

## Onchocerciasis In Imo State, Nigeria, 7: Prevalence Of Some Non-Classical Signs And Symptoms.

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### Abstract

An assessment of the prevalence of some non-classical signs and symptoms of onchocerciasis was conducted in 38 rural communities in the Imo River Basin, Nigeria between March 1999 and September 2000. A total of 7348 consenting individuals (3756 males and 3592 females) aged 5 years and above were examined for signs and symptoms including musculoskeletal pain, general debility and epilepsy. Two bloodless skin snips were also taken from each individual for microfilariae of *Onchocerca volvulus*. Out of the 7348 persons examined, 2613 (35.6%) had various non-classical signs and symptoms. The prevalence rates of musculoskeletal pain, general debility and epilepsy were higher in persons with skin microfilariae (67.1%, 54.3% and 1.6% respectively) than in those without skin microfilariae 5.5%, 14.2% and 0.2%. Musculoskeletal pain and general debility increased in relation to microfilarial rate/intensity of infection and age of the subjects while epilepsy was associated only with the 10-59 year age group with peak prevalence (1.5%) in subjects 20-29 years. Females had higher prevalence rates of non-classical signs and symptoms namely, musculoskeletal pain (24.1%), general debility (17.4%) and epilepsy (0.7%) than males 14.8%, 14.1% and 0.3% respectively. Overall, musculoskeletal pain and general debility were strongly associated with intensity of infection ( $r = 0.64$ ;  $p < 0.001$ ) and ( $r = 0.53$ ;  $p < 0.001$ ) respectively while epilepsy showed a weak relationship with intensity of infection ( $r = 0.14$ ,  $p > 0.364$ ). The result shows that non-classical signs and symptoms are important aspects of the onchocerciasis<sup>1</sup> disease in the Imo River Basin, Nigeria. The sustenance of treatment with ivermectin taking into account standard exclusion criteria is advocated.

**Keywords:** Onchocerciasis, prevalence, musculoskeletal pain, general debility, epilepsy.

### Introduction

Onchocerciasis caused by *Onchocerca volvulus* constitutes a major public health problem and an obstacle to socioeconomic development where an estimated 18 million individuals are infected with 270,000 blind, 500,000 with low vision and over 6 million with skin disease (WHO, 1995). The major manifestations, which are so far known to contribute significantly to the disease burden, are the ocular and skin lesions (including troublesome itching) (Kale, 1998). Very little is known about other manifestations, particularly those of uncertain association, aetiology and pathogenesis including musculoskeletal pain, general debility, low body weight, epilepsy and in Africa, dwarfism (WHO, 1995). This makes it difficult to appreciate their contributions to disease burden as well as identify priorities for their control. The study was designed therefore, to investigate the prevalence of some non-classical signs and symptoms of onchocerciasis in the Imo River Basin of Nigeria where no previous data exist.

### Materials and Methods

**Study area:** This study was carried out in 38 rural communities in parts of the Imo River Basin, southeastern Nigeria located between Latitude 5° 40' - 5° 57'N and Longitude 7° 10' - 7° 26' E. The terrain is hilly with fast flowing streams and rivulets, which form the Imo River, the main river in the area. The presence of various geological formations in the riverbeds results in resistant rapids, which create favorable breeding sites for the vector species in the area, *Simulium damnosum*. The climatic seasons are well defined namely: a dry season from October to March and a wet season from April to September. The range of annual rainfall in the area is between 1700 and 2000mm with average relative humidity of about 80% and mean annual temperature of 29° C. The vegetation is rainforest. Subsistence farming, fishing, hunting, wine tapping and petty trading are the main occupations of the people who are of Ibo ethnic origin.

