

# Prevalence of Onchocerciasis Syndrome in Ise-Orun Local Government Area of Ekiti State, Nigeria

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**Abstract.** Twenty seven towns and villages in the Ise-Orun local government area of Ekiti State, Nigeria are in the grip of onchocerciasis. Out of the 2045 subjects examined, 1131 (55.3% at 95% confidence interval- CI, 0.53-0.57) were found to be infected by the disease. The prevalence of onchocerciasis varied from one town or village to the other in the area of study. The peak prevalence (80.5% at 95% CI, 0.73-0.89) was recorded in the village Temidire. The people aged 50-59 years accounted for peak prevalence (72.0% at 95% CI, 0.63-0.81). Out of the total 2045 subjects examined, 51.0, 26.8, 19.2 and 3.0% were, respectively, found to be suffering from crawl-crawl, leopard skin, nodules, and partial blindness.

**Keywords:** dermatology, onchocerciasis infection, *Onchocerca volvulus*, crawl-crawl disease, leopard skin disease

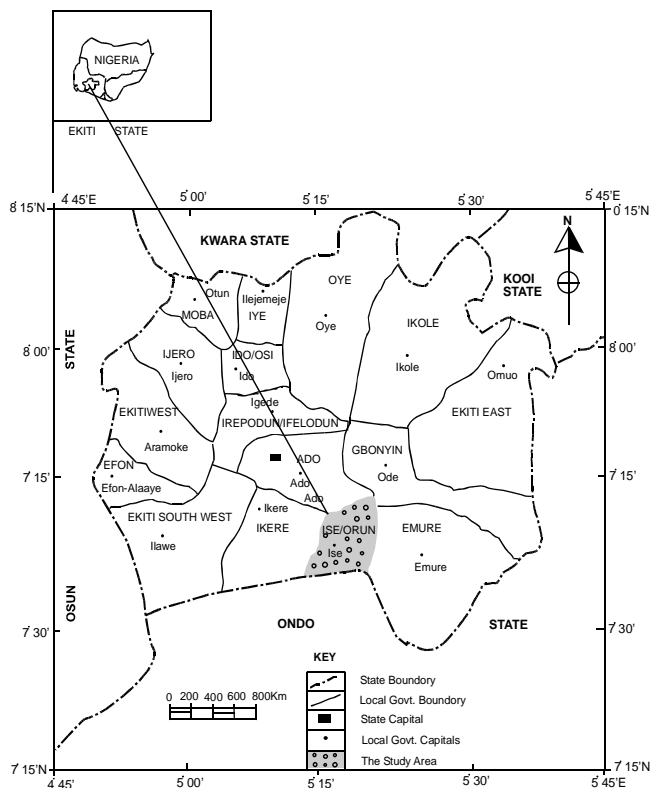
## Introduction

*Onchocerca volvulus* causes one of the most disabling and debilitating diseases known to man (Braide *et al.*, 1982). The disease caused by *O. volvulus*, however, is non-periodic, unlike some forms of filarias, which are either nocturnal or diurnal in periodicity (Branin, 1990). The activity of this microfilarial worm results in to dermatological, lymphatic and ophthalmological conditions, which can be grouped together as onchocerciasis syndrome (Hagon, 1998). Dermatological manifestations of onchocerciasis have also been noted to be associated with changes in the skin (Kale, 1998; Murdoch, 1993; Hay, 1989). Apart from its medical importance, onchocerciasis has been identified as an important factor in the economy of Tropical Africa, as it incapacitates a large segment of adult population, thus preventing them to achieve their maximum productive capacity. The disease has, in the past as well as at present, prompted some communities to abandon their fertile land for less productive areas in order to save themselves from the ravages of the onchocerciasis disease (Newoke, 1990). The present study was, therefore, aimed at investigating the rate of overall dermatological and clinical manifestations of onchocerciasis in the Ise-Orun local government area in the Ekiti State, Nigeria.

