

Evaluation of Ivermectin Treatment in Onchocerciasis Patients in Kwande Local Government Area of Benue State, Nigeria

SUMMARY

An evaluation of patients treated with ivermectin was carried out in Kwande Local Government Area of Benue State. Of the 617 males and 539 females examined 45.7% and 54.5% were positive for Micro-filariae respectively. Out of the 7,466 patients treated with the ivermectin 2,000 of them were followed for the study, out of which 445 (6%) reported various side effects. Knowledge or awareness of the disease was 45%. 941 (47.05%) of them had earlier on reacted severely to Banocide or Suramin prior to treatment with ivermectin.

The reactions to ivermectin reported by Onchocerciasis patients in the study are generally low, mild in nature and are consistent with those obtained in similar studies elsewhere.

INTRODUCTION

Human Onchocerciasis (River blindness) is the result of infection by a thin parasitic nematode worm, *Onchocerca volvulus*. It is by far one of the most studied filarial disease in Nigeria (1,2,3,4,5, and 6). According to 1987 estimates by the World Health Organisation (WHO) approximately 85 million persons world-wide are at risk of infection. Of these, some 18 million are infected with the disease and over 1 million suffer from visual impairment. Onchocerciasis is prevalent in 26 African countries, 79 million individuals are at risk and some 16 million infected, with 20-25% of them living in Nigeria (7). The National Onchocerciasis Control Programme (NOCP) recommended Kwande Local Government Area (LGA) in Benue State Nigeria, for mass treatment with ivermectin based on an earlier nation-wide prevalence survey and reports of Gemade and Dipeolu (2) and Dipeolu and Gemade (3).

Ivermectin (Mectizan) is currently the drug of choice for mass treatment of Onchocerciasis; During the course of its evaluation for human usage, this drug was shown to be efficacious against microfilarial

stage, including reducing the ocular microfilarial load without provoking additional pathological effects (8). Ivermectin is distributed annually for mass chemotherapy in Benue State, a programme assisted by UNICEF. This paper reports community perception of treatment, side effects and gains in general well being following treatment of Onchocerciasis patients with ivermectin.

MATERIALS AND METHODS

Kwande L.G.A. lies between Latitude 6:30⁰ N and 7:10⁰ N Longitude 90 E to 9:40⁰ E. Water source for the area is river Amire (Utamen and Kiriki) which runs through the greater part of Kwande and Katsina-Ala L.G.As (Fig.1). The area is rich agriculturally and the inhabitants are greatly involved in rice, yam, cassava and soya beans cultivation. The rainy season lasts from April to October and the dry season from November to March. There are characteristic water falls and rapids over rocks which increases the potential of the river to support the breeding of *Simulium-damnorum* Theobald (1). This river and its tributaries flow all year round.

Drug administration and monitoring adopted for this study was similar to that of De Sole et al (9). Four communities Kuhe, Jato-Aka, Amahundu and Ikyogen were selected for this study. Seven thousand four hundred and sixty patients were treated. Two thousand of them were randomly selected and administered questionnaires to ascertain the local disease perception, epidemiology and side-effects of treatment with ivermectin.

Skin snip from the iliac crests were obtained from 381, 268, 244 and 263 patients from Kuhe, Jato-

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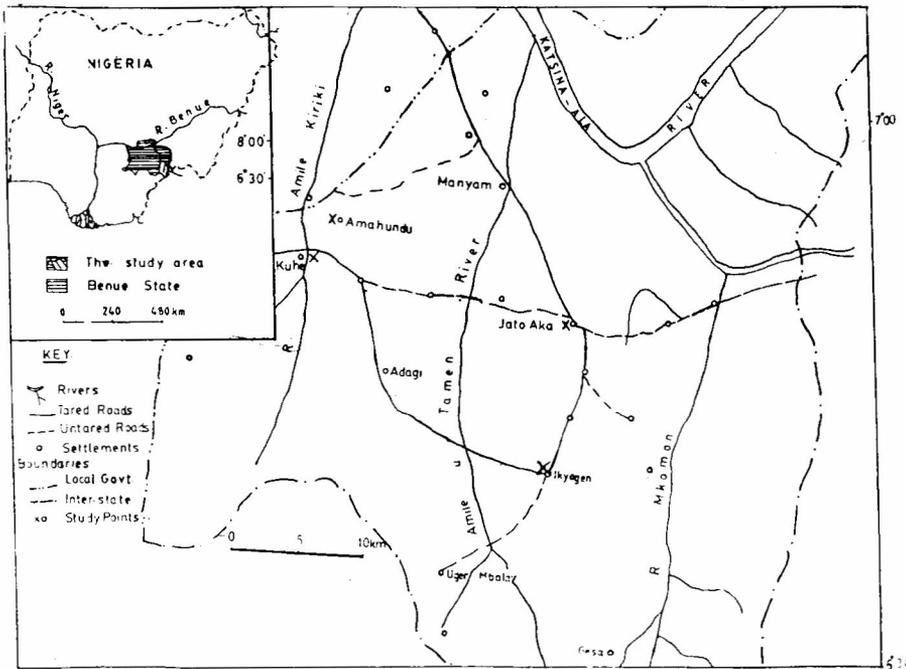


