

PROTEINURIA AND OCCURRENCE OF ONCHOCERCA VOLVULUS MICROFILARIAE IN SKIN, URINE AND BLOOD OF ONCHOCERCIASIS PATIENTS AFTER IVERMECTIN TREATMENT IN ADIKPO, BENUE STATE, NIGERIA

K.B. Tanyigna¹; J.A. Onah²; E.U Amuta³; C.O.E. Onwuliri³; and I.A.O. Ujah⁴

^{1,3,4}Departments of Microbiology, Zoology and Obstetrics & Gyneacology, University of Jos, P.M.B. 2084 Jos, Nigeria.

²Department of Parasitology, Faculty of Vetenary Medicine, University of Agriculture, Makurdi.

Correspondence to: Dr. K.B. Tanyigna

ABSTRACT

Fifty adult patients in Adikpo, Benue State, Nigeria having an average of 50 microfilaria/skin snip (mf/ss) and 2 microfilaria/milliliter (mf/ml) in skin and urine respectively were given a single treatment of Ivermectin at a dose rate between 150 – 200mg/kg. Five of the patients also had microfilariae in their blood. Seven days after this treatment, there was a decrease of the microfilaria from pretreatment level to 17.8% and 10% in the skin and urine respectively (i.e.82% and 90% clearance). There was 100% clearance in the blood. Trace proteinuria shown in 30 (60%) patients before treatment was increased to 45 (90%) patients after treatment. This study has revealed that Ivermectin has a great efficacy in clearing microfilaria of *Onchocerca volvulus* in the skin, urine and blood of individuals. The increase in the number of patients with mild proteinuria after treatment and its implication require further investigation. It may not mean that the increase in protein content after treatment is due to Ivermectin.

INTRODUCTION

Onchocerciasis or River blindness disease is caused by the infection of filarial nematode worm *Onchocerca volvulus*. The disease affects over 80 million people culminating in causing blindness with a “lion look” and visual impairment in 1 – 2 million people in rural communities of Africa (1, 2). Other clinical manifestations include palpable onchocercal nodules (predominantly in the pelvic region, “Leopard skin”, elephantiasis of the genitalia, hanging groin and hernias (2).

The disease has been reported in all parts of Nigeria (3) including Benue and Plateau States of Nigeria (4, 5, 6). Onchocerciasis has remained both a significant public health and socio-economic problem interfering with Government plans and programmes. This has especially made “Health for all by the year 2000” a dream rather than a reality (7). The importance of this disease has made it imperative to assess the efficacy of the “new drug”

– Ivermectin (Mectizan) in an onchocerciasis endemic area of Adikpo in Benue State – Nigeria. Other drugs in the use before Ivermectin emergence have shown many adverse side effects beside the long periods of administration. Ivermectin, a microfilaricidal drug, on the other hand can be effective with a single treatment, it is safe and it has a synergistic effect on the other intestinal helminthes (8). Efficacy of Ivermectin may have been assessed but not in Adikpo as literature survey has revealed.

MATERIALS AND METHODS

Ivermectin (Mectizan) were administered at a dose of between 150 – 200mg/mg to 50 patients that previously tested positive for *Onchocerca volvulus* infection by skin snip method. 20 other individuals that tested negative for *Onchocerca volvulus* infection were also treated with the drug at the same dose rate. After seven days of the oral

administration of the drug, parasitological examination were carried out on the skin snip, blood (both thin and thick smear preparation of the peripheral blood) and urine as described by Anderson *et al*, (9). The bloodless skin snip was taken from the Iliac Crest region of the body using a 2mm bite Holth type Corneo-scleral punch. The protein in the urine was detected using the Albustix (AMES multiple reagent strips, Great Britain). The strips were dropped into freshly voided urine which was read immediately as described by Greene *et al*, (10).

RESULTS

The mean microfilaria in the skin snips and urine of the 50 patients were 50mf/ss and 2mf/ml respectively. The mean microfilaria after treatment with Ivermectin was 8.9mg/ss (17.8%) and 0.2mf/ml (10%) in the skin and urine respectively. This represents an average clearance of 82.2% and 90% from skin and urine respectively (Table 1). Trace proteinuria in onchocerciasis patients (n=50) showed that 30 (60%) of them were positive while 20 (40%) were negative. Those persons with no microfilariae in the skin serving as control were 20 (100%). After treatment, the proteinurial level increased to 45 (90%) in those positive with microfilariae. The control group however remained negative even after the administration of the drug with placebo (Table 2).

