Bioscience Research Communications
Vol. 15, No. 2, April 30, 2003
Printed in Nigeria

0795-8072/2003 $12.00 + 0.00

BRC 2002008/15201

Dracunculiasis: age and sex as important biological risk factors influencing the transmission in Akoko, Ondo State, Nigeria

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

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

(Received July 3, 2002)

ABSTRACT: Transmission of dracunculiasis (guinea worm disease) with respect to age and sex was studied in Akoko, from 1995 to 1997. The overall infection rates in males subjects in Akoko area for 1995, 1996 and 1997 were 57.2%, 42.5% and 19.9%, while females had 57.8%; 30.4% and 18.8% respectively. There was a significant ($P<0.05$) reduction in the infection rates between males and females from 1995 – 1996; 1996 – 1997 and 1997 – 1998 (post survey). However, the observed differences between male and females subjects was not significant ($P>0.05$). The annual prevalence of infection in relation to age and sex in each village were also included. The highest infection rate was recorded in the 30 – 39 age cohort and the lowest infection rate in 0 – 9 age cohort.

Key words: Guinea worm diseases/Dracunculiasis, Age, Sex, Prevalence, Transmission, Akoko.

Introduction

There were indication that dracunculiasis was increasing in prevalence and importance prior to the recent control intervention, Education *et al* (1992). Edungbola (1984) reported that in the rural areas, dracunculiasis persists as a major health problem with enormous socio-economic consequences. Such rural set ups are characterised by non-available of pipe borne water or deep wells thus, water is obtained from stagnant ponds/pools that dried up almost completely during the peak of dry season. Water collection from the roof – drain provides a supplementary source during the rains. Ignorance of the causative agent and mode of transmission of the diseases is a major problem among rural dwellers (Hopkins and Hopkins, 1992). Suitable condition for human infection occur where water for drinking is obtained from stationary bodies of water such as ponds, large open wells (Muller, 1979), cistern and small open scale dams (Bierlich, 1995) and taken untreated. In previous studies, contaminated palm wine containing the right species of guinea worm infected Cyclops (crustacea: copepoda) was noted to be a common source of transmission.

*To whom correspondence should be addressed.

The age and sex distribution of persons infected vary a great deal (Ukoli, 1990). Guinea worm infection, though a rarely lethal diseases, is one of the most economically significant disease of man-kind (W.H.O., 1993). Although some studies have been carried out on the epidemiology of dracunculiasis in Nigeria (W.H.O., 1993) little or no report pertaining to age and sex as influencing factors in the transmission of the disease was encountered in literature. hence, this study was designed to determine the transmission pattern in relation to age and sex factors.

Materials and Methods

This study was carried out in Akungba, Supare, Afin, Ogbagi and Ese, Ondo State, in the South – Western part of Nigeria, situated in the Savanna Zone within Latitude 7° 22'N and Longitude 5° 35'E – 5° 55'E. The climate is hot and humid, with small seasonal and daily variations. The rainy season usually starts in April and ends in early November with a short break in August, but there is considerable variation in rainfall from year to year.

The survey was conducted on a house – to – house basis between 1995 and 1997. 694 (1995); 738 (1996) and 769 (1997) questionnaire data sheets were designed to obtain data on name, age, sex, occupation, marital status, state of origin, source of drinking water, the number, anatomical location, severity and history of previous infection.

The questionnaire were distributed to individuals. The number of infected male and female were estimated from the field of observations.

The number infected in various age cohort: 0-9; 10-19; 20-29; 30-39; 40-49; 50 and above with respect to sex was also estimated. Percentage infected or prevalence rate was determined as detailed out by W.H.O. (1993).

Results

The overall prevalence of infection by sex in 1995, 1996 and 1997 in the five villages are shown in Figs. 1 – 5.

The total infection rate in the five villages for males was 57.2% in 1995; 42.5% in 1996; 19.9% in 1997 while females had 57.8% in 1995; 30.4% in 1996 and 18.8% in 1997. Although the males had higher infection rate than the females, there was no significant difference between male and female susceptibility to infection ($P > 0.05$). The annual prevalence of infection by age and sex in the villages are also shown in Figs. 1 – 5.

The age group where the highest infection rate was noticed was in the 30 – 39 age cohort followed by the 10 – 19 and 40 – 49 age cohort while the lowest infection rate was observed among the tender grade 0 – 9 years.

