

## REASSESSMENT OF ONCHOCERCIASIS PREVALENCE IN ETTEH, NIGERIA, AFTER A DECADE OF MASS MECTIZAN CHEMOTHERAPEUTIC INTERVENTION: PRELIMINARY REPORT

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### ABSTRACT

*A reassessment of the prevalence of onchocerciasis was carried out in Etteh community in Igbo-Eze North Local Government Area of Enugu state, Nigeria. The community has been known to be highly endemic for onchocerciasis. The assessment of endemicity was based on Rapid Assessment Method (RAM), which involved the use of two onchocercal indices namely the presence of palpable nodules and depigmentation (Leopard skin). Out of the 716 individuals examined consisting of 327 males and 389 females, the overall prevalence of palpable onchocercal nodules was 51.4%. The females had insignificantly ( $P>0.05$ ) higher rate of onchocercomata (51.9%) than males (44.0%). The anatomical distribution of nodules in descending order of occurrence was pelvic region (26.3%), head and neck region (20.6%), thorax and lumbar (15.7%), upper limbs (14.5%), lower limbs (12.4%) and others (abdomen and shoulders, 5.9%). It is obvious that in spite of the decade-long, annual free distribution of Mectizan in the area, onchocerciasis prevalence is still high.*

**Keywords:** Onchocerciasis, Mectizan, Reassessment, Nodules, Chemotherapy

### INTRODUCTION

Human onchocerciasis is a filarial multisystem disease caused by infection with the nematode – *Onchocerca volvulus*. Onchocerciasis is the cause of clinical and epidemiological dermatologic, ophthalmologic, lymphatic and systemic manifestations with blindness and impaired vision as the most dangerous disabilities associated with the disease. The disease has also been implicated in cases of musculo-skeletal pain, epilepsy, inguinal hernias, secondary amenorrhea, spontaneous abortion, lactation difficulties, infertility and sterility, although some of these have not been proved (Okuliez *et al*, 2007). Onchocerciasis is a disease of considerable socio-economic and public health importance with a lot of implications.

The disease is endemic in 37 countries in Africa, Latin America and Yemen, where an estimated 123 million people are at risk of contracting the disease and 17 – 18 million are already infected. Approximately 95% of all infected people live in Africa (WHO, 1995; Okuliez *et al*, 2004), especially in the sub-Saharan region. The disease, therefore, constitutes a major public health problem and an obstacle to socio-economic development in the sub-region (Nwoke, 1990). Edungbola (1991) reported that out of over 80 million Nigerian population, as at that time, an estimated 40 million were at the risk of infection with about 7 million suffering from onchocerciasis; so of all the countries of the world, Nigeria has the greatest number of persons with onchocerciasis.

Etteh community has been identified as an onchocerciasis endemic area (Amazigo and Obikeze, 1991). Mass distribution of Mectizan in Etteh started in 1996 alongside other endemic communities of Enugu State, Nigeria as part of the African Programme for Onchocerciasis Control (APOC), launched by the World Bank in 1995 with the goal of eliminating onchocerciasis, as a public health problem.

It therefore became necessary to reassess the prevalence of onchocerciasis in Etteh community in order to establish the effectiveness or otherwise of Mectizan distribution in this area and to suggest reasons for continued endemicity, if the prevalence is still high. The survey would also lay down complete parasitological data on the disease in the community because the pre-treatment survey by Amazigo and Obikeze (1991) examined adolescent girls only.

### MATERIALS AND METHODS

**Study Area:** The study area is Etteh located in the Northern part of Igbo-Eze North LGA of Enugu State and about 100 kilometers north of Enugu, the capital city of Enugu State.

Etteh shares land borders with Olomaboro LGA of Kogi State to the east and Igala mela/ Adoru LGA of Kogi State to the west. The people therefore have a lot of cultural affinity with the Igala and Idoma speaking people of Kogi State, although geographically located in Enugu State. The languages spoken are Igbo, Igala and Idoma.