Fig 1. The Amite valley showing the Study Locations

RESULTS

The prevalence rate of Onchocerciasis from the analysis of micro-filarial positive skin snip was 83.6, 67.7, 32.8 and 25.7 per cent at Amahundu, Ikyogen, Kuhe and Jato-Aka respectively. Of the 617 males and 539 females examined 45.7% and 54.5% were positive with microfilariae of *Onchocerca volvulus* respectively (Fig. 2). There was no significant difference between sexes in levels of positive microfilarial counts in the four communities ($P > 0.05$).

905(45%) of the 2,000 respondents have knowledge of Onchocerciasis with regards to the causative agent. Only 150(7.5%)

Aka, Amahundu and Ikyogen respectively using Holth's corneoscleral punch. The microfilariae from skin snip were examined and counted under the microscope.

The administration of ivermectin was monitored by following the House to House and sentinel method of distribution at dosage specified by the manufacturers (Merck Sharp and Dohme Research Laboratories) and recommended by the WHO. The patients response to the drug was monitored through visiting their home seventy-two hours post therapy as well as visiting referral centres. The cost effectiveness of the methods used was evaluated by recording the cost of every process in the distribution of the drug.

knew that they had nodules as a result of Onchocerciasis. 1,023(51%) had taken either Banocide or Suramin within last five years and 941(92%) of them had various degrees of adverse reactions to either of these drugs (Table 1). 1,010 respondents had taken ivermectin before this study

Table 1: Reaction of patients treated with Banocide or Suramin prior to Ivermectin treatment against those treated with Ivermectin only.

	Total No Treated	No. with reaction %	No. without reaction (%)
No. Treated with Banocide or Suramin	1,023	94(91.98)	82(8.02)
No. Treated with Ivermectin	7,466	445(5.96)	7,021(94.04)

($P > 0.05$)

and 445(5.96%) had different complaints after treatment. 930(46%) noticed an increase in general well being following treatment and 190(9.5%) expelled different kinds of parasitic helminths after treatment.

Of the 100 adults excluded from treatment based on restrictions by the manufacturers and WHO. 50(50%) were indifferent, 35(35%) were upset and angry and 1,005(50.2%) of the entire respondents were willing to pay for ivermectin if necessary.

Side Effects/Severe Reactions

Five patients reported severe reactions, 3 of

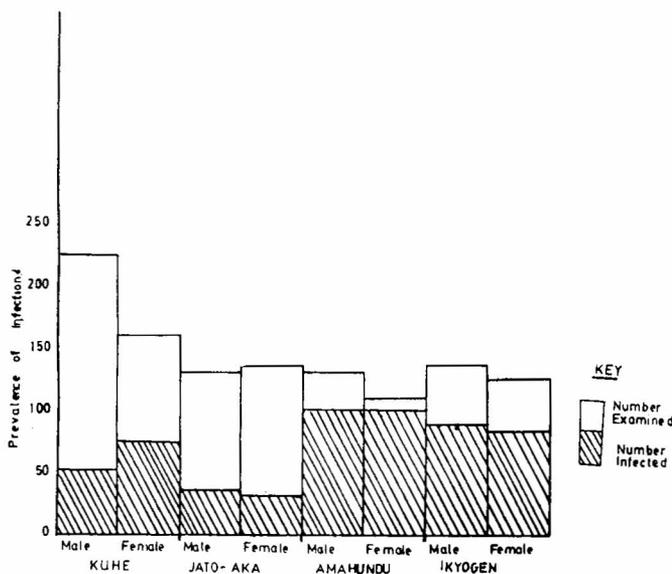


Fig.2. Showing Prevalence of Infection in Male and Female in Studied Communities.

these had severe dizziness only, while 2 had dizziness and general weakness of the body leading to inability to walk without support. Table 2 shows details of side effects encountered. There was no fatal case resulting from ivermectin treatment during this study. The house to house method was more expensive for taking the drug from the State capital to the patients in endemic communities.

