 years, but decreased with increasing age level with no significant differences in the prevalence at $p>0.05$. Evaluation of respondents' knowledge revealed that most (90.4%) are aware of intestinal parasites. Results also showed that previous health education had significant effect on the prevalence level of helminthes observed. There is the need for more health measures that will be directed at the community level in terms of free health periodical/ drug administration against parasitic diseases.

Key words: Health education, impact, intestinal helminthes, Ogun State.

INTRODUCTION

Intestinal helminthes are transmitted by eggs ejested in human faeces, which contaminate the soil and water sources in areas that lack adequate sanitation. Humans are infected through ingestion of infective eggs or larvae in contaminated foods, on hands, in water, and by penetration of the skin by infective larvae (hookworm) in the soil (Mutressor, et al., 1992).

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Intestinal parasitic infections are highly prevalent in developing countries, mainly due to deficiency of sanitary facilities, unsafe human waste disposal systems, inadequacy and lack of safe water supply and low economic status (Savioli et al., 1992). Nigeria is one of such countries, where infections caused by intestinal parasites are a public health problem (Onadeko and Ladipo, 1989; Bello et al., 1992; WHO, 2002) and the poor socio-economic environment is a major factor facilitating the prevalence of the disease (Walsh and Kenneth, 1979; WHO, 1981).

The prevalence rates of intestinal parasites varies

considerably in different parts of Nigeria, where studies had shown that *Ascaris lumbricoides* is the most prevalent, followed by hookworms, *Trichuris trichiura* and *Strongyloides stercoralis* (Asaol et al., 2002; Mafiana, 1995; Sam-Wobo and Mafina, 2004).

Mbanugo and Abazie (2002) observed that the heavy parasite burden by *A .lumbricoides* and hookworms is probably associated with digestive and nutritional disturbances, blockages of the gut, abdominal pain, disturbed sleep and perforation of tissues. These coupled with malnutrition may lead to anaemia, a major cause of disability.

The effects of these intestinal helminthes and their public health concern emphasizes the need for continuing assessment of the prevalence to reduce the burden of the diseases. The occurrences of intestinal helminthes infections among communities in Ogun State are largely unreported. The present study was carried to determine the prevalence of intestinal helminthes and the possible impact of the previous health education in guinea worm on the control of other diseases such in some guinea worm-controlled communities of Ogun State, Nigeria**.**

MATERIALS AND METHODS

Study area

The study communities are located in Odeda Local Government Area (LGA) of Ogun State. Odeda LGA lies between longitude 3° 15'E and 3°45'E and latitude 7°10'N and 7° 25'N of Ogun State, Nigeria. There are about 25-30 semi-urban areas and 860 villages and hamlets in the local government area and the people are predominantly *Egba*s who have their homesteads and farms in the area. Others are the *Igedes, Ijeshas* and other minority groups. The people are predominantly farmers, who engaged in small scale farming.

Selection of communities in the study area

Odeda local government is one of the most infected areas in Ogun state in the first guinea worm active case search conducted in Nigeria in 1988 (NIGEP, 1989). The last reported cases in Ogun State between 2004 and 2005 included Odeda as one of the two local government involve; however as at the time of the study, the local government are recorded no case to date. Thus five villages were selected from Odeda local government for the study. The communities are: Ikija, Abata, Kooku, Ogboye and Agbugburu

Consent and ethical consideration

Written consent and approval were obtained from the State Ministry of Health and the Local Government Medical Director to use the selected communities. Consent of the community members was sought at different stages before sample collection and questionnaire administration.

Sample size

Six hundred and twenty persons (70%) of the population in the selected villages initially enrolled for the study, but two hundred and eighteen persons (35%) enrolled, accepted to participate in the study and were examined. The study was conducted from July, 2008 to January, 2009.

Faecal collection and examination for egg count

Properly labeled plastic containers with tight lids containing the name and sex were given to individuals. They were instructed to carefully put a small quantity of fresh stool with an applicator stick (in order to prevent destruction of egg) in it. The stool samples which were collected over a 48 h period were examined at the Parasitology unit laboratory of the Department of Biological Sciences, University of Agriculture, Abeokuta for microscopic examination using Kato thick method (Martin and Beaver, 1968).

Questionnaire

Structured questionnaires were administered to 218 respondents in order to obtain demographic information and to assess their level of knowledge, attitudes and practices in regard to helminthes. The questionnaires were interpreted in the *YORUBA* language and translated back to English for data entry and analysis.