Table 1: Microfilariae level in skin and urine of onchocerciasis patients (n=50)

	Skin (mf/ss)	% +ve	Urine (mf/ml)	% +ve
Average No. before treatment	50	100	2.0	100
Average No. after treatment	8.9	17.8	0.2	10
Average clearance	41.1	82.2	1.8	90

Table 2: Trace proteinuria in onchocerciasis patients

	Onchocerciasis patients (n=50)	No. Onchocerciasis (i.e control) (n=20)
Before treatment	+ve (%) -ve (%) 30 (60) 20 (40)	-ve (%) 20 (100)
After treatment	45 (90) 5 (10)	20 (100) 20 (100)

DISCUSSION

A rapid decrease of the skin microfilariae compare to the pretreatment level as noted in the present study has also been observed by other workers (11, 12). The reverse has however been the case with increase microfilariae in blood and urine after Diethyl Carbamazine (DEC) treatment (13).

As in the present work, proteinuria although transient has been recorded in a proportion of Onchocerciasis patients and also among individuals receiving anti-filaria treatment (10, 14, 15). The number of patients with mild proteinuria agrees with the finding of Anderson *et al*, (9), who also reported that most Onchocerciasis patients had mild proteinuria (i.e. 30mg protein/100ml for those who do intense physical exercise). The reason for mild proteinuria cannot easily be linked up with their occupation (farming), which is a sort of intense exercise since their counterparts in the control group showed negative proteinuria. These observations may suggest some associations between Onchocerciasis disease and proteinuria. The increase in the number of cases with mild proteinuria after treatment may also not be linked up with Ivermectin, for the same reason that treatment with the drug in the control group remained unchanged. This may need further researches for better elucidation.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. Bassey and his Laboratory team at St. Monica's Catholic Hospital Adikpo for their cooperation.

REFERENCES

1. WHO (1987). WHO Expert Committee on Onchocerciasis. Third Report Tech. Ser. 752: 53 – 54.
2. Abiose, A. (1990). Onchocerciasis and Blindness. Paper at the 2nd Conference on Onchocerciasis Research and Control between 12th – 15th August, Kaduna.
3. NOCP (1990). Report of Nigeria Prevalence Survey. The Federal Ministry of Health , Lagos. Nigeria Sponsored Prevalence Survey.
4. Gemade, E.I.I and Dipeolu, O.O. (1982). Onchocerciasis in the Benue State of Nigeria. The Incidence Sites and Infection rates of *S. domnosom* in Kwande Local Government Area. Inst. Sc. App. 45: 11 – 15.
5. Gemade, E.I.I and Dipeolu, O.O. (1983). Onchocerciasis in the Benue State of Nigeria IV. The prevalence of disease among the Tivs in Kwande Local Government Area. Ann. Trop. Med. Hyg. 60: 31 -35.
6. Onwuliri, C.O.E. and Eno, R.D.A. (1985). Onchocerciasis in Plateau State of Nigeria I. Prevalence and Distribution in Bassa and Barkin Ladi Local Government Areas. Trop. Med. Parasitol. 40: 102 – 105.
7. Edungbola, I.D. (1991). Onchocerciasis Control in Nigeria. Parasitol. Today. 7: 5.
8. Remnue, J.; Baker, R.N.A.; De Sole, G. and Dadziely-Walsh, J.F. (1989). A Community Trial of Ivermectin in the Onchocerciasis focus of Asuebende, Ghana I. Effect on the Microfilariae Reservoir and Transmission of *Onchocerca volvulus*. Trop. Med. Parasitol. 39: 432 – 440.
9. Aderson, R.I.; Rrazen, L.E. and Buck, A.A. (1975). Onchocerciasis in Guetamia II. Microfilariae in Urine, Blood and Sputum after Diethyl Carbamazine. Am. J. Trop. Med. Hyg. 24: 58 – 61.
10. Greene, E.I.; Taylor, H.R.; Humphery, R.L. and Lawley, T.J. (1980). Circulating Immune Complexes in Onchocerciasis. Significance and Influence of Diethyl Carbamazine Therapy. Clin. Res. 28: 370.
11. White, A.T.; Newland, H.S.; Taylor, H.R. *et al* (1987). Control Trial and Dose finding Study of Ivermectin for treatment of Onchocerciasis. J. Infect. Dis. 156: 403 – 470.
12. Richards, F.O.; Zeaflores, G. and Duke, B.O.L. (1989). Dyanamics of Microfilariae of *Onchocerca volvulus* over the first Seventy Two Hours after Treatment with Ivetrnectin. Trop. Med. Parasitol. 40: 299 – 303.
13. Basset, D.; Bouree, P. Basset, A. and Lariverie, M. (1989). Effect of Diethyl Carbamazine and Ivermectin on the Mobilazation of Microfilariae of *Onchocerca volvulus*. Patho. Bio. (Paris 375 pt. 2): 668 -672.
14. Rippert, C.; Riedel, D.; Yang, R.; Onana, A. and Zinflow, A. (1977). Etude Epidemiogigne de la Onchocercases dancing Villages de la vallee de la Sanag (Cameroon). Bull. Soc. Pathol. Exot. 70: 178.
15. Ngu, J.L.; Adam, R.; Leke, V. and Fitanji, A. (1980). Proteinuria associated with Diethyl Carbamazine. Lancet: 710.