Discussion

In the recent times, age, sex, and occupation had been suspected to play a significant role in the susceptibility of people (inhabitants) to infection (Ehigie and Bayo, 1996). The low incidence of guinea worm disease found among children under ten years than among the older subjects could be due to the fact that children generally take in small volume of water which may lower the chances of ingesting infected Cyclops (Nwosu *et al*., 1982). Also, low incidence could largely be due to the nature of care and pampering given to the young ones which has profoundly reduce their exposure to infection, otherwise they constitute a highly vulnerable group quite susceptible to infection. The low incidence of guinea worm disease found among the elderly people, above 50 years could be explained by their proximity to their farmlands. The elderly ones shifted focus to nearby farm land and avoided trekking to farm which used to

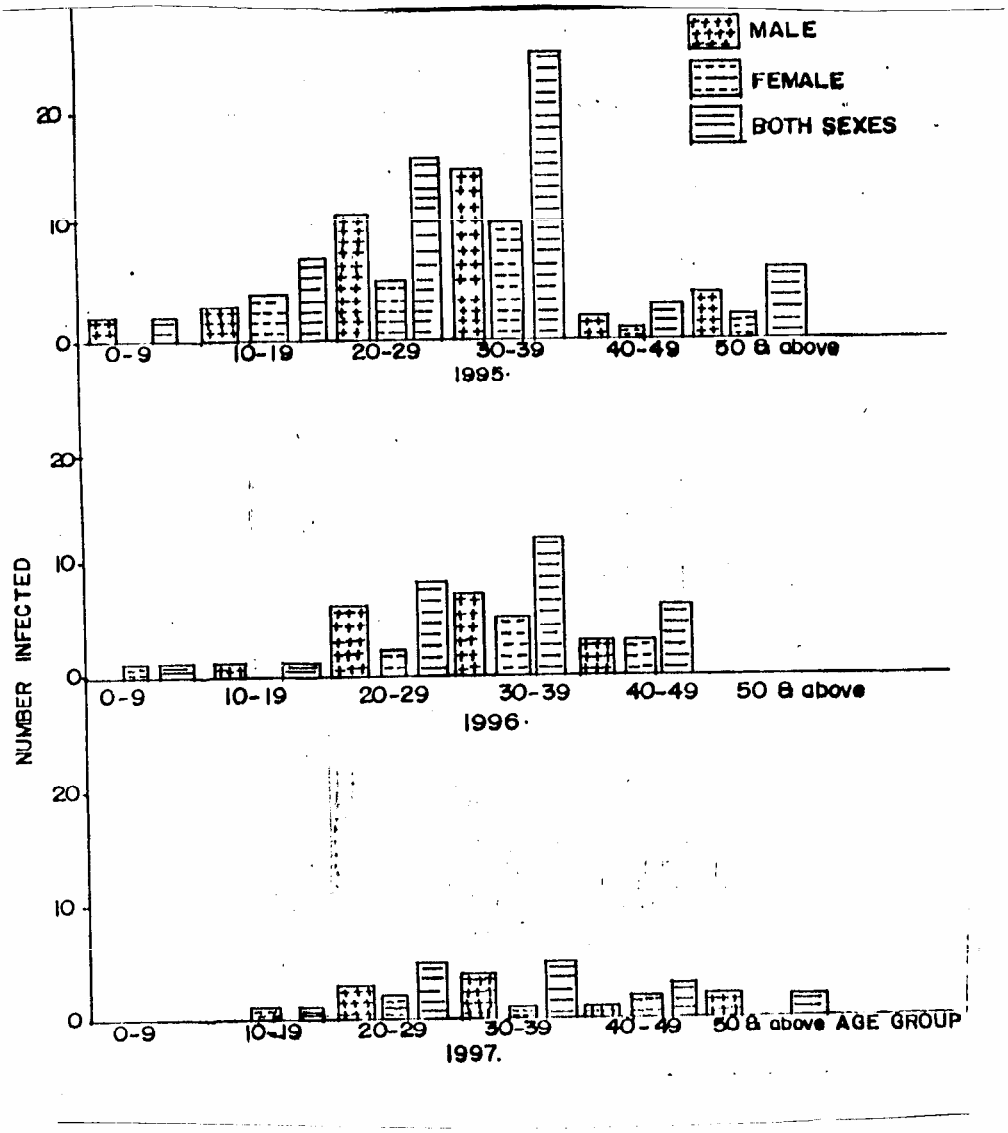

Fig. 1: Prevalence of infection in relation to age and sex in Akungba from 1995 – 1997.

