

AFS 2000070/2304

## Attitudes and Practices Towards Abate Application in a village in Akinyele Local Government Area of Oyo State, Nigeria

O. A. Falode\* and A. B. Odaibo

Department of Zoology, University of Ibadan, Ibadan, Nigeria.

(Received April 30, 2001)

**ABSTRACT:** A study was carried out in Oyeteju Village in Akinyele Local Government Area of Oyo State to determine attitudes of the villagers to treating their drinking pond with Abate (Temephos). The findings showed that all women respondents fetched all their drinking water from the village pond. They all claimed to filter the drinking water, 83.3% claimed to add alum while 25% claimed to boil water. Only 75% knew why Abate was applied to pond despite previous education on Abate. 41.7% support Abate application because it will kill the guineaworm 'germs' in water while 25% support it because it will bring about good health to villagers.

*All the respondents claimed not to be affected by the application of Abate to pond water despite the fact that 33.3% said the pond water turned black while 8.3% said it turned reddish. Their strong belief in their pond which is their god and the colour change did not make the villagers go against the application of Abate to their pond. This was so because health education on Abate preceded its application. It was unfortunate however that the Abate application was not sustained in the village.*

Abate application in this village was accepted as a temporary measure while villagers wait expectantly for their own safe source of water preferably a borehole. The study shows the need for health education to proceed the application of Abate and the need to train villagers on how to apply the chemical in order to sustain the application for effective control.

**Key Words:** Guinea worm; Dracunculiasis; Disease control; Abate; Temephos.

### Introduction

Guineaworm disease which is found in Akinyele Local Government Area of Oyo State (Falode, 1992; Sobande, 1992 and Iyun, 1993), is a disabling, painful, debilitating, water-borne helminthic disease with multiple adverse consequences on health, agriculture, school attendance and the overall quality of life of the affected communities. It is a disease of the poor rural communities in the tropic and sub-tropics (Hopkins, 1983), especially those without safe drinking water (Udonsi, 1987).

Vector control using Abate as a copepodcide (cyclospide) is one of the key intervention strategies in Nigeria. Others are safe water supply, health education and case management (Edungbola, *et al.*, 1994).

---

\*To whom correspondence should be addressed.

Abate is an organophosphorus compound of minimal toxicity that has a molecular weight of 466.4 and an empirical formula of  $C_{16}H_2-O_6P_2S_3$  (Edungbola, *et al.*, 1994). It is available in emulsifiable concentrate as brown viscous liquid or a white crystalline water dispersible powder, with granular formulations (ISG) (Sastry *et al.*, 1978). It has a specific gravity of 1.32, melts at 30.0 to 30.5°C, is insoluble in water and is stable indefinitely at room temperature (Sastry *et al.*, 1978).

The Abate inhibits the production of an enzyme called cholinesterase which is essential for synaptic transmission of nerve impulses in living organisms. The mode of action of Abate as a copepodicide is by selectively causing paralysis and ultimately death of Cyclops through irreversible inhibition of cholinesterase enzymes by alkylphosphorylation (Edungbola *et al.*, 1994).

The organophosphorus compound, Abate (Temephos) have been shown both experimentally and in field trials to be effective and safe (Lyons, 1973; Muller, 1970) for controlling Cyclops in the ponds. Properly applied at monthly intervals, temephos is colourless, tasteless and odourless, with a wide margin of safety (Hapkins, 1983). The American Cynamid announced the donation of Abate to endemic African countries in March, 1990, estimated value was \$2.6 million of which Nigeria can expect about \$1.5 million over five years (Nwobi, 1991).

## Material and Method

Questionnaire on the attitudes and practices of villagers towards Abate application to ponds was administered in Oyeteju Village where Abate was applied to the village pond. This pond was the only source of water in the village. The questionnaire was pre-tested and standardized.

