Progress In Dracunculiasis Eradication: Ogun State, South-West Nigeria As Case Study

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Abstract: Studies on dracunculiasis at the threshhold of its eradication was carried out in 8 infected and at-risk non-infected villages in Obafemi Owode Local Government Area(LGA) of Ogun State between January and December 2005. Current prevalence status of the villages were determined, pretested and standardised questionnairres were administered to head of households(HOHs) to assess Knowledge, Atitude and Practice(KAP) in the management of guinea worm and water samples were collected for cyclops identification. 158 people were examined in 3 infected villages, cyclopoid copepods were recovered from all ponds in the study villages and 76 HOHs were interviwed. The overall prevalence of infection was 5.07%. There was no significant difference in the prevalence of infection between sexes, 5.04% and 4.76% in the females and males respectively (χ^2 = 0.03,P>0.05).The period of infection coincided with the dry season. Uninfected *Halicyclops* and *Thermocyclops* species of cyclops were recovered. Majority(74.1%) of HOHs in infected and 38.8% HOHs in at-risk villages had been infected before. Most(68.4%) HOHs believe the infection is from drinking water. Filtering of water was mostly practised. Studies show that with persistent eradication efforts the 2009 daedline for eradication of the guinea worm disease from the country will be met. [The Journal of American Science. 2009; 5(4):189-193]. (ISSN 1545-1003).

Keywords : Dracunculiasis, Guinea worm prevalence, Cyclops, Nigeria.

Introduction

Dracunculiasis is one of the oldest diseases known to man. Although it is not a killer disease, it is a disease of high morbidity and complications found mostly in farming populations(Brieger and Guyer,1990). Its health, social, educational and economic cost to the individual, the household and the community which is considerable and it's transmission cycle are well documented (Belcher *et al*,1975; Kale,1977). Key intervention strategies to eradicate guinea worm are safe water supply, vector control using abate, health education and case management.

The complete eradication of the guinea worm disease which is still endemic among the poorest rural communities in areas without safe water supplies in Sub-Saharan Africa will require sustained high level political,financial and community support (Diamenu and Nyaku,1998). There has however been tremendous progress towards the eradication of the disease.The World Health Assembly in 1986 reported that an estimateed 3.5 million persons in 20 countries had the disease and approximately 120 million persons were at risk of infection in 1986. By the end of 2002,annual incidence of the disease had been reduced by more than 98%. The burden of guinea worm disease today occurs in Sudan,Ghana and Nigeria.These three countries account for 93% of all cases worldwide (Department of Health and Human Services,2003).

This study is on the epidemiology of dracunculiasis at the threshhold of its eradication in eight infected and at-risk non-infected villages in Obafemi Owode Local Government Area(LGA) of Ogun State.

Materials and Methods

Study Area

The study area, Obafemi Owode LGA is one of the two LGAs found to be endemic for guinea worm disease in Ogun state, south-west Nigeria. The other being Odeda LGA (Morenikeji and Alade,2006). Obafemi Owode LGA is located between Latitude 6^0 45^1 and6^0 53^1 north of the equator and Longitude 3^0 40^1 and 3^0 54^1 east of the Greenwich meridien. The people in the LGA are predominantly farmers and Yoruba speaking with Egba dialect.

The villages under survey are Agbedi, Jibowu, Olowotedo, Onibata, Oduro, Oluwo oke, Sapala, Makinde, and Eleruja. These villages are known to have a long experience of guinea worm infection. However, at the time of this survey, Agbedi, Jibowu and Olowotedo were the villages infected while the other villages were at risk of infection.They were at risk of infection because they were located around villages infected in

2005,they had been infected before until 2005 and were under surveillance by Global 2000.

Main water sources in the villages include rivers and ponds, deep wells and a borehole in Agbedi. Some villages are supplied water weekly from the LGA office.

Methods

The prevalence of dracunculiasis was determined in the three infected villages after ascertaining that people in the study villages had been residing in the area for at least one year.Prevalence of infection was determined in relation to age and sex and compared to the data for previous year got from Global 2000 Carter Centre,South-West Zonal office,Nigeria.

Questionnaire Administration

Pretested and standardised questionnaires were administered to all heads of households (HOHs) in infected villages and randomly administered to HOHs in villages at risk of infection. Questionaires were used to record the respondents village and demographic information. Source and treatment of water in households was recorded.Their perception of the cause/ seriousness and prevention of the disease was also recorded.

The questions were asked in Yoruba language assisted by Global 2000 field staff and village-based Health Workers (VBHWs). Eradication activities and measures in the villages were noted.