## Materials and Methods

**Study area.** This study was carried out in 27 towns and villages in the Ise-Orun local government area of the Ekiti State (Fig. 1). The inhabitants of these towns and villages are mostly farmers, cultivating yam, cassava, maize and cocoa,

while some are fishermen. They are mostly indigenous to these towns and villages, except for a few health workers, artisans and civil servants working as temporary residents. The roads leading to these towns and villages are bad, almost not



**Fig. 1.** Map of Ekiti State showing sampling towns and villages of the Ise-Orun local government area studied for the prevalence of onchocerciasis syndrome.

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motorable, thus making the areas of having poor accessibility. The parameters of the present study included the prevalence of onchocerciasis syndrome in various towns and villages by the gender (Table 1), by different clinical and dermatological manifestations (Table 2), and by the age-groups in different genders (Table 3).

**Data collection.** The data were collected with the help of local government medical doctors and health workers to ensure the fullest participation and cooperation of the subjects studied. With the prior consent of residents, random sampling was carried out from every third house of each selected town and

village, to increase the degree of compatibility. The sampling was done in the late afternoon hours when most of the people had returned from their farms and places of work. The name, gender, occupation, age and obvious signs of onchocerciasis such as leopard skin, partial blindness, nodules, and crawl-crawl were recorded on the questionnaire data sheet, in the same manner as carried out by Edugbola *et al.* (1987). Samples of bloodless skin snips were collected from the willing subjects, using a sterilized 1.5 cm screlectomy punch. The snip samples were put in plastic tubes containing 0.2 ml physiological saline and numbered serially for each subject examined. The snips and

**Table 1.** Overall prevalence of onchocerciasis syndrome in relation to various towns and villages recorded by the gender in the area of study, Ise-Orun, Ekiti State, Nigeria

Town/ village	Males			Females			Total		
	subjects examined	subjects infected	CI*	subjects examined	subjects infected	CI*	subjects examined	subjects infected	CI*
Ise	49	20 (40.8)	0.27-0.55	36	10 (27.7)	0.13-0.43	85	30 (35.3)	0.25-0.45
Orun	50	34 (68.8)	0.55-0.81	25	13 (52.0)	0.32-0.72	75	47 (62.7)	0.52-0.74
Idi-Osan	43	17 (39.5)	0.25-0.55	30	19 (63.3)	0.46-0.80	73	36 (49.3)	0.38-0.60
Ajebamidele	49	29 (59.2)	0.45-0.73	42	20 (47.6)	0.33-0.63	91	49 (53.8)	0.44-0.64
Ogbomoso	37	25 (67.6)	0.53-0.83	48	39 (81.3)	0.70-0.92	85	64 (75.3)	0.66-0.84
Adegbola	50	11 (22.0)	0.11-0.33	30	12 (40.0)	0.22-0.58	80	23 (28.8)	0.19-0.39
Bolarindiwa	62	32 (51.6)	0.40-0.64	18	7 (38.9)	0.16-0.62	80	39 (48.8)	0.38-0.60
Ajegunle	47	37 (78.7)	0.40-0.64	25	12 (48.0)	0.28-0.68	72	49 (68.1)	0.57-0.79
Alagbada	51	18 (35.3)	0.22-0.48	21	9 (42.9)	0.22-0.64	72	27 (37.5)	0.27-0.49
Egbira-Eso	61	44 (72.1)	0.61-0.83	30	17 (56.7)	0.39-0.75	91	61 (67.0)	0.57-0.77
Ede	51	39 (76.5)	0.65-0.89	39	14 (35.9)	0.21-0.51	90	53 (58.9)	0.49-0.69
Kajola	32	22 (68.8)	0.52-0.85	40	23 (57.5)	0.43-0.73	72	45 (62.5)	0.52-0.74
Obada	29	13 (44.8)	0.27-0.63	45	20 (44.4)	0.29-0.59	74	33 (44.6)	0.34-0.56
Ogbese	40	34 (85.0)	0.74-0.96	30	13 (43.3)	0.25-0.61	70	47 (67.1)	0.56-0.78
Afolu	41	27 (65.9)	0.51-0.81	31	27 (87.1)	0.75-0.99	72	54 (75.0)	0.65-0.85
Aba-Onisu	42	39 (92.9)	0.85-1.01	43	20 (46.5)	0.32-0.62	85	59 (69.4)	0.59-0.79
Temidire	47	38 (80.9)	0.70-0.92	35	28 (80.0)	0.67-0.93	82	66 (80.5)	0.73-0.89
Aba-Aanu	24	17 (70.8)	0.53-0.89	55	39 (70.9)	0.59-0.83	79	56 (70.9)	0.61-0.81
Aba-Akoti	40	21 (52.5)	0.38-0.68	38	14 (36.8)	0.22-0.52	78	35 (44.9)	0.34-0.56
Olokemeta	32	14 (43.8)	0.27-0.61	28	19 (67.9)	0.51-0.85	60	33 (55.0)	0.42-0.68
Bolorunduro	25	20 (80.0)	0.64-0.96	36	12 (33.3)	0.18-0.48	61	32 (52.5)	0.40-0.66
Araromi	49	34 (69.4)	0.56-0.82	22	8 (36.4)	0.12-0.56	71	42 (59.2)	0.48-0.70
Aba-gara	30	12 (40.0)	0.22-0.58	43	21 (48.8)	0.34-0.64	73	33 (45.2)	0.34-0.56
Aba-Aji	27	9 (33.3)	0.15-0.51	34	13 (38.2)	0.22-0.54	61	22 (36.1)	0.24-0.48
Aba-Ogunlana	41	21 (51.2)	0.36-0.66	29	9 (31.0)	0.14-0.48	70	30 (42.9)	0.31-0.55
Alapeto	39	17 (43.6)	0.28-0.60	32	12 (37.5)	0.12-0.55	71	29 (40.8)	0.30-0.52
Oluoroke	42	19 (45.2)	0.30-0.60	30	18 (60.0)	0.42-0.78	72	37 (51.4)	0.39-0.63
Total	1130	663 (58.7)	0.56-0.62	915	468 (51.1)	0.46-0.56	2045	1131 (55.3)	0.53-0.57