### Study sample and methods of data collection:

Informed consent was obtained from all patients according to the guidelines of the authors' institution. The Institutional Review Board of the Imo State University Owerri, Nigeria and University of Jos, Nigeria reviewed and approved this study. Following the mobilization of the communities and a census based on a house-to-house survey conducted with the help of village-based field assistants (males and females), 7348 individuals (3756 males and 3592 females) aged 5 years and above were identified and enlisted for the study. Each person was examined clinically by the physician and team leader (INSD) and as well as interviewed about their experiences relating to non-classical signs and symptoms. The criteria used to assign subjects as possible MSP patients included report of chronic backache, muscle pain, chest pain, joint pain, and hip pain (Pearson, 1988). Subjects assigned as general debility patients reported persisting conditions of weakness with lack of muscle tone. Definition of a case of epilepsy was as described by Kaiser *et al* (1996). At each village, village heads were asked if they had cases of epilepsy using the term for this condition in the local language. Identified persons were considered as "possible" epileptics following confirmation by the head of the household or a close relative who had previously observed episodes of seizures. Patients were further examined for wounds, burns or scars suggesting injuries sustained during episodes of seizures. All "possible" epileptics received basic neurological examination by a trained neurologist with special training in epileptology.

After the clinical examination/interviews, 2 bloodless skin snips were taken from the left and right iliac crest of each person using the Holth type corneoscleral punch (2mm, Storz Ltd Japan). Each skin biopsy was placed in a microtitre plate (Flat-bottom, 96 wells) containing three drops of physiological saline and incubated for 24 hours. Emerged microfilariae (mf) were observed and counted. The microfilarial load of each person was expressed as the number of mf per skin snip. The mean microfilarial load (i.e. intensity of infection) was calculated for all skin-snip positive persons. Data collected was stratified by age and sex and analyzed using SAS software (Release 6.11) (SAS, 1995).

### Results

The result showed that out of 7348 persons examined, 2615 had various non-classical signs and symptoms. The prevalence rates of these non-classical signs and symptoms namely musculoskeletal pain, general debility and epilepsy were higher in persons with skin microfilariae

67.1%, 54.3% and 1.6% respectively than in those without skin microfilariae 5.5%, 14.2% and 0.2% (Table 1). Non-classical signs and symptoms were absent in the 5-9 year group (Table 2). The prevalence rates of musculoskeletal pain and general debility increased with increase in microfilarial rate and intensity of infection. Epilepsy was associated only with the 10-59 year age group with peak prevalence (1.5%) in subjects 20-29 years. Females had higher prevalence rates of non-classical signs and symptoms namely, musculoskeletal pain (24.1), general debility (17.4%) and epilepsy (0.7%) than males 14.8%, 14.1% and 0.3% respectively. Overall, musculoskeletal pain and general debility were strongly associated with intensity of infection ( $r = 0.64$ ;  $p < 0.001$ ) and ( $r = 0.53$ ;  $p < 0.001$ ) respectively while epilepsy showed a weak relationship with intensity of infection ( $r = 0.14$ ,  $p > 0.364$ ).

### Discussion

The present study confirms the prevalence of onchocerciasis and its non-classical complications in endemic communities in the Imo River Basin of Nigeria. Previous studies had shown that non-classical complications are common features of rainforest onchocerciasis (Nwoke *et al.*, 1994). Musculoskeletal pain was the most prevalent non-classical complication in the area. The relationship between onchocerciasis and musculoskeletal pain is well known. Lamp (1967) found that 63.7% of the 77 patients diagnosed as having onchocerciasis in Ile-Ife, Nigeria presented with muscular or joint pains. Thompson's (1971) experience on a Cameroon oil palm estate where 87% of his workers showed evidence of onchocerciasis was that musculoskeletal pain caused more frequent complaints and prolonged disability than skin lesions. The potential use of musculoskeletal pain as a premonitory sign or symptom in rapid, low cost diagnosis of onchocerciasis has also been advocated (Nwoke, 1992). About 54.3% of subjects with positive microfilarial skin biopsy presented with general debility. Until now, not much is known in the biomedical literature about its relationship with human onchocerciasis. However, the establishment of a strong association between general debility and intensity of infection in the present study suggest a causal role for *O. volvulus* in its aetiology. Our findings do not preclude other confounding pathogenic variables in the environment like helminthiasis, plasmodiasis etc that can result in debilitation. Until recently, the prevalence of epilepsy was attributed mainly to neurocysticercosis due to *Taenia solium* (Commission on Tropical Diseases of The International League against Epilepsy, 1994). New findings however, have shown a significant

