

## Dracunculiasis (Guinea worm) and public health situation in Nigeria

L.O. Onyekakeyah (\*)

### Abstract

Dracunculiasis is a waterborne disease endemic to many parts of Nigeria, especially in rural areas. *Dracunculus medinensis* (guinea worm) is a long slender round worm that parasitizes man and other mammals. It lives in body cavities beneath the skin (often arm or leg). When mature the female (nearly 120 cm long) migrates to subcutaneous tissues and produces millions of active larvae. A blister appears on the skin of the host, and when the opening comes in contact with water the larvae are swept away and are eaten by tiny crustacean (cyclops) from where their development continues. Man and other mammals are infested when they ingest the crustacean by drinking untreated water. Epidemiological and clinical features are described. The effects of the disease in the population are given with especial emphasis on the social and economic aspects. Eradication measures are indicated.

Key words: *Dracunculiasis*, guinea worm, public health, Nigeria.

### Resumen

#### *Dracunculiasis (Lombriz de Guinea) y la situación de la salud pública en Guinea*

La Dracunculiasis es una enfermedad transmitida por el agua endémica a muchas partes de Nigeria, especialmente en las áreas rurales. *Dracunculus medinensis* (lombriz de Guinea) es una lombriz o gusano redondo largo que parasita al hombre y a otros mamíferos. Vive en cavidades debajo de la piel (generalmente brazos y piernas). Cuando madura la hembra (cerca de 120 cm) emigra a los tejidos subcutáneos y produce millones de larvas. Una llaga o úlcera aparece en la piel del huésped y cuando la abertura entra en contacto con el agua, las larvas son esparcidas y luego comidas por crustáceos diminutos (cíclopes) en donde continúa su desarrollo. El hombre y otros mamíferos se infestan cuando ingieren los crustáceos, al beber agua no tratada. Se describen las características epidemiológicas y clínicas. Se mencionan los efectos en la población con énfasis en los aspectos sociales y económicos. Se indican las medidas de erradicación.

Palabras claves: *Dracunculiasis*, lombriz de Guinea, salud pública, Nigeria.

### Introduction

Water is a universal solvent, thus, it is rare to find absolute pure water in nature. There are physical, chemical and biological contaminants always present in water. It has long been recognised even before the microbial etiology of disease was known that water can serve as a medium for the transfer of disease. Among the diseases and state of ill-health that are associated with water are the following: diarrhoea, enteric fever, dysentery, cholera, bilharzia (Schistosomiasis), guinea worm (dracunculiasis), river blindness (onchocerciasis), among others. Lack of potable water promotes the

survival and multiplication of the vectors and agents of these diseases.

Dracunculiasis which is one of these waterborne diseases is endemic in many parts of Nigeria. According to the Federal Ministry of Science and Technology, nearly all the states in the federation are now affected by guinea worm. In all the affected areas, the disease is seen to be concentrated in the rural communities. The communities have one thing in common, and that is, lack of potable water supply. The inhabitants make use of stagnant water such as ponds and puddles which collect during rains, or which persist because of bad

drainage. Unfortunately, these stagnant water are the breeding sites for the guinea worm cyclop. the number of victims has therefore continued to increase over the years. Based on reports from the States an estimated 2.5 million people are now victims of the disease. These people are severely incapacitated with serious health, socio-economic consequences on them and their families.

Following the declaration of the years 1981-1990, as the International Drinking Water and Sanitation Decade by the WHO, a number of activities and programmes have been initiated by the government of the states affected by guinea worm disease. Major among which is the provision of potable water as a first step towards the eradication of the disease. A target date of 1995 has been set by the states, the date during which at least the country would be completely free from the disease.

Our aim in this paper to make an assessment of the state of guinea worm disease in Nigeria which has become a public health issue for now and the future. It is also to raise public awareness of this situation as a way of attracting more attention towards solving the problem.

### The Problem

Nigeria's population is presently put at around 89 million people. More than 70 percent of this number live in the rural areas. The rural areas are problem-prone, without basic social amenities such as health centres, hospitals, water, among others. In the absence of potable water supply, the inhabitants resort to the use of unhealthy sources of water supply such as ponds, streams, hand-dug wells and similar natural sources which are incidentally infested with guinea worm larvae. The people bath, drink, wash, and cook with the untreated water. It is through these contacts that they get affected with guinea worm disease.

The problem of rural water supply has although been recognised, it has never received

the desired attention. The poor ruralites apparently live and die with it. The incidence of water-borne diseases is an important medical problem in many rural communities of developing countries. According to WHO (1984), 630,000 people die yearly from contaminated water.

The issue of water provision has never been an easy or rewarding task for different governments. As the population keeps increasing, the domestic and industrial water consumption increase in the same proportion. As Tinker (1984), rightly observed, traditionally, the number of hospital beds per hundred thousand people has been regarded as a fairly good measure of public health services. In 1980, ... the WHO suggested that the number of taps might be a better measure of public health than the number of hospitals. There was some truth in this; water-borne diseases kill 30,000 children every day, and are probably responsible for 80 percent of the illnesses in the world. Clean, uncontaminated water is rightly regarded as one of the main objectives of development policy.