Table 2: Side effects/Reactions among patients treated with Ivermectin

S/NO	SIDE EFFECTS	MALES (%)	FEMALES (%)	TOTAL NOS.(%)
1.	Swellings: Groin/Scrota region	10(2.2)	7(1.5)	17(3.82)
	Lower Limbs	19(4.3)	17(3.8)	36(8.09)
	Upper Limbs	23(5.2)	13(2.9)	36(8.09)
	Face and eyes	36(8.1)	15(3.4)	51(11.46)
2.	Pruritis (itching)	51(11.1)	45(10.1)	96(21.57)
3.	Body pain	56(12.6)	49(10.6)	105(23.60)
4.	Fever	15(3.4)	9(2.0)	24(5.39)
5.	Insomnia	9(2.0)	6(1.3)	15(3.37)
6.	Dizziness	2(0.07)	1(0.01)	4(0.9)
7.	Diarrhoea	3(0.1)	2(0.04)	3(0.67)
8.	Vomiting	1(0.02)	2(0.04)	3(0.67)
9.	Headache	23(5.2)	16(3.6)	39(8.76)
10.	Arthralgia	2(0.07)	4(0.08)	6(1.35)
		253(56.9)	192(43.1)	445(100)

DISCUSSION

The human infection rates of 83.6, 67.7, 32.8 and 25.7 per cent in Amahundu, Ikyogen, Kuhe and Jato-Aka respectively confirms the high endemicity of this area. Gemade and Dipeolu (2) and Dipeolu and Gemade (3) had obtained similar results. The approximately equal prevalence of infection in both sexes is due to the fact that activities which exposes the population to infection in these communities are carried out by both sexes. The Tivs living in Kwande L.G.A. are mostly farmers, fishermen and hunters. The Tiv women farm and fish as the men, but they do not hunt. Contact with vector is most likely during fishing and farming and thus women have equal chances of infection as the men. This observation agrees with earlier works by Dipeolu and Gemade (3), Gemade and Dipeolu (2), Onwuliri et al (14) and Akogun and Onwuliri (5).

In 1989 the NOCP recommended Kwande LGA for mass treatment for Onchocerciasis with Ivermectin and this accounted for the high number of respondents

who had earlier taken Banocide, Suramin or Ivermectin before. Previous studies like that of Gemade and Dipeolu (2). Dipeolu and Gemade (3) and Crosskey (1) must have led to the better understanding of the disease aetiology. Results showed that persons treated with Ivermectin reacted in similar manner as other patients from neighbouring West African and South American countries (9), in eight communities in West Africa (10), in Sierra Leone (11), in Cameroun (12) and in Guatemala (13).

The Deworming effect of Ivermectin on intestinal helminths during mass treatment was observed and this was similar to that reported by Abanobi and Anosike (14) in Imo State, Nigeria. As long as patients are assured of continued treatment with Ivermectin through direct administration annually as planned and being done now, there will be less risk of non compliance to the exclusion criteria and abuse by recipients due to its efficacy in expelling worms. In comparison with Banocide and Suramin, Ivermectin gave less and milder side effects which were easier to handle and monitor. WHO (7) stressed restrictions placed on the use of Suramin because of the frequency of associated complications and because the drug is intrinsically toxic and relatively difficult to handle

There are few drugs presently in use for treatment of tropical diseases that have undergone the scrutiny that ivermectin has had. No death attributed to ivermectin treatment has been reported. Medical supervision has been strongly advocated for any control programme involving the free distribution of ivermectin to heavily infected onchocerciasis patients (7,8). Alternative methods of reliably assessing the dose of ivermectin is highly desirable to help community self-treatment with ivermectin and for rapid monitoring of treatment to determine the appropriate use of Ivermectin against Onchocercal skin disease, particularly in areas where Onchocerciasis cause less blindness like rainforest areas of Nigeria.