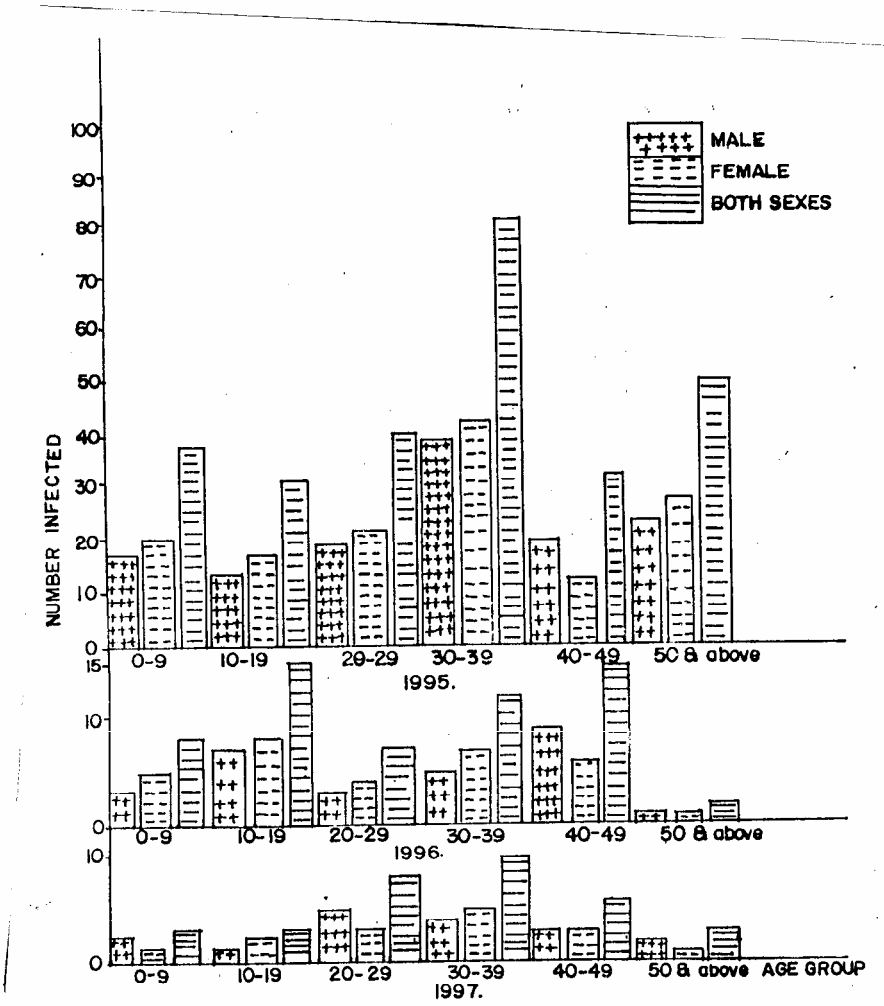

Fig. 2: Prevalence of infection in relation to age and sex in Supare from 1995 – 1997.