Collection of Water Samples For Cyclopoid identification

Water samples were collected in the evenings when villagers came to fetch water from ponds. Water samples were taken from 7 different ponds in the study area. Agbedi, Olowotedo,Jibowu, and Onibata use a common pond, Semore pond. Other ponds include Ganta and Morocco in Oduro,Iporo pond in Oluwo Ake, Orisunbare pond and Oripako pond in Sapala Makinde and Agodo pond in Efunjo.

Water samples were collected and examined for Cyclops types and infection rates according to methods described by Falode and Odaibo (2002). Morphological identification was done by the illustrated keys of Jeje and Fernando (1986) and Boxshall and Braide (1991).

Data analysis involved frequency and distribution statistics. The results were tested with Pearson's χ^2 to determine variability in the distribution of categorical variables for each study outcome, with an α – level of $P < 0.05$ indicating statistical significance.

Results

A total of 158 people were examined in the three infected vilages under study , 84 males and 74 females. 8(5.07%) were infected, 3.2% in Agbedi, 1.3% in Olowotedo and 0.6% in Jibowu. Out of those infected,4(50%) and 4(50%) were males and females respectively. Although the prevalence in males (4.76%) was lower than females (5.40%), it was not statistically significant (χ^2=0.03,d.f.=1,p>0.05). Infection was found in three age groups; 11-20(37.5%),21-30(37.5%) and 61-70(25%) (Table 1).

The location of guinea worm infection was in the lower limbs. The number of emerging worms was between 1 and 3. Incapacitation lasted for a period of two weeks to a month after the blister bursted. Of those infected, there were four farmers (50%),one trader (12.5%) and three students (37.5%). The cases were recorded in the months of March and April towards the end of dry season. A total of 42 and 13 cases were recorded in the three infected villages in 2003 and 2004 respectively. There were 83 and 15 cases in all in the LGA in 2003 and 2004 respectively, 81% and 90% reduction in the number of cases from 2003 to 2005 in the three infected villages and LGA respectively.

For the KAP studies in the infected and at-risk non-infected villages, 76 households were sampled in 8 villages. 35.5% households in three infected villages and 64.4% in five at- risk non-infected villages. 54(71.1%) respondents were males while 22(28.9%) were females. More respondents were between 61-70 years (36.8%) followed by those aged 51-60 years (18.4%), 41-50(15.8%), 31-40(14.5%), 21-30(7.9%) and 71+(6.6%). Most(71.1%) of the respondents were farmers,17.1% were traders while 11.8% did other things like tailoring and carpentry.

Most (74.1%) of the respondents in infected villages had been infected before while only 38.8% were infected before in the villages at risk of infection. 51.3% had been infected before in all the villages. Majority(76.3%) still consider guinea worm disease a serious problem in their village.

When rerspondents were asked what they perceived as the cause of infection,81.5% of those from the infected villages knew infection was from drinking infected water, while 61.2% knew in the villages at risk of infection. For treatment, apart from the winding of the worm around a stick, most from all villages(69.2%) claimed they used antibiotics while 12.8% used shea butter, another 12.8% used herbs and 5.2% used nothing.

87.2% of those infected before claimed that the infection had very serious effect on their farming activities, 79.5% said effect of infection on their econonmic well being for the period of infection was very high and 71.8% claimed it had very serious adverse effect on their social activities.

Majority (65.8%) of the respondents get their drinking water from ponds, 15.8% from boreholes and a few(18.4%) from the well during the dry season. Some claim to harvest rain water during the rains. The water treatment mostly practised by the respondents that treat water(67(88.2%)) was filtering (85.7%), a few boil(7.1%) and a few(7.1%) add alum to their water.

Table 2 shows the number and the species of Cyclops recovered from a total of 7(5 litres) water samples from the ponds in the infected and at-risk villages. No infected Cyclops were found in all samples. *Thermocyclops* and *Halicyclops* species were recovered from ponds.

Table 1: Age And Sex Distribution Of Persons Infected With Guinea Worm In Obafemi Owode LGA, Ogun State.