\* 95% confidence interval (CI); within paranthesis are given the respective percentage of infected subjects

the microfilariae, that so emerged, were then pipetted out, placed on the glass slide, and observed under a microscope. The number of microfilariae that found per skin snip was determined. The failure to count fingers from a distance of 3 m during the daylight was used as an index to determine blindness (WHO, 1976). The data so collected were statistically analyzed on confidence interval (CI).

## Results and Discussion

The results of the present investigations were recorded as the overall prevalence of onchocerciasis, on the gender basis, in different villages and towns in the area of study

(Table 1). It was noted that out of the total 2045 people examined in the study (1130 males; 915 females), 1131 (55.3% at 95% CI, 0.53-0.57) were found to be suffering from onchocerciasis. These included 663 males (58.7% at 95% CI, 0.56-0.62) and 468 females (51.1% at 95% C.I, 0.46-0.56). The prevalence of onchocerciasis, however, varied from one town and village to the other in the area of study. The data presented in Table 1 also show the overall peak of prevalence of the infection in 66 people (80.5% at 95% CI, 0.73-0.89) in Temidire village, which included 38 males (80.9% at 95% CI, 0.70-0.92) and 28 females (80.0% at 95% CI, 0.67-0.93). Similarly, least prevalence of the infection in 23 people

**Table 2.** Overall prevalence of onchocerciasis syndrome in relation to dermatological and clinical manifestations in the area of study, Ise-Orun, Ekiti State, Nigeria

