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CLINO-PATHOLOGICAL STUDY OF HUMAN ONCHOCERCIASIS IN IMO RIVER BASIN, NIGERIA, AND ITS IMPLICATION TO THE CONTROL OF THE DISEASE IN THE AREA.

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ABSTRACT

In a two year study of human onchocerciais in Imo River Basin, 1716 (75.3%) of 2278 individuals examined for various clinical signs of onchocerciasis haboured one or more onchocercal lesions. The commonest lesion encountered was nodules (20.7) followed by leopard skin (19.3%), while hydrocele/elephantiasis were the least (2.4%).

Prevalence of clinical signs varied with sex and age groups, with males and adults recording significantly ($P<0.05$) higher manifestations than females and adolescence.

Onchocerciasis endemicity as measured by the prevalence of palpable nodules was high (20.7%). The prevalence of microfilaries was fairly high (49.4%) while the intensity was generally low. Microfilarial rate tallied significantly ($P<0.05$) and positively with the prevalence of nodules, leopard skin, pruritus, blindness and musculo-skeletal pain in the communities surveyed. The epidemiological significance of this study in terms of a more comprehensive health education of the masses and a highly supervised ivermectin distribution for the control of the disease is highlighted.

Key Words: Onchocerciasis, clinical signs, microfilariae, ivermectin, control.

INTRODUCTION

Human onchocerciasis, the most debilitating and dreadful human filariasis is caused by the helminthic parasite *Onchocerca volvulus.* The disease, a major public health problem in most tropical and subtropical countries of the world affects mainly the eyes, the skin and the lymphatic system. It produces bizzare manifestation ranging from generalized itching, through various skin and lymphatic deformities and atrophies to partial or total blindness (Edungbola and Parakoyi, 1991).

Lymphadenopathies caused by *O. volvulus* have been found to include hernias and scrotal elephantiasis (Cherry, 1959; Connor *et al.,* 1970; Nelson, 1970; Edungbola *et al*; 1987), which are serious complications of long standing onchocerciasis.

Some researchers have carried out some work on the prevalence of onchocercal clinical signs, and the relationship between these lesions and onchocerciasis endemicity (Shell, 1981; Pearson, 1988; Edungbola *et al,* 1994; Kale 1994,; WHO, 1995). This survey was undertaking because no detailed epidemiological survey on the clinical manifestations of human onchocerciasis has been carried out in the Imo River Basin. It is therefore aimed at finding out the prevalence and the distribution of onchocercal lesions as well as the endemicity of the disease in Ihitte-Uboma and

Umuahia North Local Government Areas of the Imo River Basin. This would lead to the suggestion of some factors if any, needed to be incorporated into the on-going mectizan distribution for effective control of onchocerciasis in the area.

MATERIALS AND METHODS

They study area: The study was conducted in the Imo River Basin, lying approximately between latitudes 50° 30 ^{1} - 50 ° 47 ^{1}N and longitudes 7 ° 15 ^{1}- 7 ° 35 ^{1}E. Two thickly populated Local Government Areas; Ihitte-Uboma in Imo State, and Umuahia North of Abia State, were surveyed. The estimated area coverage is 175 sq. km. The Imo River forms common state and Local Government boundaries for these two areas. The Imo River together with it's tributaries like Acha and Eme rivers supply enough water for the farming activities of the inhabitants who are mainly farmers. Local crops cultivated include yam, maize, fluted pumpkin, cassava, okro and rice. The vegetation is tropical rain forest and the temperature ranges from.

Physical/Clinical Examination: Personal data such as name, age, sex, occupation and estimated distance of residence from infection foci were recorded for each subject. Visual acuity was measured using the procedure described by Rodger (1973) and adopted by Nwoke *et al.* (1989). Cases of ocular lesions and redness of the eye were recorded. Blindness was recorded as the inability of any subject to quickly count fingers at 3M distance or less following the WHO (1966) recommendation and adopted by Anosike & Onwuliri (1994). Subjects

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were further examined for obvious signs of onchocerciasis such as pruritus, leopard skin, visible and palpable nodules. The inguino-femoral regions of both sexes and the external genitalia of males were examined in detail (when permitted by the individual) for the presence of hanging groin, scrotal elephantiasis and hernias.

