African Scientist Vol. 4, No. 3, September 30, 2003
Printed in Nigeria

1595-6881/2003 $12.00 + 0.00

http://www.klobexpublishers.com

AFS 2002078/4302

The impact of guinea worm disease on school attendance in Akoko, Ondo State, Nigeria

S. O. Adewole[1]* and A. A. Hassan[2]

[1]Department of Zoology, University of Ado-Ekiti, Ado-Ekiti, Ekiti State, Nigeria.
[2]Department of Zoology, University of Ibadan, Ibadan, Nigeria.

(Received November 7, 2002)

ABSTRACT: Attendance records from all primary and post-primary schools in Akoko areas of Ondo State were examined to relate the rate of missed school days, school drop out rate from 1995 to 1998. During the survey, 9,525; 9,752 and 10,062 pupils (boys and girls) were registered in both primary and post-primary schools in the villages, the prevalence of guinea worm disease among school children were 27.7%; 6.2% and 2.3% in 1995, 1996 and 1997 respectively.

There was a significant reduction ($P<0.05$) in prevalence of guinea worm disease among school children between 1995 and 1997, with the advent of various control programmes. This culminated in a 100% reduction in infection by 1998. At the peak of guinea worm season, in the study area, guinea worm – related absences caused virtually all absenteeism recorded in the schools with 27.7% in 1995 and 0.0% in 1998.

Key words: Guinea worm disease (Dracunculiasis); Absenteeism; Water supply; Akoko; Ondo State; Nigeria.

Introduction

Guinea worm disease was reported to be endemics in most rural villages in Nigeria (Edungbola *et al*., 1988). Efforts to control the infection in Akoko areas of Ondo State had reached an high level. Pipe borne water supply to Akoko areas has not been possible because of the hilly nature of the area. As a result, most of the villagers depended on stagnant water/ponds/pools for domestic and drinking purposes. These collection of surface water serve as breeding site for *Cyclops species*, the intermediate obligate host of *Dracunculus medinensis*, the causative agent of guinea worm infection (Ilegbodu, 1983). Long term disability due to guinea worm infection ranges from 2 months to 4 months due to repeated infection and secondary bacterial infection (Maurice and Sandy, 1994). Ilegbodu *et al* (1986) reported a high prevalence of guinea worm disease which coincides with mid-school year activities and major agricultural activities when the farm lands are cleared manually in preparation for cultivation, planting and harvesting of the essential staple food in Nigeria.

*To whom correspondence should be addressed.

Although many workers have studied the impact of guinea worm disease on agricultural productivity, (Donald *et al*., 1994; Dalton and Parker, 1996 and Edungbola, 1983). Little is known of the effects of guinea worm disease on school attendance (Belcher *et al*., 1975; and Abolarin, 1981). This study reports the impact of the disease on school attendance in Akoko area of Ondo State from 1995 – 1998.

Material and Methods

Study Area: The survey was carried out in Akungba, Supare, Afin, Ogbagi and Ese villages, in Akoko area of Ondo State located in the South Western part of Nigeria situated in the Savanna Zone within Latitude 7°22'N and Longitude 5°35' – 5°55'E (Figure 1). There was no pipe borne water due to hilly nature of the area and majority of the villagers depended on pond/stagnant water sources for domestic purposes. The terrain is tropical rain forest characterised with extensive trees. All the villages are rural, with the absence of most modern amenities.