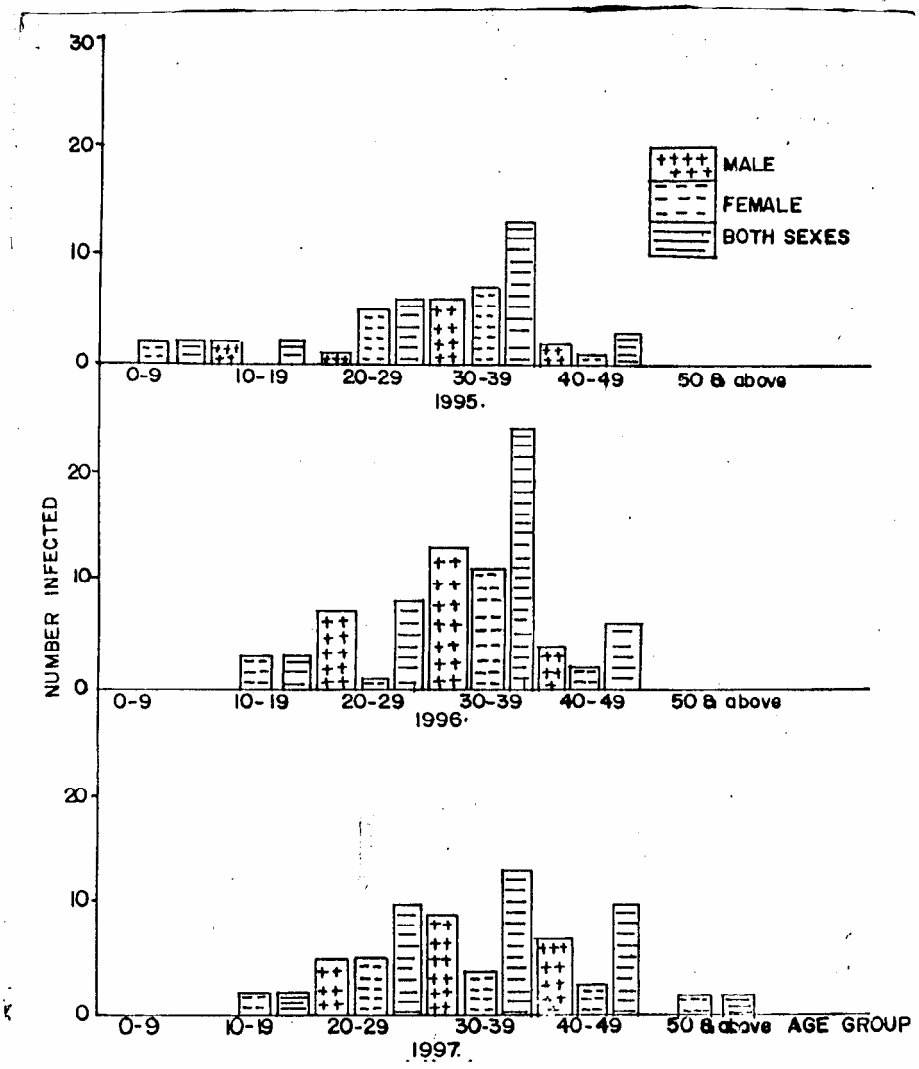

Fig. 3: Prevalence of infection in relation to age and sex in Afin from 1995 – 1997.