In the light of this observation, Nigeria's problem is double-edged: firstly, there is lack of potable water supply, and people make use of unhealthy sources of water through which they are affected by guinea worm disease. Secondly, victims of the disease receive little or no medical attention due to lack of health facilities in the rural areas. This is the crux of the problem which we are facing and which require urgent attention.

### Life Cycle of Dracunculiasis

*Dracunculus medinensis* (guinea worm) is a long slender round worm that parasitizes man and many other mammals. It usually lives in the body cavities beneath the skin (often arm or leg). When mature, the female, which may be nearly 4 ft (120 cm) long migrates to the subcutaneous tissues and produces not eggs, but millions of active first larvae. A



Local inhabitants depend on streams for water supply through which they contact guinea worm.

Photo: L. O. Onyekakeyah.

blister or opening then appears on the skin of the host, and when the opening comes in contact with water, the larvae are swept away and are eaten by tiny freshwater crustaceans called cyclops, from where their development continues. Man and other mammals are reinfested when they ingest the crustacean by drinking the untreated water.

### **Epidemiological features**

Guinea worm is associated with the following epidemiological features: The disease is usually restricted to the poor rural communities whose main occupation is agriculture. The prevalence of the disease in such areas is due to lack of potable water supply, hence, these communities depend mainly on untreated surface water supply. The disease affects both sexes, but males are more affected because they have greater rate of exposure. All age groups are affected with the exception of infants. It has an

incubation period of about 10 -14 months. In many families, multiple cases of infection may be reported. Generally, guinea worm is prevalent in drier areas with low water table and it is reported more during the dry season. While some members of a family may suffer from year to year, others may escape. The worms are expelled from the body without treatment usually in 3 -4 weeks.

### **Clinical Features**

Based on field investigations, clinical characteristics of the disease include:

1. More than 80 percent of all infections affect the lower limbs from where worms emerge.
2. On the average, the number of worms are between 1-2 per person, however, as many as 24 worms have been reported in some individuals (Ogunye, 1988).

3. There may be secondary complications involving bacterial infections, arthritis, ankylosis of the joints and abscess formation.

4. Occasionally, infection by tetanus may occur.

5. Sufferers are incapacitated from work for periods varying between 2-3 months on the average.

### Treatment

Two methods of treatment are followed in the treatment of guinea worm disease. These are the specific and non-specific methods. Specific treatment consists of measures directed at the parasite, usually with the aim of inducing speedy elimination of the adult worm from the body and healing of ulcers. This includes the use of such drugs as nitridazole, metronidazole, thiabendazole and mebendazole (Edungbola et al. 1980; Kale, 1977).

The non-specific treatment consists of local dressing of ulcers, treatment of secondary bacterial infections with antibiotics and chemoprophylaxis against tetanus. Sometimes, analgesic and anti-inflammatory drugs are administered to relieve painful symptoms.

Apart from these orthodox methods of treatment, there are some traditional beliefs attached to the disease which complicate its treatment. For example, some local people believe that guinea worm disease is a punishment from the gods, and as such should not be treated with orthodox medicine. Majority of the people apply palm oil to open skin lesions and thereby help in extracting the adult worm by gradually winding it out on a suitable stick. This method is widely practised by the people but it is less effective.

### Effects of the disease

The incidence of guinea worm in Nigeria has become widespread. About 2.5 million people are infected yearly, and about half of

these are temporarily disabled while about 1,200 are permanently disabled. Altogether, about 50 million man-days are lost yearly by farmers and about 40 million days are lost through school absenteeism as a result of the disease (Nwosu, et al 1982; Edungbola, 1984; Zlegbodun, et al 1986). Within the affected families, there is disruption of domestic lives. For example, affected mothers are unable to look after the home, while the fathers maybe incapacitated. This could force their children to drop out of school and food production for family sustenance maybe hampered. Besides, many government workers refuse transfer to endemic areas. Generally, social and economic progress are affected, which make affected communities to be backward in terms of development. According to one report, a whole community was sacked following an outbreak of guinea worm disease. The socio-economic and psychological impacts of the disease on the affected people cannot be over-emphasized. The effects are better seen than described.

### How to eradicate the disease

A number of control strategies are being followed in the eradication of guinea worm disease (Sehgel, 1988). In Nigeria, the steps being taken to eradicate the disease include a combination of the following control measures. They are:

1. **Case search operations**, involving active search operations of the victims specially during the peak period of May-June, and during the lean period, November-December. Plan is underway to train community health workers and members of the National Youths Service Corps (NYSC), to carry out this job.