**Table 1: Age and sex-related prevalence of onchocerciasis nodules and leopard skin depigmentation among Etteh population, Enugu State**

Age Group (Yrs)	No. Examined			No. Positive for Nodules			No. Positive for Leopard Skin		
	M	F	Total	M	F	Total	M	F	Total
≤ 10	46	48	92	12 (27.3%)	14 (29.2%)	26 (28.3%)	1 (2.3%)	2 (4.2%)	3 (3.3%)
11-20	76	87	163	22 (28.9%)	26 (29.9%)	48 (29.4%)	3 (3.9%)	7 (8.0%)	10 (6.1%)
21-30	73	67	140	34 (46.6%)	26 (38.8%)	60 (42.9%)	13 (17.8%)	14 (20.9%)	27 (19.3%)
31-40	45	69	114	30 (66.7%)	45 (65.2%)	75 (65.8%)	13 (28.9%)	23 (33.3%)	36 (31.6%)
41-50	48	68	116	36 (75.0%)	50 (73.5%)	86 (74.1%)	17 (35.4%)	25 (36.8%)	42 (36.2%)
≥ 51	41	50	91	32 (78.0%)	41 (82.0%)	73 (80.2%)	20 (48.8%)	30 (60.0%)	50 (54.9%)
TOTAL	327	389	716	144 (44.0%)	202 (51.9%)	386 (51.4%)	67 (20.5%)	101 (26.0%)	168 (23.5%)

**Table 2: Nodule rate, nodule load and anatomical location of onchocercal nodules among residents of Etteh, Nigeria**

Age Group (Years)	Nodule rate	Nodule load	Distribution (%)					
			Head and Neck	Upper Limb	Lower Limb	Thorax and Lumbar	Pelvic Region	Others
≤ 10	37(40.2)	46	16 (34.8)	8 (17.4)	4 (8.7)	5 (10.9)	8 (17.4)	5 (10.9)
11-20	48(29.4)	67	20 (29.9)	11 (16.7)	7 (10.4)	9 (13.4)	13 (19.4)	7 (10.4)
21-30	60(42.9)	73	17 (23.3)	10 (13.7)	8 (11.0)	12 (16.4)	20 (27.4)	6 (8.2)
31-40	84(73.7)	95	19 (20.0)	14 (14.7)	13 (13.7)	16 (16.8)	26 (27.4)	7 (7.4)
41-50	73(62.9)	100	17 (16.8)	16 (15.8)	15 (14.9)	18 (17.8)	30 (29.7)	4 (4.0)
≥51	66(72.5)	110	12 (13.3)	12 (13.3)	14 (15.6)	17 (18.9)	32 (35.6)	13 (11.8)
TOTAL	368(51.4)	491	101 (20.6)	71 (14.5)	61 (12.4)	77 (15.7)	129 (26.3)	42 (5.9)

Etteh lies in the forest-savanna mosaic and guinea savanna transitional zones. Most of the people's farmlands are located on the extensive stream network of the Anambra River system which itself is a major tributary of the lower Niger River situated between latitude 6° 00' N and 7° 35' N and longitude 6° 43' and 7° 42' W (Amazigo and Obikeze, 1991). The main occupation of Etteh people is farming and petty trading.

**Subjects and Methods:** A total of 716 subjects from 10 out of the 14 community clusters that constitute Etteh were chosen for the survey by purposive sampling (Ngomou and Walsh, 1993). All the community members who were eligible for Mectizan chemotherapy were eligible. These included individuals 5 years and above or height above 90cm or able to touch the opposite ear (Okoye *et al.*, 2006).

The enlisted subjects were examined by the Rapid Assessment Method (RAM) as detailed by Ngomou and Walsh (1993). The height and weight of each subject was taken to determine the appropriate dosage of Mectizan to be administered. A standard survey questionnaire was used to obtain further information towards achieving the research objectives.

## RESULTS

Out of the 716 individuals examined consisting of 327 males and 389 females, the overall prevalence of palpable onchocercal nodules was 51.4 %.

The females had insignificantly ( $P > 0.05$ ) higher rate of onchocercomata (51.9 %) than males (44.0 %) (Table 1).

The anatomical distribution of nodules in descending order of occurrence was pelvic region (26.3 %), head and neck region (20.6 %), thorax and lumbar (15.7 %), upper limbs (14.5 %), lower limbs (12.4%) and others (abdomen and shoulders, 5.9 %). The location of palpable nodules on the head and neck regions was highest amongst the ≤10 years age group (34.8 %), the frequency decreasing with age. The location on the upper limbs showed a similar pattern. On the contrary, location of nodules on the lower limbs, thorax/lumbar and pelvic regions increased with age (Table 2).