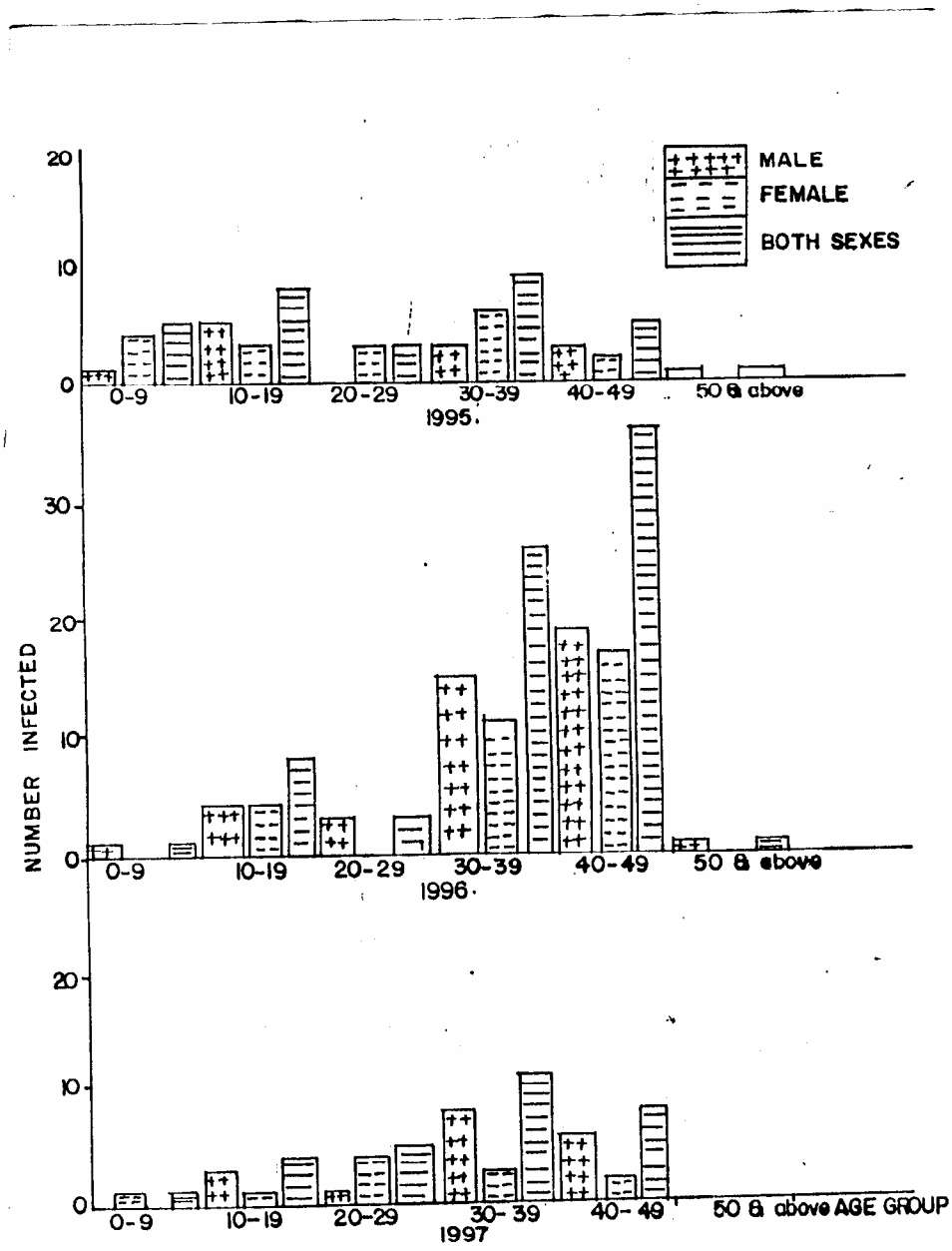

Fig. 4: Prevalence of infection in relation to age and sex in Ogbagi from 1995 – 1997.