2. **Treatment of victims** when a case is detected by the health workers. Since there is no curative drug the assistance given to victims consists of cleaning the ulcers, putting antiseptic dressing and a bandage. Patients are advised to filter all drinking water taken from



The fight against guinea worm is carried out through the provision of pipe-borne water. Children are seen here fetching water from a public tap. Photo: L. O. Onyekakeyah.

antiseptic dressing and a bandage. Patients are advised to filter all drinking water taken from unsafe sources. A patient with ulcer is advised not to enter any water supply source.

**3. Provision of potable water supply.** This is considered the most effective way to stop the transmission of the disease. Under the UNICEF Assisted Water and Sanitation Project, and the World Bank Assisted Rural Development and Water Supply, a number of boreholes have been provided in the affected villages. Many States in Nigeria have so far benefited from these programme, and will continue to benefit from it.

**4. Control of the vector,** under this measure the vector cyclops are killed with an organophosphorus compound temephos emulsion concentrate (EC) 50 percent. This chemical when applied in the unsafe drinking

water source kills the vector cyclops and the water is no longer harmful to any one who drinks it. Some international voluntary organization have assisted the government in this regard. These include Global 2000/BCCI of USA, Rotary International, Lion and Lioness Clubs among others.

**5. Health education,** is another preventive measure that is adopted. Under the nationwide primary health care programme, it is envisaged that community health workers will be mobilized to educate the ruralites in the endemic areas on how to participate in the implementation of control measures. Through this programme, the health behavior of the people is changed.

**6. Manpower training,** appropriate manpower, eg. NYSC, and community health workers will be trained to supervise the

implementation of the foregoing measures.

7. The awareness created at both the Federal and State government levels has set the pace towards the realisation of the guinea worm eradication objective. Thus, at the federal level, a National Plan of Action aimed at achieving eradication of guinea worm disease by December 1995 is being formulated. Hence, for the first time in the history of the disease in Nigeria, government invested ₦0.25 M in 1987, budgeted ₦0.25 M in 1988. The sum of ₦1 million is being set aside for the control of guinea worm annually in the next 5 years National Development Plan beginning in 1989. State governments are not passive to the problem. At least four states have set up task forces on guinea worm control. Nine states also budgeted money for guinea worm control in 1988. With this trend of things the disease is bound to be wiped out at the target date of 1995.

### References

- EDUNGBOLA ET AL. 1980. *Dracunculiasis in Nigeria*, Proceedings of the First National Conference on Dracunculiasis (guinea worm disease) in Nigeria.
- EDUNGBOLA LD. 1984. *Dracunculiasis in Igbon, Oyo State Nigeria*. *Ame. J. Trop. Med. Hyg.* 87: 153-158.
- ILEGBODU ET AL. 1986. *Impact of guinea worm disease on children in Nigeria*, *Ame. J. Trop. Med. Hyg.*, 35 (5): 962-964.
- KALE O O. 1977. *The chiaicoepidemiological profile of guinea worm in Ibadan district of Nigeria*. *Ame. J. Trop. Med. Hyg.*, 26: 208-214.
- NWOSU ET AL. 1982. *Endemic dracunculiasis in Anambra State of Nigeria - Geographical distribution, clinical features, epidemiology and socio-economic impact of the disease*. *Ann. Trop. Med. Parasit.*, 76: 187-200.
- OGUNYE O. 1988. *Guinea worm disease; An overview of the epidemiological situation and status of control in Nigeria*. Paper presented at the 2nd Regional Workshop on Dracunculiasis in Africa, held in Accra, Ghana, 14 - 18 March.
- SEHGEL PN. 1988. *Guinea worm eradication programme in India*, Paper presented at the 2nd Regional Workshop on Dracunculiasis in Africa, held in Accra, Ghana, 14 - 18 March.
- TINKER J. 1984. *Toward an environmentally sound development*. *The Courier*, N° 87, Sept./October, pp. 54 - 59.
- WHO. 1984. *The Guardian Newspaper*, Wednesday, April 4, p.1.

### Conclusion

Our aim in this paper is to examine the extent to which guinea worm disease affects public health situation in Nigeria, like similar primary health care problems, guinea worm is contacted through bad drinking water. Its debilitating effects is rampant in remote rural communities which have no access to potable water supply, and who resort to the use of unsafe water from natural sources. The case is therefore established, and the cure is known, which is provision of potable water.

The common people in Nigeria's rural areas have lived and suffered from guinea worm disease over the years, with no attention from the government. But the trend of things have changed, and a new awareness created to alleviate the suffering of these poor masses. It is hoped that with this new impetus from government and other international voluntary agencies, and the cooperation of the people, the fight against guinea worm disease is a battle that will be won, so that the people can enter the 21st Century with a new lease of life.

# AMOXIVAL®

AMOXICILINA



Presentación

Cápsulas: 500 mg x 6 y 250 mg x 9 — Frasco de 45 ml: 125 mg/5 ml y de 45 ml: 250 mg/5 ml

- \* Antibiótico de amplio espectro
- \* Administración cada 8 horas
- \* Rápida absorción vía oral
- \* Alta concentración sanguínea
- \* Gran potencia bactericida
- \* Baja toxicidad