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Guinea worm disease and its persistence in some rural communities of Nigeria

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Abstract

Studies were carried out in six villages of Ogun State, Nigeria, from January to December 2004 to identify the reasons for the persistence of guinea worm disease in spite of eradication measures. Pre-tested structured questionnaires were administered to 250 head of households in the endemic villages to assess their knowledge, attitude and practice (KAP) in the management of guinea worm disease. The overall prevalence of infection for the study-period was 1.0% . 96.0% of the respondents depended solely on ponds for drinking water during the dry season. 80.0% of the respondents had been infected before, 68.0% think that the disease is caused by spiritual attack, while 4.0% associated the disease to drinking bad water. 77.5% did not know if it is possible to prevent the disease. It was observed that immigrant farm labourers and apathy on the part of eradication officials may play vital roles in the transmission of the disease in the area. This study shows that there is need to ascertain and specifically address reasons for the persistence of the disease in areas still endemic.

Keywords: guinea worm disease, persistence, eradication, Nigeria.

Introduction

Guinea worm is a disabling, painful, debilitating water-borne helminthic disease with multiple adverse consequences on health, agriculture, school attendance, religious activities and the overall quality of life of the affected communities [1]. The life cycle of the disease has been well documented [1-4]. Key intervention strategies to eradicate guinea worm disease are safe water supply, vector control using Abate, health education and case management [4].

Although the number of people infected by guinea worm worldwide has dropped by 98.0% over the past twelve years, eradication of the disease has been difficult and is raising major concerns and anxiety among funding and development partners [5]. A recent collaborative meeting targets to make guinea worm the next disease to be eradicated from the Earth after smallpox in which Sudan, Ghana and Nigeria account for 96.0% of the world's remaining guinea worm cases [6].

Although, Nigeria has shown remarkable progress in reducing the number of reported cases by 62.0% from 2002 to 2003 [7]. However, cases continue to persist in some villages despite eradication measures. This study aims at investigating reasons for the persistence of the guinea worm disease in Ogun State, Nigeria.

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Materials and methods

Study area

This study was carried out in Odeda Local Government Area (LGA) in Ogun State (the only infected LGA at the time of this study). It is located in the rain forest zone of south-western Nigeria. It is predominantly a rural community with settlements varying from small homesteads to much larger rural towns. Men are predominantly small-scale farmers while women combine domestic duties with petty trading and crop harvesting.

The LGA had the highest number of guinea worm cases in Ogun State in the first guinea worm active case search conducted in 1988 in Nigeria. [8]. Six villages where selected for the study in the LGA had reported cases of guinea worm for the period of January-December 2004.These villages are Abata, Apena, Kemta, Bosero, Erinle, Ikaagbo, and Ikija.

Basic infrastructural facilities like road, safe water, and electricity and health care services are lacking in these villages. There is no primary school and houses are mostly built with mud and zinc or thatched roofs. Their main sources of water supply are ponds and streams located at a distance from the villages. There is one abandoned water well each in Abata and Ikija, functional one each in Apena-Kemta, Erinle and Ikagbo and none in Bosero.

Methods

Preliminary visits were made to the community leaders in the company of the Global 2000 field staff attached to the LGA to secure the necessary approval, cooperation and support needed for the study. The prevalence of the disease in each village during the period of study was determined by visiting the villages every month to record guinea worm cases.

Two hundred and fifty heads of households were randomly selected in the 6 villages and interviewed, using pre-tested structured questionnaires, to assess their knowledge, attitude and practice in the management of guinea worm disease. This included demographic characteristics of respondents, guinea worm infection in respondents, source and treatment of drinking water, and the knowledge of the respondents on the aetiology and mode of transmission of the guinea worm disease. The effectiveness of health education and other interventions as perceived by the respondents was also assessed. Personal interviews, focal group discussions and observations techniques were also employed to deduce the causative (or risk) factors responsible for the persistence of the disease in the area.

Results

A total of 2,410 people in the 6 villages where monitored for guinea worm infection during the period under study, 24 (1.0 %) were found to be infected. The prevalence of guinea worm infection was highest in Abata village 13 (3.6 %) (Table 1).

Table 1: Prevalence of guinea worm infection in study villages (Jan-Dec 2004).