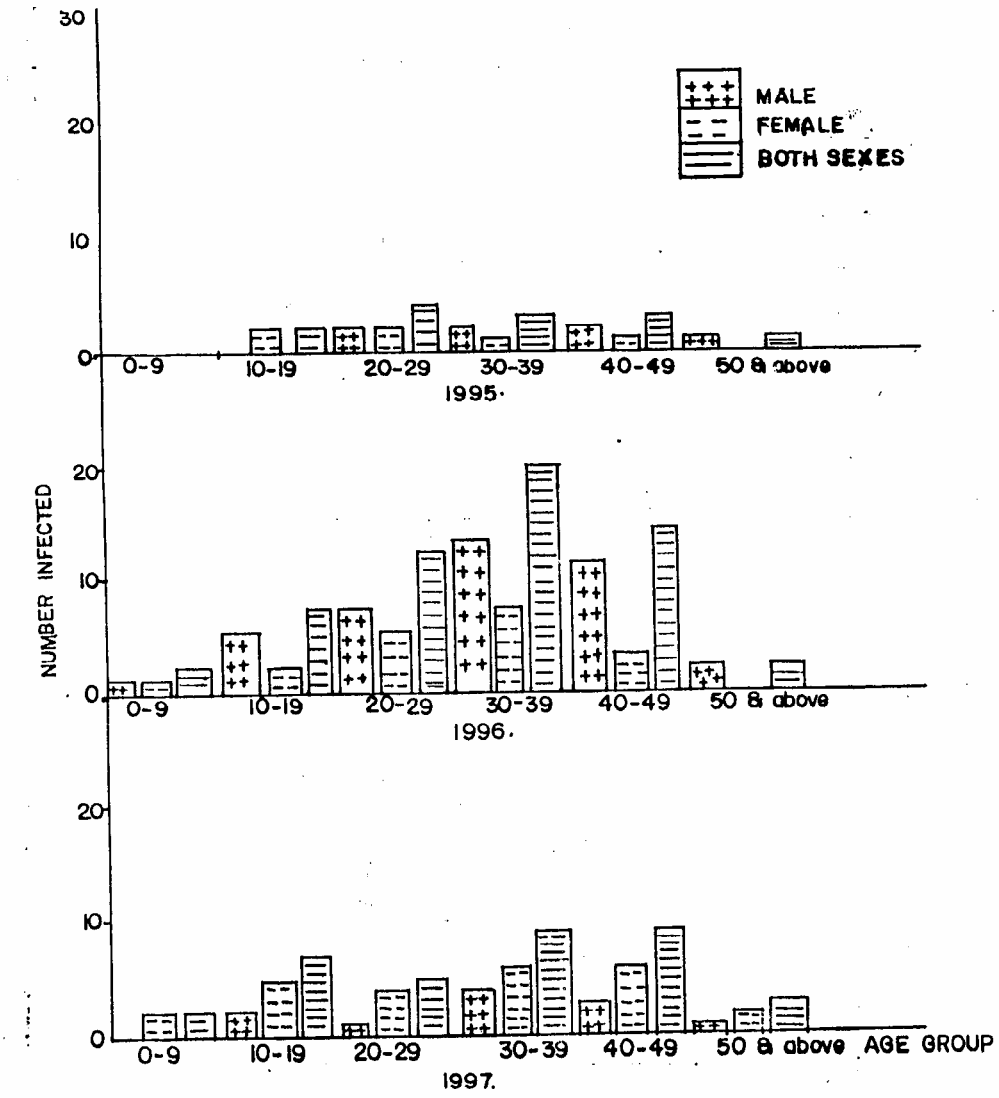

Fig. 1: Prevalence of infection in relation to age and sex in Ese from 1995 – 1997.

be the practise in the youthful days, regular contact with pools/stagnant water was hence reduced and indirectly the level of incidence was affected.

However, the highest incidence, 52%, was found among adults whose age ranged between 30 – 39 years while lower incidences were recorded in the 10 – 19 (11%); 40 – 49 (11%); 20 – 29 (12%) years age group. This finding could be attributed to the fact that adults engage in a lot of strenuous activities like farming, which often result in loss of fluid. Consequently, the volume of water required in the bodies for sustainance is increased. The 30 – 39 age group are the most economically active category and are most highly subjected to guinea worm infection. This is consistent with observations reported by Lyons (1972) and belcher *et al* (1975). Apart from the fact that this group of people often engage in work requiring serious physical exertion, there are various ways by which adult males can contact infections, such as drinking palm wine diluted with contaminated water, eating of local food "fufu" and drinking directly from contaminated source on the way back from their farm (Contact, 1991).

The observed higher infection rate in the males than in the female may be due to the fact that females being the "weaker sex" engage in less strenuous activities than their male counterparts, consequently, becomes less dehydrated than the males. Furthermore, according to Muller (1979) and belcher *et al* (1975), water intake capacity is expected to be less than that of males, hence more males than females become infected with guinea worm. Thus, age and sex had been found to be an important biological risk factor for dracunculiasis transmission in this study.

ACKNOWLEDGEMENT: We wish to express our profound gratitude to Mr. Ajofoyinbo (indigene of Akoko), officials and water and sanitation agency and health officers from Ministry of health, Ondo State. Also thanks are due to Prof. (Mrs.) Egunjobi O. and Mrs. Adewole. J.M. for field and secretarial assistance.

References

Belcher, D.W.; Wurapa, F.K.; Ward, W.B. and Lourie, I.M. (1975). Failure of thiabendazole and metronidazole in treatmentand suppression of guinea worm disease. Am. J. trop. Med. Hyg. 10((1): 215 – 219.

Bierlich, B. (1995). Notions and treatment ofguinea worm in Ghana. Social Sci. and Med. 41(4): 501 – 509.

Edungbola, L.D. (1984). Dracunculiasis in Igbon, Oyo State, Nigeria. Am. J. of Trop. Med. and Hyp. 87: 153 – 158.

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

Ehigie, W.E. and bayo, D.P. (1996). Human ecological factors influencing the endemicity of dracunculiasis in some Nigerian rural villages. Department of Epidemiology and Community Health, University of Ilorin, 4, 106 – 111.

Hopkins, D.R. and Hopkins, E.M. (1992). Guinea worm: the end in sight. Medical and health Annual, Chicago: Encyclopedia Bristannica Inc., 10 – 27.

Lyons, G.R.L. (1972). Guinea worm infection in the West District – 200.

Muller, R. (1979). Guinea worm disease: epidemiology, control and treatment. Bull. Wld. Hlth. Org. 57(5): 683 – 689.

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

Ukoli, F.M.A. (1990). Introduction to Parasitology in Tropical Africa. John Wiley and Sons Ltd., 404pp.

World health Organisation (1993). Dreacunculiasis: global surveillance summary, 1992. Wkly Epidemiol. Rec. 68: 125 – 131.