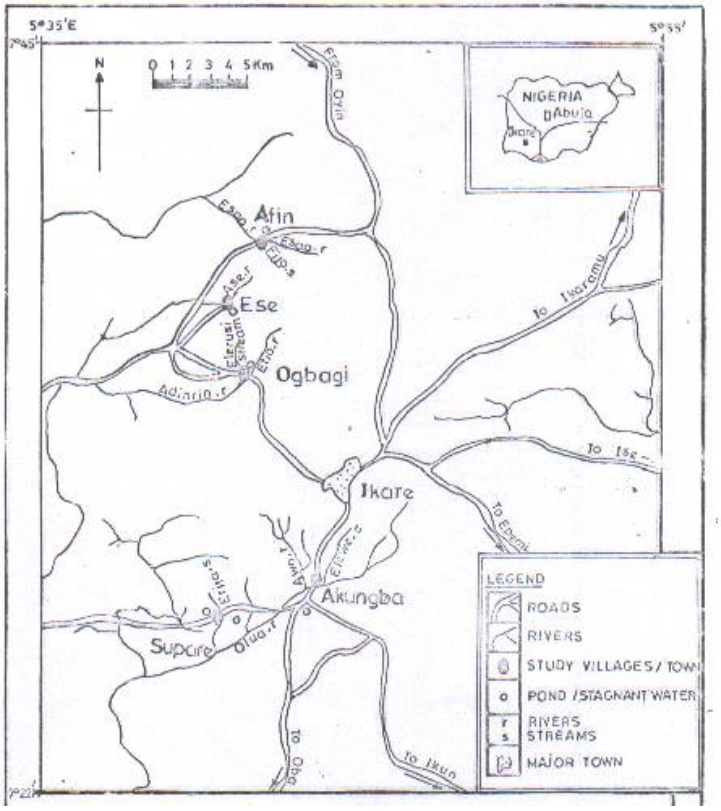

Fig. 1: Map of the five communities surveyed and the locations of rivers, streams, ponds and stagnant water sampled.

The predominant occupation is farming; 65% of the adult males are farmers while 10% are casual workers. Akoko farmers and their families collect their drinking water solely from ponds which contain guinea worm – infected *Cyclops*. There are 17 and 5 Primary and Post-primary schools respectively. During vacations, most of the pupils engaged in farm work.

School Survey

All Primary and Post-primary schools were visited between 1995 and 1998. On the survey day, each pupil present in school was visually examined for a guinea worm lesion or blister and for a palpable pre-emergent adult guinea worm under the subcutaneous tissue according to methods detailed out by (Ilegbodu, 1986). Medical personnel from the Ministry of Health also assisted in the visual examination of pupils. Attendance records of each class during the survey were checked, for duration of absences. Confirmation of cause for absence normally was obtained either from the class teacher or a relative of the infected pupil in the same school. Furthermore, class teachers and school headmasters were individually interviewed to determine the proportion of drop outs each year and the reasons for students leaving.

Results

The percentage of pupils infected with guinea worm from 1995 to 1997 in all the villages are shown in Table 1.

A total of 2,592 (27.7%), 606 (6.2%) and 209 (2.3%) had dracunculiasis during the period under investigation 1995, 1996 and 1997 respectively.

In 1998, 0.0% prevalence was recorded among the school children (Figure 2). The highest number of infected pupils was found at Agbogbo Grammar School where 330 students were infected with guinea worm out of a total of 750 students, representing 44% of the total school population/enrolment. Similar cases were also found in other schools, but it was just 39.2% in Ansaru-deen Primary school.

In Ogbogi, enrolment between 1995 and 1996 in the village primary and post-primary school dropped sharply (Figure 3). Pupils were seen wondering and sitting around in the village helplessly. Also at least 80% of students in post-primary and secondary schools that visited the villages during Christmas holidays did not return back to school at the end of the holiday due to serious guinea worm infections.

Table 1: No registered and percentage of pupils infected with guinea worm from 1995 to 1997.

Village	1995		1996		1997	
	No. of pupils registered	% Infected	No. of pupils registered	% Infected	No. of pupils registered	% Infected
Akungba	2,316	22.2	2,204	4.2	2,001	2.4
Supare	2,543	26.5	2,865	7.1	3,136	1.7
Afin	1,542	25.2	1,545	5.8	1,686	1.7
Ogbagi	1,398	30.8	1,310	6.4	1,517	1.7
Ese	1,726	33.8	1,825	7.5	1,722	3.0

Discussion

The period of high absenteeism recorded in 1995 in all the village may be attributed to ignorance of the causative agent and mode of transmission as well as the delay in the initiation of the various control programs embarked upon later. The villagers before the commencement of this survey, do not appreciate the need to obtain drinking water from protected sources, hence resulted in sending the pupils to infested stagnant/pond water to fetch water for domestic purposes. This is consistent with the observation reported by Nwosu *et al* (1982) and Tayeh *et al* (1993). Important of clean water supply and proper waste disposal

is a difficult concept to teach the pupils in both Akoko primary and post-primary school, because sanitary facilities are absent in the entire villages. Thus, students were seen defecating every where and polluting the stagnant/pond water that serve as habitat for the *Cyclops* – the intermediate host of guinea worm with faeces.