Village Name	No examined	No infected	% infected
Abata	360	13	3.6
Apena Kemta	300	1	0.3
Erinle	400	1	0.3
Ikaagbo	400	1	0.3
Ikija	600	6	1.0
Bosero	300	2	0.6
Total	2,410	24	1.0

Seventy per cent of the respondents were male and 30.0% female. 34.0% of the head of households were between ages of 40-49 years followed by 24.0% who were between ages 50-59 years. 87.2% of the head of households interviewed were farmers. Those that engage in other occupations were also part-time farmers (Table 2). Concerning water usage 96.0% of the respondents depend solely on pond water for drinking during the dry season, while 40.0% also used the pond water during the rainy season. 28.0% that used rain water (Table 3). In water treatment, 44.0% use alum for water treatment; 24.0% used filter cloths, while 24.0% do not treat their drinking water. All the head of households interviewed considered guinea worm disease a serious problem in their villages. However, as shown in Table 4, 68.0% think that guinea worm disease is caused by spiritual attack. 4.0% associated the disease to drinking bad water.

When respondents were further probed and asked *'Do you know that guinea worm disease is transmitted through water?'* 87.5% did not know, 7.5% said 'no' while 5.0% said 'yes'. When they were asked why some people are more susceptible to infection, 50.0% did not know, 40.0% said it is due to inherited susceptibility while 10.0% said it is due to the use of bad water. 77.5% did not know if it is possible to prevent the guinea worm disease, 20.0% said it can be prevented while 2.5% said it can not be prevented.

Table 2: Demographic characterise of respondents.

Age group	No of person	%
20-29	15	6.0
30-39	35	14.0
40-49	85	34.0
50-59	60	24.0
60+	55	22.0
Sex		
Male	1,687	70.0
Female	723	30.0
Occupation		
Farming	218	87.2
Trading	10	4.0
Food selling	4	1.6
Schooling	12	4.8
Tailoring	6	2.4

Table 3: Source and treatment of drinking water by respondents.

Season	Sources	No of respondent	%
Dry	Pond	240	96.0
	Well	0	0.0
	Pond/Well		10 4
	Rain	0	0
Rainy	Pond	100	40
	Well	30	12
	Pond/well	50	20
	Rain	70	28
	Treatment		
	No treatment	80	32
	Boiling	10	4
	Filtering	60	24
	Addition of alum	100	44

Table 4: Perceptions of causes and ways of preventing guinea worm disease by respondents.

Causes	No of respondents	%
Drinking bad water	10	4.0
Inherited	50	20.0
Spiritual attack	170	68.0
Donít know	20	8.0
Ways of prevention		
Taking blood tonic	10	25.0
Avoiding flood	3	7.5
Good drinking water	9	22.5
Cleanliness	4	10.0
Avoiding conflict	7	17.5
Traditional medicine	5	12.5
Good food	2	5.0

Table 4 also shows ways of preventing the guinea worm disease stated by those that said it can be prevented. 25.0% of the respondents believed that taking drugs that can purify the blood is the best preventive measure. Only 22.5% said it can be prevented by taking good drinking water as a way of preventing the disease.

The following eradication activities observed in the study-area during the study period included:

— Distribution of cloth filters by Global 2000 officials for use in filtering drinking water in households.

— Global 2000 field officers gave pain relieving drugs to infected villagers and also dressed their ulcers. These drugs and treatment kit were also given to the village-based health workers (VBHWs) for the communitiesí first aid box. The VBHWs also treated the wounds of victims.

— Provision of the chemical Abate by Global 2000, The Carter Centre and treatment of village ponds with the Abate by Global 2000 officials. It was however observed that the volume of water in the ponds was not accurately calculated before the application of the Abate in one of the visits to treat the ponds. So also the field officers visitation which is supposed to be every fortnight is in reality after several weeks. Village leaders complained that these officers do not visit regularly.

— Abandoned hand-dug-wells were provided by politicians in some villages. The functioning wells in Apena-Kemta, Erinle and Ikagbo provide insufficient water. The well in Apena-Kemta dry up in the dry season, well in Ikagbo is shared with neighbouring village while the well in Erinle is insufficient for the villageís large population.

Respondents and village leaders indicated that only Global 2000, The Carter Centre, support guinea worm eradication in their LGA. Immigrant farm labourers from Benue State were seen in the LGA.