The questionnaire was used to record the respondents name, age, occupation and religion. Information on respondents knowledge about guineaworm and its transmission were obtained. Their source of drinking water, types of water treatment they practice and the usage of filters given were recorded. Perception and attitudes of respondents to Abate application were also recorded.

Questionnaires were administered to mothers in all households in the village by going from house to house in the presence of the village based health worker. The questions were directed to mothers since to a large extent, the burden of problems associated with inadequate water, the duty of boiling and filtering rests on them. The questionnaires were translated into the Yoruba language.

## Results

Oyeteju village has a total of 8 households comprising 45 persons out of which there are 13 mothers. This gives an average of 5.63 persons per household. At the time of study, only 12 mothers were available. Table A shows that most of the mothers fall between the ages of 31 – 40 years (50%), followed by women between 61 – 70 years (25%). There was a respondent each from ages 11 – 20 years and 51 – 60 years.

### Practices

The pond in this village is the village 'god'. In view of this, a man from the village had to plead with the pond amidst the ponds praises sang by the village women before Abate could be applied to the village pond. Charms were seen hung by the pond side.

The women claimed to fetch all their drinking water from the village pond and sometimes collect rain water. All respondents claimed to filter drinking water, 83.3% claimed to add alum while 25% claimed to boil water before drinking (Table B). The monofilament nylon filters were given to all the respondents. The respondents commented that the filters are effective because they sieve so much dirt from the drinking and they do not clog up with dirt.

Water Usage and Attitude to Abate Application in Oyeteju Village.

Table A: Demographic Information and Knowledge About Disease Transmission

No. of Respondents	12(100%)
(i) Age	
11 - 20	1 (8.3%)
21 - 30	-
31 - 40	6 (50%)
41 - 50	1 (8.3%)
51 - 60	1 *8.3%
61 - 70	3 (25%)
(ii) Occupation	
Farming	12 (100%)
(iii) Religion	
Muslim	12 (100%)
"Do you know that guineaworm disease is transmitted through drinking water?"	4 (33.3%)
Yes	
No	-
Dk	8 (66.7%)

Table B: Water Utilisation and Management

Source of Drinking water	
Pond	12 (100%)
Well	-
"Do you treat water from this source?"	12 (100%)
Yes	
Type of treatment	
Boil	3 (25%)
Filter	12 (100%)
Alum	10 (83.3%)
"Were you given filters?"	12 (100%)
Yes	
"Do you use filter to sieve all drinking water"?	12 (100%)
Yes	
"Are the filters given effective?"	12 (100%)
Yes	

*Attitudes*

When the woman respondents were asked if they knew why Abate was applied to pond, 75% said 'Yes' and 25% said 'No' (Table C) despite the fact that they had been educated about Abate before its application to the village pond. All those that said they knew why Abate was applied to pond said it was applied because of the guineaworm disease. All the respondents support the application of Abate to their pond. 41.7% support the application because it will kill the guineaworm 'germs' in water, 25% support it because it will bring about good health. 16.7% support it because the health officials said it is good while 16.7% support its application because it will kill all the germs in the water (Table C).

The respondents said they were not affected by the application of the Abate to their pond. When they were asked how the Abate application affected the pond water, 58.3% said the water was not affected, 33.3% said the pond water turned black after Abate application and 8.3% said it turned reddish (Table C).

Apart from the colour change, the women said there was no change in the taste of the water and no offensive smell. All the respondents supported the application of the Abate to the pond every 4-6 weeks. (Table C). Generally, the respondents appreciated the use of the Abate as a measure against the control of

dracunculiasis and they did not complain about the colour change in water which was a couple of days after application. They said they put alumor certain leaves to clear the water.