Parasitological Examination: Two bloodless skin-snips were collected from the left and right illiac crest of each individual with a Cornea-Scleral punch, after the area has been scrubbed with methylated spirit. The skin biopsies were incubated in physiological saline in wells of microtitre plates. They were examined later and the microfilariae counted and recorded.

RESULTS

Prevalence of Clinical Signs by Communities:
Table 1 shows the prevalence of clinical signs by communities. The highest number of cases were recorded at Ezimba (17.1%), followed by Abueke (14.5%) and Uzinomi (13.9%). Umuhu had the least number of cases (3.2%). Nodules (20.7%) were the most frequent clinical sign encountered, followed by leopard skin (19.3%) and muscular-skeletal pains (17.7%), while hydrocele were the least 22 (1.2%).

Distribution of Onchocercal Clinical Signs by Sex:
Male subjects had (86.1%) of the total onchocercal lesions recorded while the females had (69.0%) (Table 2). Male subjects had significantly higher ($X^2 = 77.5$; $P<0.0001$) prevalence of clinical signs than their female counter parts.

Distribution of Onchocercal Clinical Signs by Age in Imo River Basin:
The age specific distribution of onchocercal lesions presented in table 3 shows that clinical signs increased with advancing host age. However leopard skin, lymphatic lesions and oncho-blindness were scarcely recorded in younger age groups of 10-19 and 20-29 years (Table 3).

Prevalence and Intensity of Microfilariae:
The prevalence of microfilaria presented in table 4 was high in the communities sampled (49.4%). It correlated positively and significantly with nodule and leopard skin rates (Figs. 1 & 2), as well as rates of blindness, pruritus and muscule-skeletal pairs. The

Table 1: Distribution of Clinical Manifestations in Different Communities in the Area

Community	No (%)* clinical cases	Leopard skin	Other onchoder matitis	Hernias	MSP	Nodules	Eye lesions	Hydrocele/Elephantiasis	Female genital swelling	Blindness
Okata	164 (9.6)	40 (24.3)	24(14.6)	0(0.0)	16(9.7)	48(29.2)	8(4.8)	0(0.0)	12(7.3)	16(9.7)
Uzinomi	240(13.9)	24(10.0)	40(16.6)	12(5.0)	72(30.0)	24(10.0)	4(1.6)	4(1.6)	0(0.0)	60(9.7)
Onicha	122(7.1)	26(21.3)	18(6.5)	8(6.5)	18(14.7)	40(32.7)	4(3.2)	0(0.0)	0(0.0)	8(6.5)
Awuchimmo	208(12.1)	40(19.2)	22(10.6)	16(7.7)	34(16.3)	40(19.2)	4(1.9)	4(1.9)	4(1.9)	44(21.1)
Abueke	205(14.5)	40(16.0)	76(30.4)	8(3.2)	40(16.0)	40(16.0)	14(5.6)	0(0.0)	0(0.0)	32(12.8)
Umuoma	84(4.8)	6(7.1)	16(19.0)	4(4.7)	28(33.3)	16(19.0)	0(0.0)	0(0.0)	4(4.7)	10(11.9)
Ezimba	294(17.1)	60(20.4)	58(19.7)	24(8.1)	36(12.2)	80(27.2)	4(1.3)	8(2.7)	16(5.4)	8(2.7)
Nkwoegwu	106(6.1)	20(18.8)	16(15.0)	8(7.5)	20(18.8)	22(20.7)	4(3.7)	4(3.7)	4(3.7)	8(7.5)
Umuhu	56(3.2)	16(28.5)	8(14.2)	0(0.0)	10(17.8)	14(25.0)	0(0.0)	0(0.0)	0(0.0)	8(14.2)
Ofeme	192(11.3)	60(31.2)	20(10.4)	0(0.0)	28(14.5)	32(16.6)	0(0.0)	2(1.0)	0(0.0)	50(26.0)
Total	+1716 (75.7)	332 (19.3)	298 (17.3)	80 (4.6)	302 (17.7)	356 (20.7)	42 (2.4)	22(1.2)	40(2.3)	244 (14.2)

* Express as a percentage of clinical signs
\+ Express as a percentage of those examined
MSP = Musculo-skeletal pain

Table 2: Sex Distribution of Onchocercal Clinical Signs in Imo-River Basin.