Efforts to achieve simple, cheap and efficient methods of dispensing ivermectin have been reported by Nwoke (6) and Alexander et al (15). Since the drug does not seem to have long term effect on the adult Onchocerca volvulus, it will be necessary therefore to continue its annual administration for many years now that large scale ivermectin treatment have started in the country. There is need for international donor agencies to help subsidise the cost of taking the drugs to endemic villages and those at risk due to its relatively high local cost even though the drugs are given free of charge.

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REFERENCES

1. Crosskey, R.W. The distribution of *Simulium damnosum* Theobald in Northern Nigeria. *Trans. R. Soc. Med. Hyg.* 50, 379-392, 1956.
2. Gemade, E.I. and Dipeolu, O.O. Onchocerciasis in Benue State of the Nigeria. II Prevalence of disease among the Tivs living in the Kwande Local Government Area. *Ann. Trop. Med. Parasitol.* 77, 513-516, 1983.
3. Dipeolu, O.O. and Gemade E.I. Onchocerciasis in Benue State of Nigeria, IV. The prevalence of the disease among the population in Manor. *Int. J. Zoon.* 10, 85-95, 1983.
4. Akogun, O.B. and Onwuliri, C.O.E. Hyperendemic onchocerciasis, in the Taraba River Valley of Gongola State (Old Adamawa Province), Nigeria. *Ann. Parasitol. Hum. Comp.* 66 22-26, 1991.
5. Nwoke, B.E.B. Musculo-skeletal pain (MSP) in Onchocerciasis, a potential in the rapid low cost epidemiological survey and in the assessment of impact of Ivermectin treatment on a community. *Angew. Parasitol.* 33 133-138, 1992.
6. WHO Third report of Experts Committee on Onchocerciasis. 167, pp. 1987.
7. River Blindness Foundation Onchocerciasis or River Blindness: A technical review for health professionals and Scientists. Prepared by: The River Blindness Foundation External Affairs Office. 1993.
8. De Sole, G. Remme, J. Awadizi K. Accorsi S. Alley E.S. Ba O. Dadzie, K. Y. Giese, J. Karam, M. and Keita, F.M. Adverse reactions after large scale treatment of Onchocerciasis with Ivermectin: Combine results from eight community trial. *Bull. Wld. Health Organisation* 67 707-719, 1989.
9. Whitworth, J.A. et al A community trial of Ivermectin for Onchocerciasis in Sierra Leone: Clinical and Parasitological response to initial dose. *Trans. R. Soc. Trop. Med. Hyg.* 85. 92-96. 1991.
10. Moyou Somo, R. Ngosso, A. Dinga, J.S. Enyong, P.A. and Fobi, G.A community-based trial of Ivermectin for Onchocerciasis control in the forest of South Western Cameroun: Clinical and Parasitologic findings after three treatments. *Am. J. Trop. Med. Hyg.* 9-13, 1993.
11. Cupp, E.W. Ochoa, J.O Collins, R.C. Cupp, M.S. Gonzales-Peralta, C. Castro, J. and Zea-Flores, G. The effects of repetitive community-wide Ivermectin treatment on transmission of *Onchocerca volvulus* in Guatemala. *Am. J. Trop. Med. Hyg.* 47 170-180, 1992.
12. Onwuliri, C.O.E. Nwoke, B.E.B. Lawal, I.A. and Iwuala, M.O.E. Onchocerciasis in Plateau State of Nigeria. II. the prevalence among residents around the Assob River Area. *Ann. Trop. Med. Parasitol.* 81, 49-52, 1987.
13. Collins, R.C. Gonzales-Peralta, C. Castro, J. Zea-Flores, G. Cupp, M.S. Richard, F.O. and Cupp, E.W. Ivermectin: Reduction in prevalence and infection intensity of *Onchocerca volvulus* following biannual treatments in five Guatemalan communities. *Am. J. Trop. Hyg.* 47 156-169, 1992.
14. Abanobi, O.C. and Anosike, J.C. Observation on the deworming effect of Mectizan on intestinal helminths during mass treatment in Imo State, Nigeria. Paper 24; 18th Annual Conference of the Nigerian Society of Parasitology, Awka, Nigeria. Sept. 28-Oct 1, 1994,
15. Alexander, N.D.E. Cousens, S.N. Yahaya, H. Abiose, A. and Jones, B.R. Ivermectin dose assessment without weighing scales. *Bull. Wld. Helth. Org.* 71 361-366, 1993.