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## Evaluation of Mectizan Efficacy in the Treatment of Onchocerciasis using Microfilarial load in a community in South-Eastern Nigeria

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**ABSTRACT:** Studies on the evaluation of mectizan efficacy in the treatment of onchocerciasis using microfilarial load in Aninegeye community, South Eastern Nigeria was carried out. Before the commencement of mectizan administration, 50% prevalence of Onchocerciasis was reported for this community. After several years of administration of mectizan of 200 individuals examined in Aninegeye community, 3 (1.50%) prevalence was reported. There was no significant difference between the male and female individuals ( $P < 0.05$ ). This research confirmed mectizan to be a highly effective microfilaricide. Continuous administration of this drug with completely eliminate this infection in this community and in other communities in the South-Eastern Nigeria where prevalence is still reported.

**Keywords:** Evaluation, Mectizan Efficacy, Treatment, Onchocerciasis, Microfilarial load, South-Eastern Nigeria

### Introduction

Human Onchocerciasis is the second commonest parasitic infection to malaria in Nigeria and affects 60% of the population (Abiose, 1993). It affects over 18 million people living mainly in tropical and subtropical countries of the world. This disease produces bizarre and sometimes irreversible pathological changes of the eyes, the skin and the lymphatic system. The worst consequence of Onchocerciasis is partial or total blindness which may affect over one third of the adult population in highly endemic area (Oparaocha, 1999).

Nigeria had the largest number of infected persons in the whole of Africa; about 7 million people with 114,000 blinded by it (WHO, 1998, Nwoke & Uwazie, 1991). In the South-Eastern Nigeria where Aninegeye community of Cross River State is located, treatment of Onchocerciasis started in 1995 and the African programme for Onchocerciasis Control (APOC) support for the community directed treatment with ivermectin (CCDTI) project started in 1997.

Out of 62 communities sampled in Cross River State, Nigeria, 50 communities were endemic with nodules of Onchocerciasis. In Aninegeye community particularly, out of 50 persons examined, 50% prevalence of Onchocerciasis was reported (NOCP – CRS, 1994).

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For the treatment of Onchocerciasis, ivermectin has been shown to be very effective with an excellent safety profile (Goa *et al* 1991). Ivermectin has so far been distributed to African communities where river blindness (Onchocerciasis) is endemic through the National Onchocerciasis control programmes (NOCP) and APOC. Millions of community members in several villages need such treatment once or twice a year for many years (WHO 1996). Duke (1990) said that the potency of ivermectin lies in it acting as a microfilariae suppressant by impeding the outlet of the microfilariae from the uteri of the female worm. This action last for 6 – 12 months delaying the build up of microfilariae in the body of the patient. Hence this drug relieves the intense itching due to the disease, clear microfilariae from the eye. Thus halting the progression towards blindness except in very advanced cases.

The objective of this research is to evaluate ivermectin efficacy in the treatment of microfilariae emerging from the subcutaneous tissue during Onchocerciasis treatment.

## **Materials and Methods**

### *Study Area*

Cross River State is one of the 36 states of Nigeria located in the South Eastern Region of the country. Within Cross River State, there are 14 Local Government Areas each with several communities. Aninegeye community in Akamkpa Local Government Area of Cross River State was chosen for this study because of previous records of the prevalence of Onchocerciasis in this community. Moreso, the distribution of ivermectin commenced in this community since 1995.

### *Ethical consideration*

The survey was carried out after the necessary permission had been sought and obtained from the Local Government Council. Moreover, the cooperation and assistance of the village head, the village based health worker and the community directed distributor of ivermectin were also obtained.

### *Collection and examination of skin-snips for isolation of microfilariae*

Parasitological diagnosis for Onchocerciasis was based on the identification of microfilariae of *Onchocerca volvulus* in skin-snips. Sterilized corneoscleral punch was used to take 3-5mg skin snips from the right and left iliac crest from each patient. The snips was transferred immediately to a drop of normal saline on a microscope slide and examined under the microscope. Corneoscleral punch was sterilized with methylated spirit after use on each individual examined.

Structured questionnaires were administered to the individuals examined to confirm their age and sex.

## **Results**

The number of individuals who had previously been treated with Ivermectin in Aninegeye were screened for the presence of microfilariae using skin snip tests. Out of 200 individuals screened for microfilariae load, the percentage prevalence was 3(1.50%) (Table 1). The prevalence for both male and female individuals were 2(2.15%) and 1(0.93%) respectively. T-test analysis showed that there was no significant difference between the males and females ( $P < 0.05$ ). The highest microfilariae load was recorded in individuals between the age of 60 and above with 2(3.70%).

## **Discussion**

Studies on the evaluation of ivermectin efficacy in the treatment of Onchocerciasis using microfilarial load in Aninegeye community in South Eastern Nigeria was carried out between June and August, 2006. Out of the 200 individuals examined, the overall prevalence reported was 3(1.50%). In an earlier investigation carried out by NOCP – CRS (1994), the prevalence of 19(11.88%) was reported out of 160 individuals whose skin snips were examined for the presence of *O. volvulus* microfilariae in

this community. The high prevalence in the NOCP-CRS (1994) studies was due to the fact that the Community Directed Distributor (CDD) had not started the distribution of ivermectin in this community.

Table 1: Age range and % microfilariae load in individuals treated with Mectizan in Aninegeye community, Cross River State, South-Eastern Nigeria

Age range	No of individuals examined		No (%) of individuals infected		Overall no (%) prevalence for both sexes
	Male	Female	Male	Female	
6 – 19	5	4	0(0.00)	0(0.00)	0(0.00)
20 – 29	10	16	0(0.00)	0(0.00)	0(0.00)
30 – 39	23	34	0(0.00)	0(0.00)	0(0.00)
40 – 49	23	23	0(0.00)	0(0.00)	0(0.00)
50 – 59	17	12	0(0.00)	1(8.33)	1(3.45)
60 above	15	8	2(13.33)	0(0.00)	2(8.70)
Total	93	107	2(2.15)	1(0.93)	3(1.50)

It is evident that there was a marked reduction in the prevalence of Onchocerciasis using microfilarial load in the community under investigation as 3(1.50%) prevalence was recorded out of 200 individuals examined as stated earlier. In a related study, Richard *et al* (1989) reported the decrease in the concentration of microfilariae by 13%, 72 hours after treatment with a single dose of Ivermectin. Albiez and Duke (1988) also reported a decrease of microfilariae emergence from skin snips when treated with ivermectin.

The reduction in the prevalence of microfilarial load in the skin is further supported by the work of Goa *et al* (1991). In their studies, they found that a single annual dose of mectizan of 150 to 200mg/kg was able to effectively reduce microfilariae density in the skin to near zero after one month and to successfully maintain a low microfilariae level for up to 12 months.

The overall prevalence for both male and female individuals were 1(3.45%) and 2(8.70%) respectively. Statistical analysis showed that there was no significant difference between the two sexes. The infection was however restricted to individuals from 50 years and above. This may be due to the fact that older people might have had this disease before the commencement of the mectizan distribution exercise since mectizan does not affect adult *Onchocerca volvulus*.

This study has confirmed mectizan to be highly effective microfilaricide. Moreover, this reduction in the number of microfilariae suggest that mectizan has successfully interrupted the life cycle of *Onchocera volvulus* in man.

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