Table C: Perception and Attitude to Abate Application

"Do you know why Abate is applied to pond?"	
Yes	9 (75%)
No	3 (25%)
If Yes, Why?	
Because of guineaworm	9 (100%)
"Do you support the application of Abate?" Yes	
	12 (100%)
Why?	
It will kill guineaworm germs	5 (41.7%)
Good for health	3 (25%)
Because we are to it is good	2 (16.7%)
It will kill germs	2 (16.7%)
"Were you affected by the Abate application?" No	
	12 (100%)
"How die the Abate application affect the water from the pond?"	
Turned black	4 (33.3%)
Not affected	7 (58.3%)
Turned reddish	1 (8.3%)
"Do you mind if Abate is applied to your pond every 4 – 6 weeks?" No	
	12 (100%)

Table D: Responses to other water related problems

"Do you go to nearby villages to fetch water from borehole?" No	
	12(100%)
If No, Why?	
Too far	7 (58.3%)
We have our own pond	3 (25%)
We want our own well	2 (16.7%)
"Would you like a borehole in your village?"	
Well	
Borehole	12 (100%)
"Why didn't villagers through self-help construct a well themselves?"	
Tried but did not get water	10 (83.3%)
Dk	2 (16.7%)

Abate was applied towards the evenings on the occasions it was applied and the villagers did not mind waiting till the next day before fetching, infact they barricaded the pond after application so that other villages would know it was not to be fetched. This was necessary in order to allow the temporary colouration, odour or taste imparted by Abate to be dissipated. When women respondents were asked if they go to nearby villages to fetch drinking water from borehole, they all answered 'No' and gave reason, 58.3% said the nearby villages are too far, 25% said their village pond is good enough for them for the mean time before they get their own well and 16.7% wants their own well (Table D). When they were asked if they would like a well or a borehole, all the respondents preferred a borehole.

## Discussion

The focus community in this study, Oyeteju village is a small one, but despite this, it represents the set up of most villages in the state. It shows how a village will react to the application of Abate especially when the village had been previously educated on reasons for its application. The villagers accepted and complied with its usage and actively participated in its application to the village pond.

In this village, it was not only the people that needed to be shown reason for Abate application. Before the pond could be treated, one of the men from the village going into the middle of the pond, had to plead with the pond not to dry up because of the Abate treatment. He further explained to the pond that the Abate was applied to kill the guineaworm germs. This was necessary since they viewed their pond as a sort of god, a faithful god that had provided them with water all year round and nursed their babies for them. These facts were also pointed out in the ponds praises sang by the village women. The villagers reverend the pond and believe that as long as the fishes in the pond are not caught, it will not dry up. A charm was hung at the pond side on one of the visits to the pond. This charm, as the village chief claimed, will remind people not to touch the fishes in the pond. He said if the fishes are not caught even if the pond is about to dry up, there will be rain. On the other hand, if the fishes are caught, they will not cook no matter how long they are cooked and the person that caught the fishes will swell up.

Their strong belief in the pond which would have hindered Abate application did not however pose any problem since villagers had been previously educated about the Abate application. The fact that most villagers do not understand the mode of transmission of the disease did not pose a problem either. This study as in the study by Edungbola *et al.*, (1994), demonstrates the importance and relevance of mobilizing the community and of launching health education campaigns (in order to remove ignorance through public awareness) before a rational use of the vector control strategy for endemic tropical diseases is implemented. No opposition to Abate application as found in studies by Nwobi *et al* (1996) were encountered in the village in this study.

Ponds in Akinyele Local Government Area were only treated in the dry season when ponds assume their role as transmission sites. Moreover, it is more convenient to fix a time for its application since this will make it easier for the uncompensated Local Government Area field workers. Some ponds in infected villages in the Local Government Area could not be treated with Abate due to the very little water in the ponds in the dry season and no water at all, the peak of the dry season as compared to the Northeast zone of Nigeria where some ponds could not be treated due to the excess volumes at the peak of the rainy season (Nwobi *et al.*, 1996) since Abate is only applied to water bodies with volumes not exceeding 500m<sup>3</sup>.

