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Prevalence and socio-economic effects of onchocerciasis in Okpuje, Owan West Local Government Area, Edo State, Nigeria.

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ABSTRACT: A survey of the prevalence and socio-economic effects of onchocerciasis in Okpuje, Owan West L.G.A. of Edo State, Nigeria, was undertaken. Of the 655 persons enumerated in the community, a total of 200 subjects (102 males and 98 females) were randomly chosen for the study. The people were skin – snipped after undergoing a physical examination by a physician. The overall prevalence of infection was 47.5%. The symptomatic manifestations of the disease were: Leopard skin recorded the highest prevalence of 40.5%, ocular lesion, 14%; nodules, 10.5% and lizard skin, 7.5%. More males (27.5%) than females (20%) had onchocerciasis but the difference was not statistically significant ($P > 0.05$). However, age had a significant effect on the prevalence of onchocerciasis ($P < 0.001$). Socio-economic studies using structured questionnaires and interviews were carried out. The results indicated that onchocerciasis was associated with a variety of adverse social and economic effects on the people. 40.5% of subjects, mainly farmers and artisans, that presented with pruritus or itching complained of insomnia, general fatigue and lack of concentration at work, with a net effect of low productivity. Some children of infected parents reportedly dropped out of school. 14% of females with ocular lesions had given up jobs such as sewing, weaving and hair plaiting because of visual impairment thus leading to loss of personal and household economic productivity. 93.3% of subjects with lizard skin and 50.5% of those with leopard skin presented with varying levels of body disfigurement, had high level of low self-esteem, marital problems and social stigma.

Keywords: Onchocerciasis; River blindness; Okpuje; Edo State; Nigeria.

Introduction

Onchocerciasis is a chronic parasitic infection caused by the filarial nematode, *Onchocerca volvulus*. The disease is transmitted from one individual to another through the bites of the black fly, *Simulium damnosum*, of the family Simuliidae (Nwoke, *et al.*, 1991). The clinical features of the disease occur in dangerous ocular and dermal manifestations. Onchocerciasis is a major cause of blindness in parts of Africa where it represents a serious obstacle to socio-economic development, (Abiose, 1993; WHO, 1995)

About 125 million people worldwide are estimated at risk of Onchocerciasis and of these, 18 million people are infected with the disease, of whom 99% live in Africa (Etyaale, 2001). The disease affects about 10 million people living in scattered foci in the Savannah and Rain forest regions of Nigeria (WHO 1991).

From the limited pioneer research on human onchocerciasis concentrated mainly in the northern parts of Nigeria, a lot more extensive recent research works have been carried out in different parts of the country

(Nwoke and Dozie, 2002). However, there are still many endemic areas that have not yet been studied in detail.

This survey was carried out to investigate the prevalence, symptomatic effects in relation to sex and age of the people, and the socio-economic effects of Onchocerciasis in Okpuje, a rural farming community in on ochocerciasis meso-endemic area of Edo State, Nigeria

Materials and Methods

The study area is Owan West Local Government Area (LGA) in Edo State, Nigeria. It lies between longitudes 5° 40' E and 6° 10' E; and latitudes 6° 45' N and 7° 15' N. It is located within the forest-Savannah transition area of Nigeria. The study area lies in a tropical climate.

The survey was carried out in Okepuje, a rural community in the Local Government Area. A house to house census was conducted to establish the population at of 655 people. Physical examination of 200 volunteers, above the age of 5 years, randomly chosen, was undertaken by a physician assisted by some health officials, to determine the clinical manifestations of Onchocerciasis. Blood free skin snips were taken from the volunteers using the 2mm bite corneo-sclera punch (E1802, Holt storz, Germany (Okaka, *et al*, 2003)

A structured questionnaire was administered and a friendly interview was conducted on the respondents, who are twenty years and above in age, to determine the general perception of the disease by the people and its socio-economic effects on the community.

Results

Prevalence

Based on the skin snip positivity for *Onchocerca volvulus*, microfilariae from the 200 volunteers, the overall prevalence of infection was 47.5% (Table 1). The symptomatic effects of the disease recorded in descending order were: Leopard skin (40.5%), itching or prurities (18.5%); ocular lesion, (14%), nodules (10.5%) and lizard skin (7.5%).