Data analysis

Epi Info version 6 statistical software was used in analyzing the questionnaires. SPSS version 16 software employing simple percentiles, chi-square, paired t-tests was used in the analysis of prevalence and intensity of infection. Correlation coefficient was calculated in order to determine possible relationships between infection patterns, prevalence and intensity of infection as indicated by (Sam-Wobo and Mafiana, 2004)

RESULTS

The demographic information (Table 1) across the communities showed that more females' respondents were examined except in Ikija that had more male respondents. There were also varying age groups with no particular group predominating across the communities. Chi-square analysis revealed no significance difference between age and sex distribution ($p>0.05$).

A total of 34 (15.6%) of the 218 persons examined were infected with intestinal helminths. *A. lumbricoides* was observed to be more prevalent with 21 out of 218 persons examined were infected (9.63%), followed by hookworm which was found in 9 out of 218 (4.13%) and *T. trichiura* which was found in 4 out of 218 people examined (1.84%); though with no significant differences ($p>0.05$) in the prevalence of helminth parasites (Table 2).

The prevalence of helminth parasites (Table 3) was higherin females (10.4%) than males (8.6%). Infection with intestinal helminthes was higher among individuals 5-19 years old and decreased in older age groups. There was no significant difference between the presence of intestinal helminths relative to hostage and sex (gender?) ($p>0.05$), hence, infection rate is not significantly affected by age and sex. From the cumulative 34 stool samples

Table 1. Demographic information of respondents in the study communities.

Sex	Ikija		Abata		Kooku		Ogboye		Agbugburu	
	NE	%	NE	%	NE	%	NE	%	NE	%
Male	15	57.69	09	36.00	29	43.28	30	46.15	10	28.57
Female	11	42.31	16	64.00	38	56.72	35	53.86	25	71.43
Total	26		25		67		65		35	

Age group (years)	%	%	%	%	%
5 - 19	3.85	16.00	43.28	38.46	34.28
20 – 34	19.23	8.00	10.45	24.62	22.86
35 – 49	19.23	28.00	23.88	10.77	14.29
50 and above	57.69	48.00	22.39	26.15	28.57

NE – Number Examined

Table 2. Prevalence of intestinal helminth parasites in the communities of study.

Communities	*Ascaris lumbricoides*			Hookworm			*Trichuris trichiura*		
	NE	NI	%	NE	NI	%	NE	NI	%
Ikija	26	05	19.23	26	02	7.69	26	00	0.00
Abata	25	02	8.00	25	02	8.00	25	00	0.00
Kooku	67	07	10.45	67	01	1.49	67	02	2.98
Ogboye	65	04	6.15	65	02	3.08	65	02	3.08
Agbugburu	35	03	8.57	35	02	5.71	35	00	0.00
Total	218	21	9.63		09	4.13		04	1.84

Table 3. Prevalence of intestinal helminthes by sex and age group in the communities.

Age group (years)		*Ascaris lumbricoides*			Hookworm			*Trichuris trichiura*		
		NE	NI	%	NE	NI	%	NE	NI	%
Male	5 - 19	39	03	7.69	39	01	2.56	39	02	5.13
	20 – 34	09	02	22.22	09	00	0.00	09	00	0.00
	35 – 49	12	02	16.66	12	00	0.00	12	00	0.00
	50 and above	33	01	3.03	33	00	0.00	33	00	0.00
	Total	93	08	8.60	93	01	1.08	93	02	2.15
Female	5-19	32	04	12.50	32	01	3.12	39	02	6.25
	20-34	28	02	7.14	28	03	10.71	28	00	0.00
	35-49	28	03	10.71	28	01	3.57	28	00	0.00
	50 and above	37	04	10.81	37	03	8.11	37	00	0.00
	Total	125	13	10.40	125	08	6.40	125	02	1.60

NE, Number Examined; NI, Number Infected

that were infected, 19 respondents had between 35-90 eggs per gramme (epg) which signifies light infection, while 15 respondents had 105 epg or greater, which indicates a moderate to heavy infection.

Evaluation of respondents' knowledge to determine the impact of previous health education regarding guinea worm disease revealed that 84% practice hand-washing before eating and majority (88.5%) of respondents use foot-wear. 95.4% defecate in nearby bushes surrounding the communities, while 4.6% use improvised toilet containers called "*potty*" due to non availability of toilet facilities. About 66.1% of respondents use leaves for anal cleaning after defecation while 33.9% use water. They claim that the inaccessibility to water especially during farming time contributes most to this behavior (Table 4).

Table 4. Assessment of respondents Knowledge and factors associated with helminthes transmission.