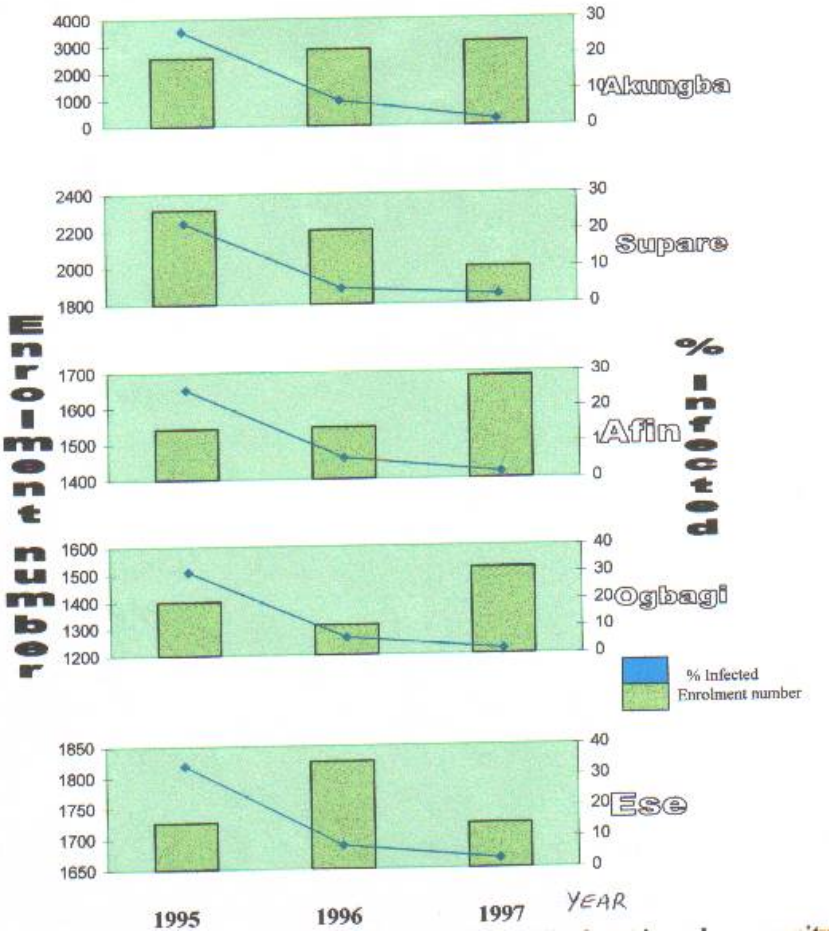

Fig. 2: School enrolment and percentage of pupils absent in each community from 1995 – 1997.

This study found that as a consequence of guinea worm infection, over 28% of Akoko pupils in both primary and post-primary school did not benefit from the educational opportunities provided through the school system. No provision is made for home and individual tutoring to alleviate the suffering of infected pupils. In Nigeria, there is a strong link between literacy and attainment in leadership. For pupils who are chronically infected with guinea worm disease in this survey to optimally benefit from the educational system, education in personal and community hygiene should became an essential component of instruction in primary and post-primary schools in Akokos. Collaboration effort by administrators of education and social service agencies is necessary to provide essential sanitary amenities to promote school health as against the deplorable health conditions recorded in these villages in 1995. Provision of adequate pipe-borne water and toilet facilities in schools and in the villages. Ilegbodu *et al* (1986) had reported a similar observations in Nigeria that dracunculiasis had less impact on children with the provision of toilet facilities and protected water supply.

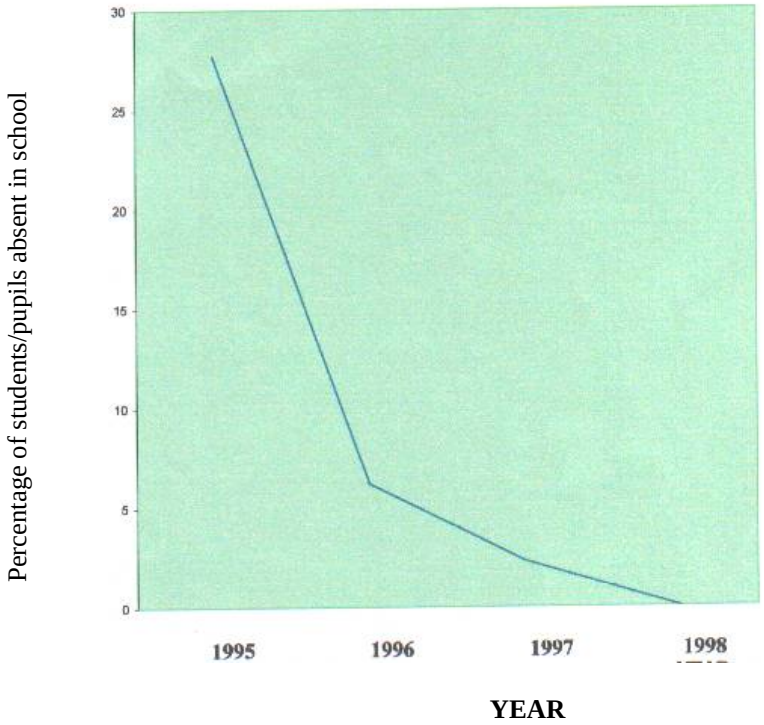

Fig. 3: Level of absenteeism among the school pupils from 1995 – 1998.