	Male		Female		Total	
Age Group (years)	No Examined (%)	No Infected(% Prevalence)	No Examined (%)	No Infected(% Prevalence)	No Examined	No Infected
0-10	11(13.1)	0(0)	10(13.5)	0(0)	21(13.3)	0(0)
11-20	09(10.7)	0(0)	08(10.8)	3(4.05)	17(10.8)	3(37.5)
21-30	10(11.9)	2(2.38)	13(17.6)	1(1.35)	23(14.6)	3(37.5)
31-40	17(20.2)	0(0)	09(12.2)	0(0)	26(16.5)	0(0)
41-50	07(8.3)	0(0)	12(16.2)	0(0)	19(12.0)	0(0)
51-60	10(11.9)	0(0)	08(10.8)	0(0)	18(11.4)	0(0)
61-70	20(23.8)	2(2.38)	14(18.9)	0(0)	34(21.5)	2(25)
TOTAL	84(100)	4(4.76)	74(100)	4(5.40)	158	8(100)

Table 2: Cyclopoid Copepods in Ponds in Obafemi Owode LGA, Ogun State

Ponds	Villages that use the Pond	Species of Cyclops	No present per 5 litres of water
Semore	Agbedi,Jibowu, Olowotedo and Onibata	*Thermocyclops oblongatus nigerianus*	2
Gamta	Oduro	*Thermocyclops oblongatus nigerianus*	9
Morroco	Oduro	*Thermocyclops oblongatus nigerianus*	5
Iporo	Oluwo ake	*Halicyclops korodiensis*	2
Orisumbare	Sapala Makinde	*Halicyclops korodiensis*	18
Oripako	Sapala Makinde	*Halicyclops korodiensis*	12
Agodo	Efunjo	*Halicyclops korodiensis*	15

Discussion

The study shows that dracunculiasis is still present in the study area and it also shows the efficacy of eradication measures in reducing the disease prevalence. This can be seen in the number of infections recorded in the previous years (2003 and 2004) as compared with the present status of infection. The decline in guinea worm cases is commendable. This reduction of cases may be attributed mainly to the provision of safe drinking water to these infected villages. Udonsi(1987) and Hopkins (1998) found similar effects in their studies. However efforts must be intensified to combat the last few cases considering the fact that a small foci of infection can bring about a resurgence of the disease.

The study showed that there was no significant difference in the prevalence of infection rate between males and females ($p>0.05$) which conforms with other reports (Onabamiro,1952; Anosike *et al*, 2001).

The period when cases occured was towards the end of dry season (March and April). This dry season is often associated with the consumption of water from ponds or water holes formed (or dug) in the bed of seasonal rivers when flow has ceased.

In many studies,ponds have been claimed to be the ideal source of dracunculiasis transmision (Onabamiro,1952, Kale,1977). Two species of Cyclops with no infection were found during the period of study probably due to the low infection rate in human population which is due to control measures in place.

The study shows that inspite of alternative water sources in some villages such as boreholes and wells,it is almost impossible to stop villagers from going to the ponds. Most HOHs(81.5%) claimed villagers still drink the infested water without filtering especially on their way to or from the farm. Old villagers stated they prefer the "natural" taste of pond water. The presence of the disease in the infected villages is probably as a result of the three infected villages sharing a common pond.

Some villages that had no other source of water other than the ponds like Oduro with only two ponds (Gamta and Morroco) rely solely on these ponds. Onibata and Jibowu villages relied on water that is supplied to them fortnightly by the Government. Hence, the Government's inability to regularly supply safe water also forces inhabitants to revert to these contaminated ponds at the period of high water needs. The only village that had one functional borehole constructed by the government was Agbedi, being the most infected village.

Most of the respondents think that the infection is caused by contaminated pond water because cases of infection reduced when pond treatment and filtering of drinking water started.

Most of the respondents think all ages are susceptible to the infection as they said there was no age or sex spared at the time of high endemicity. In Agbedi however, a few respondents claimed that females are more susceptible than males.

The eradication measures in the villages include usage of cloth and pipe filters supplied monthly by Global 2000 staff, provision of boreholes and wells, application of abate to ponds and most importantly health education,without which these other eradication measures would have failed.

Filters were seen hung outside each household after usage to dry after washing. Water filters though wildly acclaimed to be cheap and the most simple eradication measure, has to be highly distributed to be highly effective. Village based health workers (VBHWs) were trained in each village to treat their ponds with Abate. They do this on monthly basis as long as Abate is given to them by health officials. As noted by Amali (2000), the intensified Abate treatment in 1999/2000 in Ebonyi and Oziba might have caused more than 90% reduction in the number of cases.

Health education has played the most important role in reduction of the disease to a minimal level. It is very important for the success of every component of the intervention strategies and it is a continuous process. For instance, it was observed that in the endemic communities, series of health education were done to enable the villagers accept the treatment of their ponds with Abate which brought about a reduction in the density of cyclopoid copepod population. The combination of both persistent education to change behaviour patterns and implementation of measures to provide safe water has been shown to be effective in the reduction of the disease in previous studies (Nwobi and Ibe,1996; Hopkins,1998).

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