Although the males had a higher prevalence of onchocerciasis (27.5%) than the females (20%), the difference was not statistically significant ($P > 0.05$). However, age had a significant effect on the prevalence of onchocerciasis ($P < 0.001$). People in the 70 years and above age group (out of the eight age groups) had the highest prevalence of infection (68%) closely followed by those in the 60 – 69 years age group who also exhibited all the symptoms recorded in the study. Individuals in the 05 – 09 years age group recorded no symptom of the disease (Fig. 1).

SOCIO-ECONOMIC EFFECTS

Itching or pruritus:

Itching was observed as the most troublesome symptomatic effect that was not age specific. The study subjects described itching as painful with a compelling, irresistible and self destructive behaviour. 40.54% of the study subjects who presented with itching complained that the disease prevented them from sleeping at night as individuals spent the whole night scratching. 16.2% of the subjects said they were in distress and felt frustrated. 13.5% of the subjects reported that unrelenting scratching reduced their strength and resulted in lack of concentration at work while 12.7% admitted that their education suffered due to distractions in class caused by constant itching.

Table 1: Skin snip positivity for *Onchocera volvulus* microfilariae.

Location	Sex	Age Groups (in years)								Grand Total
		05-09	10-19	20-29	30-39	40-49	50-59	60-69	70+	
Ivbiidohen	Female									
	No Examined	2	2	5	5	11	9	1	4	39
	No Positive	0	0	0	2	4	4	1	4	15
	%	0%	0%	0%	40%	36%	44%	100%	100%	38.46%
	Male									
	No Examined	3	2	14	4	8	16	8	6	61
	No Positive	0	1	1	2	5	10	6	6	31
	%	0%	50%	2	50%	63%	63%	75%	100%	50.81%
Oah	Female									
	No Examined	3	3	5	9	10	10	11	8	59
	No Positive	0	1	3	3	4	7	4	3	25
	%	0%	33%	60%	33%	40%	70%	36%	38%	42.37%
	Male									
	No Examined	2	1	5	4	7	5	10	7	41
	No Positive	0	0	2	4	4	4	6	4	24
	%	0%	0%	40%	100%	57%	80%	60%	57%	58.53%
Total	Female	5	5	10	14	21	19	12	12	98
	No Positive	0	1	3	5	8	11	5	7	40
	%	0%	20%	30%	36%	38%	58%	42%	58%	40.81%
	Male	5	3	19	8	15	21	18	13	102
	No Positive	0	1	3	6	9	14	12	10	55
	%	0%	33%	16%	75%	60%	67%	67%	77%	53.92%
Grand Total	(male & Female)	10	8	29	22	36	40	30	25	200
	No. Infected	0	2	6	11	17	25	17	17	95
	%	0	25	20.6	50	47.2	62.5	56.6	68	47.5