The preliminary assessments of pupils in these villages based on the performance of individuals in school, the number of years taken to complete primary and post-primary education and the overall school performance in national and state examinations indicate, that prolonged infections and high rate of absenteeism due to guinea worm are affecting academic performance and educational advancement. Similar to the findings of Edungbola *et al* (1992).

The present study reports poor school attendance associated with guinea worm in the villages. Absenteeism declined as guinea worm season waned and with the initiation of various control programmes. The overall increase in school enrolment recorded in 1997 could be attributed to the decline in the prevalence of guinea worm. Also, parents living in towns and cities were willing to send their children back to the school, without the fear that the children would become victims of guinea worm or withdrawn from school to perform domestic tasks. Similarly, parents previously suffering from guinea worm were now healthy and no longer recalled their children from school to provide domestic support.

The transmission cycle of guinea worm disease is known to be interrupted in a relatively short period when protected water supply is provided to the villages under investigation. Edungbola (1983) had reported similar observation in an academic villages of Babana district.

References

Abolarin, M.O. (1981). Guinea worm infection in a Nigerian village. trop. Georgr. Med. 33: 83-88.

Belcher, D.W.; Wurapa, F.K.; Ward, W.B. and Lourie, J.M. (1975). Failure of Thiabendazole and mentroniazole in treatment and suppression of guinea worm disease. Am. J. Trop. Med. Hyg. 19(1): 215 – 219.

Donald, W.B.; Fredrick, K.W.; William, B.W. and Irvin, M.L. (1994). Guinea worm in Southern Ghana: Its epidemiology and impact on agricultural productivity. Am. J. Trop. Med. and Hyg. 24(2): 107 – 117.

Dalton, G.E. and Parker, R.N. (1996). Agriculture in South West Ghana. Volume IV, Special Studies, Development Study No. 13, University of Reading, Department of Agricultural Economics and Marketing.

Edungbola, L.D. (1983). Babana parasitic diseases project II. Prevalence and Impact on dracontiasis in Babana District, Kwara State, Nigeria. Trans. of the Royal Society of Tropical Medicineand Hyg. 77(3): 310 – 315.

Edungbola, L.D.; Watt, S.J.; Alabi, T.O. and Bello, A.B. (1988). The impact of a UNICEF assisted rural water project on the prevalence of guinea worm disease in Asa, Kwara State, Nigeria. Am. J. Trop. Med. and Hyg. 39(1): 79 – 85.

Edungbola, L.D.; Withers, P.C.; Braide, E.L.; Kale, O.O.; Sadiq, L.O.; Nwobi, B.C.; Alakija, T.; McConnon, P. and Hopkins, D.R. (1992). Mobilization strategy for guinea worm eradication in Nigeria. Am. J. Trop. Med. Hyg. 47(5): 529 – 538.

Ilegbodu, V.A. (1983). Socio-environmental factors association with the distribution of DRACUNCULUS MEDINENSIS (Guinea worm disease) and suggested methods for control, Ibarapa, Nigeria. Ph.D. Dissertation, The University of Texas School of Public Health.

Ilegbodu, V.A.; kale, O.O.; Wise, A.A.; Christensen, B.L.; Steele, J.H. (Jr.); Chambers, L.A. (1986). Impact of guinea worm disease on children in Nigeria. Am. J. Trop. Med. 35: 965 – 964.

Maurice, I.I. and Sandy, C. (1994). Long term disability due to guinea worm disease. trans of the Royal Soc. of Trop. Med. and Hyg. 88: 559 – 560.

Nwosu, A.B.C.; Ifezulike, E.O. and Anya, A.O. (1982). Endemic dracontiasis in Anambra State of Nigeria: geographical distribution, clinical features, epidemiology and socio-economic impact of the disease. Annals of Trop. Med and Parasit. 76: 187 – 200.

Tayeh, A.; Cairncross, S.; Maude, G.H. (1993). Water sources and other determinations of dracunculiasis in the Northern Region of Ghana. J. of Helm. 67(3): 213 – 215.