Town/ village	Males infected					Females infected					Total infected				
	subjects examined	LS (%)	PB (%)	N.D (%)	CC (%)	subjects examined	LS (%)	PB (%)	ND (%)	CC (%)	subjects examined	LS (%)	PB (%)	ND (%)	CC (%)
Ise	49	35.0	0.0	5.0	60.0	36	20.0	0.0	20.0	60.0	85	30.0	0.0	10.0	60.0
Orun	50	29.4	0.0	11.8	58.8	25	23.1	7.7	30.8	38.5	75	27.7	2.1	17.0	53.2
Idi-Osan	43	47.1	5.9	11.8	35.3	30	21.1	0.0	15.8	63.2	73	33.3	2.8	13.9	50.0
Ajebamidele	49	24.1	0.0	17.2	58.6	42	40.0	0.0	15.0	45.0	91	30.6	0.0	16.3	53.1
Ogbomoso	37	20.0	0.0	40.0	40.0	48	35.9	0.0	20.5	43.6	85	29.7	0.0	28.1	42.2
Adegbola	50	27.3	9.1	18.2	45.5	30	25.0	0.0	41.7	33.3	80	26.1	4.3	30.4	39.1
Bolarindiwa	62	31.3	6.3	25.0	37.5	18	14.3	0.0	14.3	71.4	80	28.2	5.1	23.1	43.6
Ajeganle	47	32.4	0.0	13.5	54.1	25	25.0	0.0	8.3	66.7	72	30.6	0.0	12.2	57.1
Alagbada	51	23.5	5.9	11.8	64.7	21	11.1	33.3	11.1	44.4	72	18.5	14.8	11.1	55.6
Egbira-Eso	61	40.9	6.8	13.6	38.6	30	29.4	0.0	11.8	58.8	91	37.7	4.9	13.1	44.3
Ede	51	30.8	2.6	12.6	53.8	39	42.9	7.1	14.3	35.7	90	33.9	3.8	13.2	49.1
Kajola	33	36.4	0.0	9.12	54.5	40	43.5	0.0	26.1	30.4	72	40.0	0.0	17.8	42.2
Obada	29	21.4	7.1	21.4	50.0	45	20.0	5.0	25.0	50.0	74	21.2	6.1	24.2	51.5
Ogbese	40	17.6	0.0	14.7	67.6	30	15.4	0.0	30.8	53.8	70	17.0	0.0	19.2	63.8
Afolu	41	24.4	2.4	31.7	41.5	31	37.0	7.4	14.8	40.7	72	29.4	4.4	25.0	41.2
Aba-Onisu	42	25.6	10.3	15.3	48.7	43	35.0	0.0	25.0	40.0	85	28.8	6.8	18.6	45.8
Temidire	47	21.1	5.3	26.3	47.4	35	34.2	10.5	18.4	36.8	82	26.6	7.6	21.5	40.5
Aba-Aanu	24	35.3	0.0	11.8	52.9	55	34.5	0.0	6.9	58.6	79	34.8	0.0	8.7	56.5
Aba-Akoti	40	47.6	0.0	4.8	47.6	38	35.7	0.0	14.3	50.0	78	27.8	1.9	14.8	55.6
Olokemeta	32	35.7	0.0	7.1	57.1	28	31.6	0.0	15.8	52.6	60	33.3	0.0	12.1	54.5
Bolorunduro	25	20.0	0.0	25.0	55.0	36	25.0	0.0	16.7	58.3	61	21.9	0.0	21.9	56.2
Araromi	49	29.4	0.0	29.4	41.2	22	37.5	0.0	12.5	62.5	71	30.9	0.0	26.2	45.2
Aba-gara	30	41.7	8.3	33.3	16.7	43	14.3	9.5	19.0	57.1	73	24.2	9.1	24.2	42.4
Aba-Aji	27	11.1	0.0	22.2	66.7	29	30.8	0.0	23.1	46.2	61	22.7	0.0	22.7	54.5
Aba-Ogunlana	41	33.3	0.0	19.0	47.6	32	33.3	0.0	22.2	44.4	70	33.3	0.0	20.0	46.7
Alapeto	39	17.6	0.0	23.5	58.8	30	33.3	0.0	8.3	58.3	71	24.1	0.0	17.2	58.6
Oluoroke	42	10.5	5.3	26.3	57.9	30	38.9	0.0	11.1	50.0	72	24.3	2.7	18.9	54.1
Total	1130	25.9	3.0	18.1	52.9	915	30.8	2.9	17.9	48.3	2045	26.8	3.0	19.2	51.0

LS = leopard skin; PB = partial blindness; ND = nodules; CC = crawl-crawl

**Table 3.** Overall prevalence of onchocerciasis syndrome in relation to age groups and the gender in the area of study, Ise-Orun, Ekiti State, Nigeria