Sex	Number Examined	Number Infected	Leopard skin	Other Onchoder matitis	Hernia	MSP	Nodules	Eye lesions	Hanging groin/elephantiasis	Female genital swelling	Blindness	Total
Male	836(36.6)	484(57.8)	126(15.0)	130(15.5)	32(3.8)	130(15.5)	164(14.6)	16(1.9)	22 (2.6)	0(0)	100 (14.3)	720 (86.1)
Female	1442 (62.5)	642 (44.2)	206 (14.2)	168 (11.6)	48(3.3)	172 (11.9)	192 (13.3)	26 (1.8)	0(0)	40 (2.7)	144 (9.9)	996 (69.0)
Total	2278	1126 (49.4)	+332 (19.3)	298 (17.3)	80 (4.6)	302 (17.5)	356 (20.7)	42 (2.4)	22 (1.2)	40 (2.3)	244 (14.2)	1716 (75.3)

\+ Expressed as Percentage of those examined

Table 3: Distribution of onchocercal lesions by Age in Imo River Basin.

Age Groups (years)	10-19	20-29	30-39	40-49	50+	Total
No. Examined	412	200	378	516	772	2278
No. Infected	156	64	176	286	444	
Clinical Signs						
Leopard Skin	-	20	56	116	140	332
Other onchodermatitis	30	26	50	68	124	298
Nodules	50	16	50	80	160	356
MSP	4	12	46	84	52	198
Lymphatic lesions	4	-	38	48	52	142
Blindness/Eye lesions	4	8	34	104	136	286
Total	92	82	274	500	768	1716
Percentage	+22.3	41.0	72.4	96.8	99.4	75.3

+ Expressed as percentage of those examined
MSP = Musculo - skeletal pain

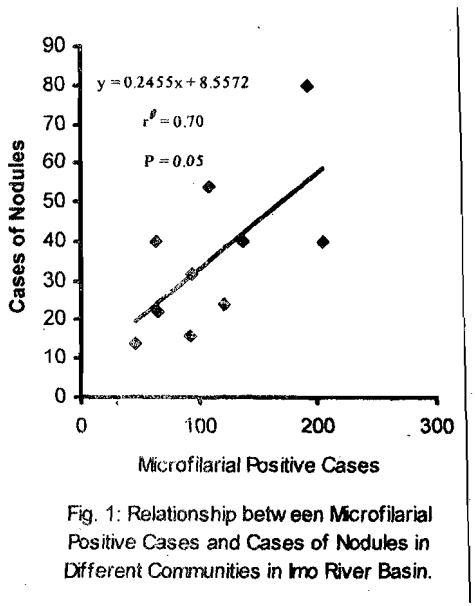

Fig. 1: Relationship between Microfilarial Positive Cases and Cases of Nodules in Different Communities in Imo River Basin.

highest prevalence was recorded in Okata (65.8%) followed by Uzinomi (62.2%), while Umule had the least (35.1%). (Table 4). The intensity of microfilariae was highest in the age group of 10-19 years old (11.8ME skin snip) followed by those of 20-29 years old (10.7) skin snip, while those of 50 years and above had the least (5.7 skin snip) (Table 4).

DISCUSSION

The high prevalence of onchocercal lesions and the high endemicity (as measured by the prevalence of palpable nodules) indicate that onchocerciasis is still a public health problem in the area. High endemicity according to Edungbola *et al.*; (1993) connotes high rate of blindness with the highest morbidity rate particularly among the economically active adults. The very high rate of blindness, skin and lymphatic lesions recorded in this survey is not surprising then. The blindness rate compared favourably with those of the savanna regions. The area must then be one of the transitional places in West Africa with strains of *O. volvulus* causing severer oncho-blindness than the savanna type (Mc Mahon *et al.*, 1988).

The strong association between microfilariae rate and nodule and leopard skin rates confirms the fact that these two lesions have diagnostic value and can be used as indices for the selecting of endemic areas foi mectizan distribution. This finding agrees with those of some earlier workers, including Nwoke (1993) and Edungbola *et al.*; (1993). Since the other lesions are not strictly pathognomonic of onchocerciasis they are not used as indices (Nwoke, *et al.;* 1994), even though their prevalence may equally correlate with that of the microfilariae.