The colour change in pond water observed by some respondents could have been assumed or might be due to the relative inexperience of the Abate treatment team, manual application of the Abate or it could be due to one of the several factors affecting Abate application which Olajide *et al.*, (1987) stated. Olajide *et al* (1987) noted in the study they carried out that part of the Temephos applied to ponds got adsorbed by the sediments at the bottom of the ponds or became degraded into intermediate compounds. Sometimes, the addition of Temephos is rendered relatively ineffective because of leaves and aquatic vegetation which may prevent uniform application and spread. The temporary coloration of pond water in this present study might therefore be due to the fact that the chemical abate settled on leaves and aquatic vegetation and later the chemical got washed into the pond when the water level in the pond rose. This is because the first application was just before the rains. The villagers did not show any fear of poisoning even with the colour change of water.

The villagers accepted Abate application to their pond as a temporary measure until permanent steps can be taken. To the villagers, the permanent and most effective step is the provision of a well or a borehole for their village.

In this present study, the local people were not trained for the application of Abate as recommended by Edungbola *et al.*, (1994) though they actively participated in the process of its application by Local Government Officials. This affected the consistency in applying the Abate to the village pond because the Local Government Officials did not consistently apply the Abate as found in the work of Nwobi *et al* (1996), where fuel scarcity and lack of incentives for the field staff by the Local Government Authority disturbed the regularity of pond treatment. Sustainability of application was thus not enhanced.

ACKNOWLEDGEMENT: This study was supported by the UNICEF, South West Zone, Nigeria.

## References

- Edungbola, I.D.; Parakoyi, B.D.; Kayode, O.O. and Bello, A.B. (1994). A study to ascertain the acceptance of Abate (Temephos) for the treatment of community drinking ponds in the Nigerian guineaworm eradication programme. *The Trop. J. Hlth. Sci.* 1: 49 – 54.
- Falode, O.A. (1992). Perception and Management of guineaworm disease in Akinyele Local Government Area of Oyo State. A Dissertation submitted in partial fulfillment for the degree of Master of Science in the Department of Zoology, University of Ibadan.
- Hopkins, D.R. (1983). Dracunculiasis: an eradicable scourge. *Epidemiol. Rev.* 5: 208 – 219.
- Iyun, B.F. (1993). Community water and sanitation socio-economic analysis in Akinyele Local Government Area of Oyo State, Nigeria. UNICEF Water and Sanitation Project.
- Lyons, G.R.L. (1973). The control of guineaworm with Abate: a trial in a village of north-west Ghan. *Bull. WHO* 49: 215 – 216.
- Muller, R. (1970). Laboratory experiments on the control of Cyclops transmitting guineaworm. *Bull. Wld. Hlt. Org.* 42: 563 – 567.
- Nwobi, B.C. (1991). The status of guineaworm disease in Nigeria. An update. *Nig. J. Parasitol. Suppl.* 2: 31 – 62.
- Nwobi, B.C.; Ibe, A.U.C.; Oguoma, C.E.O. and Sallau, A.K. (1996). Field experiences on the use of 'ABATE' in the northeast zone of Nigeria. *The Nig. Parasit.*, vol. 17: 63 – 68.
- Olajide, I. Sridhar, M.K.C. and Kale, O.O. (1987). Guineaworm control in an endemic area in Western Nigeria. *Aqua* No. 6: 333 – 339.
- Sastry, S.C.; Jakumar, K.; Lakshaminarayana, V. and Seethapathi, Rao, V.N. (1978). Abate – its value as a cyclopscide. *J. Trop. Med. Hyg.* 81: 156 – 158.
- Sobande, A.A. (1992). Water supply baselinesurvey and infrastructural inventory of Akinyele Local Government Area of Oyo State, Nigeria. UNICEF Water and Sanitation Project.
- Udonsi, J.K. (1987). Control of endemic dracontiasis by provision of water supply in rural communities of Imo State, Nigeria. *Pub. Health.* 100: 63 – 70.