Leopard skin prevalence was 23.5 %. Females had a higher infection rate of 26.0 % than the males (20.5 %). The difference in infection rates between the sexes was not significant ( $P > 0.05$ ). Age-related prevalence of leopard skin showed that the prevalence of infection increased with age for both sexes.

## DISCUSSION

The results of the reassessment of the prevalence of onchocerciasis in Etteh show that the community is still highly endemic for the disease after 10 years of mass distribution of Mectizan in the Local Government Area in particular and Enugu State in general. In 1990 – 1991, Amazigo and Obikeze (1991) conducted a survey in the community among the adolescent girls. The results of the survey showed that 87(36.6 %) out of the 238 adolescent girls

examined had onchocerciasis (shown by skin snip examination) while 110 (46.2 %) of the girls had onchodermatitis. This established Etteh as an endemic community since usually males and adults are expected to have higher prevalence than the adolescent girls. About 16 years after the Amazigo and Obikeze (1991) survey and 11 years after the onset of mass Mectizan distribution, it was found that Etteh community still has a high prevalence of onchocerciasis. The indices used for measuring endemicity are those recommended in the Rapid Assessment Method (RAM) (Edungbola *et al.*, 1993). These are the presence of palpable nodules and leopard skin (LS).

The prevalence rate of palpable nodules was 51.4 %, 51.9 % in females and 44.0 % in males. It is common for males to have higher rates of onchocerciasis indices but in this study, it was found that the females had an insignificantly higher nodule rate ( $P > 0.05$ ) than males. This may be due to relatively similar exposures of males and females. Table 1 actually shows that from age  $\leq 10$  to age  $\geq 51$ , there were no significant differences between the nodule rates in males and females. Sex related differences are usually attributed to occupational differences between males and females right from childhood. It is, therefore, possible that in this community, occupational differences are not pronounced.

Age related prevalence of nodules in Etteh appears to be more pronounced, as there is a consistent increase from age  $\geq 10$  to age  $\geq 51$  as shown in Table 1. This is in line with some other works. Okuliez *et al.* (2007) reported that the prevalence of onchocerciasis is lowest in individuals aged 0-10 years. Afterwards, the prevalence sharply increases, with a peak in individuals aged 20-30 years.

On the anatomical distribution of nodules, the pelvic region was found to harbour the largest number of nodules (26.3 %), followed by head and neck region (20.6 %), thorax and lumbar region (15.7 %), upper limbs (14.5%), lower limbs (12.4 %) and others (abdomen and shoulders, 5.9 %). This agrees with previous results in West African region that the highest numbers of nodules are found in the pelvic region (Choyce, 1972).

The location of palpable nodules on the head and neck region was highest in the 0-10 years age group (34.8 %) with the frequency decreasing with age. This trend had previously been reported by previous researchers (Amazigo *et al.*, 1993; Ubachukwu, 2004) and the reason for this observed trend is not yet clear. Ubachukwu (2004) suggested that it could be either as a result of more than one vector complex or the height of the children in relation to the height at which *Simulium damnosum* bites. It is possible that children are bitten more in the head and neck regions.

The prevalence of leopard skin (L/S) was 23.5 % with females again having an insignificantly higher infection rate of 26.0 % than the males (25.0 %). The prevalence of this manifestation increased with age. This is as a result of the cumulative nature

of human onchocerciasis. Leopard skin is a characteristic finding in older patients (Okuliez *et al.*, 2007; Nwoke *et al.*, 1989), but surprisingly, it was found to exist in lower age groups, although the rate was quite low. This is an evidence that infection starts quite early in this community.

**Conclusion:** From the results of the reassessment of the prevalence of onchocerciasis in Etteh community, it is obvious that in spite of the free distribution of Mectizan in the area, onchocerciasis prevalence is still high. This is most likely attributable to inefficiency and inconsistency in the distribution of Mectizan, such that there is no obvious impact of the drug on the community disease prevalence. If only few people take the drug, the likelihood is that they will be reinfected from those that did not take the drug. There is need to investigate the details of Mectizan distribution to discover why disease prevalence is still as high as was recorded in this study, including among the age group 0 – 10 years, who should have had reduced infection rates, if the community had been properly treated with Mectizan for the past 10 years.

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