Parameter		Ikija (%)	Abata (%)	Kooku (%)	Ogboye (%)	Agbugburu (%)	Total (%)
Do you wash hands before eating	Yes	73.1	92.0	80.6	84.6	91.4	84.0
	No	26.9	8.0	19.4	15.4	8.6	16.1
If yes, what do you use	Water	89.5	100.0	94.4	89.1	96.9	93.4
	Water + soap	0.0	0.0	0.0	0.0	0.0	0.0
	Leaves	10.5	0.0	5.6	10.9	3.1	6.6
Do you wear slippers/sandals	Always	15.4	12.0	9.0	13.8	8.6	11.5
	Sometimes	84.6	88.0	91.0	86.2	91.4	88.5
Type of toilet facility used	Potty	0.0	0.0	7.5	6.2	2.9	4.6
	Pit latrine	0.0	0.0	0.0	0.0	0.0	0.0
	Open field/nearby bush	100.0	100.0	92.5	93.8	97.1	95.4
	Water closet	0.0	0.0	0.0	0.0	0.0	0.0
Material use for anal cleaning after defaecation	Water	0.0	0.0	0.0	0.0	0.0	0.0
	Paper	0.0	0.0	0.0	0.0	0.0	0.0
	Maize cobs	42.3	40.0	67.2	80.0	74.3	66.1
	Leaves	57.7	60.0	32.8	20.0	25.7	33.9
Washing hands after defaecation	Yes	46.2	36.0	41.8	40.0	42.9	41.3
	No	53.8	64.0	58.2	60.0	57.1	58.7
Material for washing hand	Water	100.0	100.0	100.0	100.0	100.0	100.0
	Water + soap	0.0	0.0	0.0	0.0	0.0	0.0
Picking food from ground	Yes	7.69	12.0	6.0	12.3	8.6	9.2
	No	92.31	88.0	94.0	87.7	91.4	90.8
History of stomach pain	Yes	73.1	84.0	71.6	60.0	68.6	69.3
	No	11.5	8.0	15.0	26.2	22.8	18.3
	Do not know	15.4	8.0	13.4	13.8	8.6	12.4
Once passed out worm	Yes	53.8	76.0	53.7	52.3	60.0	56.9
	No	19.2	24.0	29.9	36.9	20.0	28.4
	Don't know	27.0	0.0	16.4	10.8	20.0	14.7
If yes, when	<5 yrs	14.3	52.6	33.3	29.4	33.3	33.1
	>5 yrs	85.7	47.4	66.7	70.6	66.7	66.9

Earlier health education apparently had a strong impact on the respondents as 90.4% said that they still practice the various health education intervention strategies they were already aware of.

DISCUSSION

The study found a low prevalence of intestinal helminthes suggesting health knowledge acquired earlier has had an impact in reducing the prevalence and intensity of infections with other helminthes, even when environmental conditions were below average. This may be due to health education introduced by WHO as one of the primary health care system tool employed during the guinea worm control programme in the communities (Asaolu and Ofoeze, 2003). Also, it could be due to annual community directed distribution of ivermectin sponsored by the

African Programme for Onchocerciaisis control (APOC).

Our finding that *A. lumbricoides* is the most prevalent helminth in the communities is consistent with earlier reports (Mafiana et al., 2000; Ogbe et al., 2002; Adeyeba and Akinlabi, 2002; Kirwan et al., 2009) However, in some parts of Nigeria, hookworm has been reported as the most prevalent (Suswan et al., 1992; Anosike et al., 2005). Further, *T. trichiura* has been reported as the most prevalent in parts of Lagos and Oyo (Ogbe and Adu, 1992; Asaolu et al., 2002).

Results obtained in this study revealed no significant differences with respect to sex which suggests that both sexes were exposed to the same environmental conditions, occupational settings, and so on, that could predispose them to infections. This observation is consistent with the findings of other researchers that helminth infections are not sex-dependent (Mafiana, 1995; Sam-Wobo, 1999).

A. lumbricoides prevalence was observed to be relatively high in persons 20 years or less in age, and to be lower in persons 20 years of age or older. This could be attributable to changes in behaviour and possibly due to knowledge of the source of infection gained earlier. Hookworm infection was observed to be more prevalent among age groups above 20 years in this study. This could be due to a greater involvement in farming activities as reported earlier (Mafiana et al., 2000).

Belief and ignorance can be serious impediments to the success of most health programmes in developing countries (Falode, 1998; Brieger et al., 1991). In this study majority (90.4%) of the respondents understood the factors that promote disease transmission. The 9.6% which were less knowledgeable were made up of children less than 10 years of age. On these bases, sustained health education on proper environmental sanitation, personal cleanliness, along with good water supply free from disease causing agents should continue to be promoted.

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