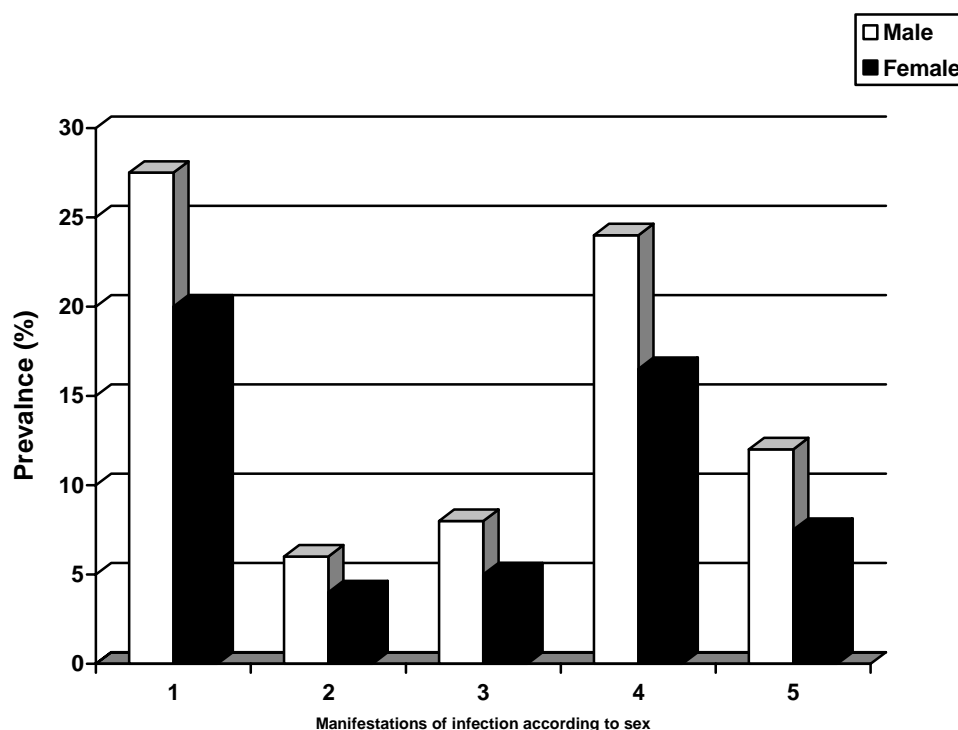


Fig.1 Prevalence of manifestation of onchocerciasis according to sex

Nodules:

A good percentage (23.8%) of the subjects who presented with nodules reported that they had spent a lot of money (resources) to cure or eliminate the subcutaneous swellings. They alleged that people avoided coming into close contact with them, thereby limiting their social interactions in the community. Besides, unpleasant remarks were often made about them, thereby reducing their self – esteem and reputation. 11% of the subjects reported declining sales in their business/trading.

They alleged that people often avoided buying their wares, mostly food items, when they noticed the nodules on their faces.

Ocular lesion:

Fourteen percent of the subject, who presented with ocular lesion, reported giving up jobs such as sewing, weaving and hair plaiting because of their visual impairment, thus leading to loss of personal and household economic productivity.

Lizard skin

A large percentage (93.3%) of subjects with lizard skin had a premature ageing appearance. They were unhappy and felt frustrated. They resorted to covering affected parts of the body with clothes, to avoid social stigma and the embarrassment of being ostracized.

Discussion

The overall prevalence of onchocerciasis recorded in this study was 47.5%. This figure compares favourably with the 48.6% prevalence reported by Edungbola and Asaolu (1984) in Kwara State, Nigeria, but higher than the 26.9% recorded by Nwaorgu, *et al.*, (1994) in an onchocerciasis mesoendemic area of Enugu State, Nigeria. However, Akinbo and Okaka (2005) reported a high overall prevalence (83%) of the disease in Ovia North East L.G.A., Edo State, Nigeria.

Although the prevalence of Onchocerciasis recorded in this study indicated a low prevalence probably due to previous mass ivermectin treatment, the figure of 47.5% prevalence did not show, a satisfactory level of microfilaraemia in the population.

The symptomatic effects of onchocerciasis recorded in this survey were: Leopard skin (40.5%); itching or pruritus (18.5%) ocular lesion (14%); nodules (10.5%) and lizard skin (7.5%). While other known symptomatic effects of the disease such as lymphadenopathy and blindness were not recorded. Leopard skin recorded the highest prevalence in this study. A similar finding was made by Carne, *et al.*, (1993), who reported a pre-tibial depigmentation prevalence of 30% - 40% for individuals aged over 50 years in Uganda. Edungbola, *et al.*, (1983) found a higher prevalence rate of leopard skin in the savannah zone than in the forest zone in Nigeria. The preponderance of leopard skin in this survey could be attributed to chronic onchocerciasis as suggested by Connor and Palmieri (1985) and Nwoke, *et al.*, (1991). Another possibility could be that ivermectin treatment had a significantly higher modification or clearing effect on itching or pruritus than on other skin condition such as leopard skin. Nevertheless, Okpuje located in the forest-savannah transition zone could have peculiar strains of the parasite or it might have been due to differences in the host immunological responses as suggested by Anderson, *et al.*, (1974), and Anderson and Fuglsang (1977).