Discussion

Only 1.0% was infected in the population studied. However if this focus of infection persists, it is enough to cause a resurgence of the guinea worm disease in other areas that are disease free. The ease with which drancunculiasis cases can increase when it is not totally eradicated can be seen in the fact that only 3 cases were reported in Ogun State by December 2003 [7] and 24 cases were recorded in this study in 2004. All the head of households, out of which 80.0% had been infected before, considered guinea worm disease a serious problem in their area.

Although drancunculiasis is known to have occurred

in other parts of the state [8] the situation of the disease and conditions sustaining its endemicity in this LGA are distinctive. Odeda LGA is the only LGA in the whole of Ogun State that has a plateau land formation. This bring about an increased relative humidity that usually results in what is known as orographic or relief rainfall i.e. unexpected rainfall [9]. This peculiar factor has made the rainfall pattern of Odeda LGA different from every LGA in the south-western zone of Nigeria. The usual rainfall pattern that is experienced in the western part of Nigeria occurs in the months of April to October every year while November to March marks the dry season periods. However in Odeda LGA, the rainy season occurs in the months of February to November while the months of January and December are the only dry months of the year.

The major reason for the migration of farm labourers into this LGA may be due to the favourable climatic conditions for farming. The immigrant farm labourers in this LGA are from Benue State the most endemic state now in Nigeria [7] therefore posing a danger of importation of the disease into Ogun State.

This study shows that majority of the respondents in Odeda LGA still depends on ponds throughout the dry and rainy season and treatment of drinking water is poor. Geological reports [9] certified Odeda LGA as being formed on basement rock and at every 15 m^2 below the soil surface, the area is covered with montimonlite granite and caolite. The soil surface also contain silicon and zinc which constantly pollute the underground water, hence making well water salty and hard therefore undesirable to rural dwellers. This could explain why the villagers complained that the well-water has a bad taste and hardly use them.

It was observed that the Global 2000 field officer in charge of eradication activities in this area did not visit the villages regularly. It was also observed that the filters given to the villagers were used for sieving grounded maize rather than drinking water. Boiling and filtering of water is not well practised in this area. Addition of alum to drinking water as practised by respondents will not kill cyclopoids but, according to [10] make the dirtís in the water as well as the infective copepods settle to the bottom of the water.

Belief or ignorance is a major factor militating against the total eradication of guinea worm disease in the LGA. Belief is a serious impediment to the success of most health programmes in developing countries [11, 12]. Respondents could not understand the direct connection between the water they drink today and the disease they suffer the next year. The respondents that have never been infected before believe that the infection is not from the water source. A man in Ikija Village claimed that he was born in Ikija and had been drinking the water other infected people drink but was not infected until he got married at age 30. He said he was so unfortunate to have married a woman from a family in which guinea worm is their family disease (the belief is that every family has a disease peculiar to it). He said he got infected a year after he got married due to blood contact during sexual intercourse.

Respondents are ignorant of the fact that some people escape infection and that not all guinea worm come out of the body. Some of the respondents never infected before claimed to have movement of worm all over their bodies and they called it 'a blind guinea worm' while some others claimed to have noticed swellings that looked much like guinea worm swellings on their bodies. These findings conform with the work of Falode in Akinyele LGA of Oyo State, Nigeria, [12]. By further probing the respondents, it was found out that some of them who believed guinea worm infection is through the use of bad water did not really understand the transmission cycle of the disease. They believed that guinea worm is washed into their drinking water source by flood after the rains. Others were of the opinion that certain whitish worms that move about in the water in the rainy season are the major cause of the disease when they penetrate the skin of anybody who immerses his or her leg into the pond.

Ignorance of the respondents is further shown when 77.5% of the respondents did not know if guinea worm disease can be prevented. Only 22.5% stated taking good drinking water as preventive measure out of the 20% that said it can be prevented.

The unavailability of safe sources of water, the high level of ignorance about the cause, transmission and prevention of the guinea worm disease, the favourable climatic conditions for farming which brings immigrant farmers from the most endemic state in the country into the LGA and apathy on the part of health workers all play a vital role in the continued transmission and persistence of the disease in Odeda LGA. This study shows that to completely put a final end to the guinea worm disease health education must be intensified and made to cover every area and the reasons for the disease persistence in areas still endemic should be ascertained and specifically addressed. There is also need to counter the lack of urgency and increasing complacency of workers and for the indigenous government to rise up to the occasion.

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