**Table 1: Prevalence of non-classical signs and symptoms of onchocerciasis in the study area**

Non-classical signs and symptoms	Number (%) positive for persons with skin mf (n = 1655) <sup>a</sup>	Number (%) positive for persons without skin mf (n = 5093)
Musculoskeletal pain	1110 (67.1)	312 (5.5)
General debility	899 (54.3)	810 (14.2)
Epilepsy	26 (1.6)	12 (0.2)

<sup>a</sup>in some cases, a subject presented with more than one sign or symptom was recorded.

**Table 2: Age and sex-related prevalence of non-classical onchocerciasis signs and symptoms and intensity of *O. volvulus* infection among subjects in the study area**

Age group (years)	Number examined	No. (%) infected with mf	No. (%) with non-classical onchocerciasis			mfd <sup>a</sup>
			Musculoskeletal Pain	General Debility	Epilepsy	
5 – 9	870	64 (7.4)	0 (0.0)	0 (0.0)	0 (0.0)	4.1
10 – 19	985	115 (11.7)	46 (4.7)	27 (2.7)	2 (0.2)	7.3
20 – 29	1238	176 (14.2)	143 (11.6)	61 (4.9)	19 (1.5)	8.1
30 – 39	1321	225 (17.0)	288 (21.8)	178 (13.5)	8 (0.6)	13.9
40 – 49	1350	317 (23.5)	465 (34.4)	404 (29.9)	8 (0.5)	15.4
50 – 59	950	426 (44.8)	333 (35.1)	275 (28.9)	1 (0.1)	14.3
60 +	634	332 (54.4)	147 (23.2)	208 (32.8)	0 (0.0)	12.1
Males	3756	862 (22.9)	556 (14.8)	528 (14.1)	13 (0.3)	4.5
Females	3592	793 (22.1)	866 (24.1)	625 (17.4)	25 (0.7)	6.3
Total	7348	1655 (22.5)	1422 (19.4)	1153 (15.7)	38 (0.5)	10.7

<sup>a</sup>Microfilarial density expressed as microfilariae (mf) per mg skin snip for positive persons in the study area

association between epilepsy and onchocerciasis in the absence of *T. solium* (Kaiser *et al.*, 1996). Active epilepsy was confirmed in 38 subjects in the present study of which 16 (42.1%) had positive skin biopsies. Further studies are required to clarify the actual role of *O. volvulus* in the aetiologies of general debility and epilepsy.

All non-classical signs and symptoms occurred in subjects 10 years and above with higher prevalences and intensities of infection in those >30 years. The import of this on the socioeconomic development of the area is significant. Musculoskeletal pain for instance, gives not only prolonged discomfort, but reduces the capacity to do manual work. Since these subjects are mainly farmers who produce food and industrial raw materials for sustaining the meager economy of rural households, the consequent morbidity result in production and income losses (Dozie, 2002). Furthermore, musculoskeletal pain in this age category affects sexual relationship and might result in maternal mortality due to the inability to "push down" during labour because of associated pains (Ukaga, 1997).

Patients with musculoskeletal pain reportedly got relief after diethylcarbamazine treatment (Shell, 1981). Currently, onchocerciasis is being controlled in Africa using a single annual dose of ivermectin under the community self-treatment strategy of the African Programme for Onchocerciasis Control (APOC). The efficacy of ivermectin in controlling clinical as well as non-

clinical disease has been documented (Ukaga *et al.*, 2001). As a result of the public health nature of non-classical signs and symptoms and their socioeconomic implications, it is suggested that treatment in the area with ivermectin be sustained taking into account the various exclusion criteria.

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