The prevalence of clinical lesions did not increase with closer proximity to river system in this survey. Both the community with the highest number of lesions and that with the lowest were found to lie within distances of 2Km or less from major river sources during the study. The variation can only then be attributed to the presence or otherwise of functional health center and good access roads. Umuhu community with the lowest prevalence is located on the Enugu-Portharcourt express road. With such good road, the villagers can easily travel to big towns like Umuahia, Okigwe and Aba for quick and proper medical treatment. The association

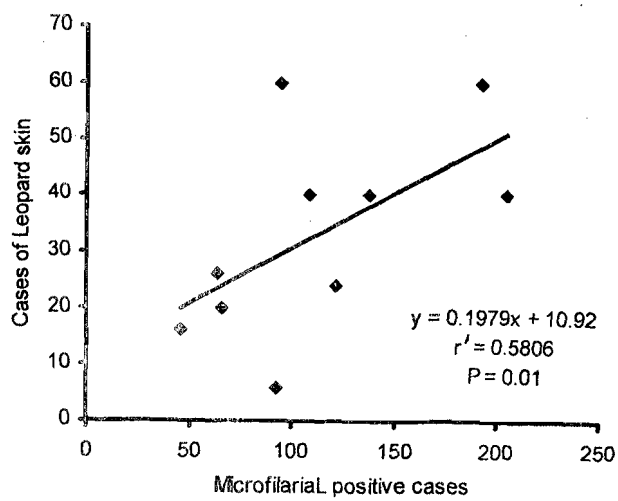

Fig.2: Relationship between microfilarial positive cases and cases of leopard skin in Imo River Basin.

Table: 4. Prevalence and intensity of human onchocerciasis in communities in Imo River Basin.

Community	No.(%) Examined	No(%) Infected	Mean Microfilaria Intensity (Microfilariae/2mm skin bite) Age groups (years)					
			10-19	20-29	30-39	40-49	50+	Mean Total
Onicha	140	64(45.7)	13	10	10	6	5	7.9
Ezmba	384	192(50.0)	14	12	13	6	5	9.4
Okata	164	108(65.8)	7	8	6	6	6	6.3
Uzinomi	196	122(62.2)	10	11	6	7	5	5.2
Awuchinumo	346	138(39.9)	11	11	8	5	5	6.0
Umuoma	248	92(37.0)	12	12	7	5	5	3.7
Abueke	328	204(62.1)	13	11	8	7	7	6.3
Ofeme	188	94(50.0)	14	10	8	6	6	5.7
Umuhu	96	46(47.9)	9	7	5	5	3	4.7
Nkwoegwu	188	66(35.1)	16	12	12	8	9	10.9
Total	2278	1126(49.4)	11.8	10.7	8.6	6.3	5.7	6.6

between access roads and onchocerciasis have been treated by many researchers including Nwoke (1986).

Sex-related prevalence of onchocercal lesions followed the pattern observed by Anderson *et al.*, (1974) and Anosike and Onwuluoha (1995). The highest number of lesions recorded for the male may be due to more risky jobs undertaken solely by them. It was observed during the survey that only the male folk are involved in occupations like fishing and digging near riverbanks.

The prevalence of clinical lesions was found to increase with advancing host age. This is in agreement with the findings of earlier workers (Duke, 1981, Nwoke *et al.*, 1989). Onchocerciasis is a chronic disease and thus infections (lesions) acquired earlier in life progresses as the patient advances in age. Manifestations like leopard skin, blindness, hanging groin and elephantiasis were more of less restricted to the older age groups in this survey. These however are looked upon as terminal complications of long-standing onchocerciasis (Eungbola and Asaolu, 1984).

Based on the present observations, onchocerciasis is still a public health problem in this area. The high microfilarial prevalence, endemicity and frequency of lesions sound a serious warning. The low intensity recorded in this survey, coupled with the on-going mectizan distribution should have made the control of the disease in this area feasible. But the area is noted for low compliance with mectizan treatment (Oparaocha, 1999). The control can only be possible then if comprehensive health education and mobilization of the masses for better compliance form an integral part of the on-going ivermectin distribution.

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