Age group (year)	Males			Females			Total		
	subjects examined	subjects infected	CI*	subjects examined	subjects infected	CI*	subjects examined	subjects infected	CI*
<9	50	10 (20.0)	0.1 - 0.3	41	6 (14.6)	0.04 - 0.26	91	16 (17.6)	0.10 - 0.26
10-19	91	21 (23.1)	0.14 - 0.32	61	8 (13.1)	0.05 - 0.21	152	29 (19.1)	0.13 - 0.25
20-29	251	76 (30.3)	0.24 - 0.36	181	50 (27.6)	0.21 - 0.35	432	126 (29.2)	0.25 - 0.33
30-39	323	235 (72.8)	0.68 - 0.78	201	105 (52.2)	0.45 - 0.59	524	340 (64.9)	0.61 - 0.69
40-49	201	179 (89.1)	0.85 - 0.93	192	11 (57.8)	0.51 - 0.65	393	290 (73.8)	0.70 - 0.78
50-59	100	72 (72.0)	0.63 - 0.81	102	82 (80.4)	0.72 - 0.88	202	154 (76.2)	0.70 - 0.82
60-69	72	50 (69.4)	0.33 - 0.63	4691	34 (73.9)	0.61 - 0.87	163	122 (74.8)	0.68 - 0.82
≥70	42	20 (47.6)	0.33 - 0.63	46	34 (73.9)	0.61 - 0.87	88	54 (61.4)	0.51 - 0.71
Total	1130	663 (58.7)	0.45 - 0.51	915	468 (51.1)	0.48 - 0.54	2045	1131 (55.3)	0.52 - 0.58

\* 95% confidence interval (CI); within paranthesis are given the respective percentage of infected subjects

(28.8% at 95% CI, 0.19-0.39) was recorded in Adegbola vil-  
lage, with 11males (22.0% at 95% CI, 0.11-0.33) and 12  
females (40.0% at 95% CI, 0.22-0.58).

Variability in the prevalence of onchocerciasis in relation to  
dermatological and clinical manifestations in the area under  
study is shown in Table 2. Out of the total 2045 subjects  
examined, 51.0, 26.8, 19.2, and 3.0% were, respectively, ob-  
served to have crawl-crawl, leopard skin, nodules, and partial  
blindness. These disease manifestations were also noted to  
vary with gender; males were 52.9, 25.9, 18.1, and 3.0%, while  
females accounted for 48.3, 30.8, 17.9, and 2.9% for the above  
noted symptoms, respectively.

Table 2 further shows that Adegbola, Alagbada, Kajola and  
Ogbese villages accounted for the peak prevalence of nod-  
ules (30.4%), partial blindness (14.8%), leopard skin (40.0%),  
and crawl-crawl (63.8%), respectively.

The overall prevalence of onchocerciasis in relation to  
age group and gender is presented in Table 3. The peak  
prevalence of the infection (76.2% at 95% CI, 0.70-0.82)  
was observed in the age group of 50-59 years, with 72%  
males (95% CI, 0.63-0.81) and 80.4% females (95% CI, 0.72-  
0.88). Whereas the least prevalence of infection of 17.6%  
(95% CI, 0.10-0.26) was recorded among children of 9 years  
of age, with 20% males (95% CI, 0.1-0.3) and 14.6%  
females (95% CI, 0.04-0.26).

The overall prevalence of 55.3% (Table 1) of onchocercia-  
sis syndrome showed that the onchocercal endemicity in  
the area of study was of medium level (Edugbola *et al.*,  
1987). However, the prevalence of onchocerciasis syndrome

reached the hyperendemic level in the Temidire village,  
where the level of prevalence of onchocerciasis syndrome  
was 80.5% (Table 1). The prevalence of 72% onchocercia-  
sis syndrome among the people of the age group of 50-59  
years further indicated hyperendemic infection in this age  
group (Table 3). The prevalence of infection among the  
economically active subjects was 72.8% and 89.1% in the  
age groups of 30-39 years and 40-49 years among the males,  
while it was 52.2% and 57.8% in the same age groups for  
females, respectively (Table 3). Thus, the prevalence of in-  
fection among 58.7% males was higher than among 51.1%  
females in the area of study. Dermatological and clinical  
manifestations of onchocerciasis syndrome in the area of  
study varied with town and village and the gender, which  
might be due to differences in the degree of exposure to the  
infection as influenced by the frequency of *Simulium* bites,  
and the duration and intensity of such bites (Hay, 1989;  
Edugbola *et al.*, 1987; Ukoli, 1984).

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