More males (27.5%) than females (20%) were infected by the disease in this survey. The difference though not statistically significant ($P > 0.05$) relatively points to a sex-related prevalence of onchocerciasis as reported by Edungbola, *et al.*, (1983) Nwoke, *et al.*, (1991), Anosike and Onwuliri (1995); Oparaocha and Odaibo (1997). However, Akinbo and Okaka (2005) reported a higher prevalence of infection in females (93.1%) than in males (74.5%) in Ovia North East L.G.A., Edo State, Nigeria. The difference in the infection rate according to sex may be due to endemicity (Nwoke, *et al.* 1991); the occupational exposure (Onwuliri *et al.*, 1987) and to some extent on the susceptibility, of individuals. At OKpuje, most farmers are men, who stay more outside the house than women, and hence have a greater exposure to bites by vector black flies. Eneanya and Nwaongu (2002) noted that although both males and females engaged in farming, women are better clad and therefore there was less exposure of large parts of their bodies especially the lower limbs to *Simulium damnosum* bites.

In this survey, age significantly affected the prevalence of onchocerciasis ($P < 0.001$). Respondents in the 60-69 years age group not only had the second highest prevalence of symptoms of the disease but also exhibited all the symptoms. Those in the 70 years and over had the highest rate of infection (68%), while subjects in the 5 – 9 years age group had no symptoms of infection. The results are similar to findings reported by Edungbola, *et al.*, (1983); Somori (1983); Nwoke, *et al.*, (1991); Anosike and Onwuliri (1994) and Courtright, *et al.* (1995), which have shown that onchocerciasis infection rate increase gradually with advancing age in Nigeria.

The greatest burden of onchocerciasis are impaired visual acuity and blindness, and dermatitis which reduces life expectancy, decreases agricultural productivity, forces children out of school and results in the emigration of the work force (WHO, 1995, 1998, Asuzu, *et al.*, 1997). However in the present survey no case of blindness was recorded.

The subjects, in this study, who presented with ocular lesion, reported giving up jobs such as sewing, weaving and hair plaiting because of visual impairment. According to WHO (1976) visual impairment incapacitates a large segment of the community and makes them an economic burden. Ukoli (1992) stated that onchocerciasis is of great importance in tropical Africa because it incapacitates a large segment of the adult working population and prevent them from reaching their maximum productivity capacity.

The subjects affected by the troublesome itching in pruritis experienced general fatigue, insomnia and distraction at work as a consequence of low productivity. While their education suffered due to distraction in class caused by constant itching. Similar findings have been made by Etya'ale (2001) who reported in his recent studies in Nigeria, Ethiopia and Sudan, that onchocerciasis is responsible for the poor school performance and a higher drop-out rate among infected children (due to itching, lack of sleep etc). The report further stated that low productivity, low income and higher health related costs are found among

infected adults. TDR (2001) reported that children were at least twice likely to drop out of school if the head of their household suffered from troublesome itching or pruritis.

Other onchocercal skin diseases such as nodules, rash, leopard skin and lizard skin presented victims with varying levels of body disfigurement and premature ageing appearance. The victims claimed that their self – esteem and social stature were severely lowered. While of the affected females claimed that they had difficulties in finding good spouses. This could lead to low marriage rate in the community. Similar findings have been reported by the Pan African study Group (WHO, 1995). This negative social effect of the disease was corroborated by Amazigo (1994) who reported that onchocerciasis interfered with breast – feeding among woman affected by the disease. Amazigo and Obikeze (1991) found that onchocercal skin disease delayed and interfered with marriage prospects and future happiness of adolescent girls in Etteh, Nigeria. Also Eneanya and Nwaorgu (2001) reported that people with onchocercal skin disease felt frustrated. They were stigmatized, feared and avoided.

From this survey, it was obvious that onchocerciasis was of public health importance at Okpuje, Edo State, Nigeria. The disease had adversely affected the social and economic life of the population. Onchocerciasis is associated with significant levels of stigma which cuts across the entire aspects of life in the community. While some people pity those infected by the diseases, others despise them. Treatment of the disease take a long time and it is costly. Infected individuals are burdened with low marriage rate, falling birth rate, drop in productivity, economic stagnation or decline, and social disintegration. The disease adversely affects the productive population, including farmers, artisans, traders etc as well as school children.

The on-going community-directed treatment with ivermectin (CDTI) for the control of onchocerciasis in endemic areas of Nigeria including Okpuje, by the African Programme for Onchocerciasis Control (APOC) (Nwoke and Dozie, 2002) should greatly reduce to a tolerable level, the morbidity related to the disease. This would improve the overall health status, enhance the social interactions and increase the economic productivity of the people.

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