Table 1. Prevalence and intensities of urinary schistosomiasis among inhabitants examined at Ikao Village

	Population Examined		Intensity			
			Light Infection (<50 ova/10 ml)		Heavy Infection (≧50 ova/10 ml)	
	Male	Female	Male No (%)	Female No (%)	Male No (%)	Female No (%)
Occupation						
School children	236	204	44(18.6)	28(13.7)	22(9.3)	8(3.9)
Farmers and Petty Traders (Adult)	178	212	26(14.6)	26(12.3)	12(6.7)	12(5.7)
Total	414	416	70(16.9)	54(13.0)	34(8.2)	20(4.8)
Grand total	830		124(14.9)		54(6.5)	
			178(21.4%)			

Table 2. Prevalence of urinary symptoms in *S. haematobium* infected inhabitants

	Light infection No (%)	Heavy infection No (%)	Sensitivity No (%)
Urinary symptoms haematuria	98(79.0)	36(66.7)	134(75.3)
Dysuria	35(56.5)	30(55.6)	65(36.5)
Supra-pubic pain/discomfort	46(37.1)	16(29.6)	62(34.8)

excrete cerceriae. The villagers visit this stream for their water supply and recreational activities, thus exposing themselves to their main route of infection with *S. haematobium*.

This study commenced by mobilizing the villagers and educating them on the relevance of this study. After this community mobilization campaign, 830 volunteers were subjected to further parasitological investigations. The information on their sex, occupation, and genito-urinary symptoms such as dysuria, supra pubic/discomfort were obtained by a pre-designed questionnaire.

The mid stream urine were collected from the volunteers between 11.00 and 13.00 GMT with a wide-mouthed screw-capped 50 ml size container. These bottles were immediately transported to the parasitological laboratory of the Zoology Department, Ambrose Alli University, Ekpoma, for further procession. The processed urine was screened for the ova of *S. haematobium*. The ova were counted. The intensity of infection using the ova count was classified according to the method described by[12] as follows: light infection accounting for < 50 ova/ 10 ml of urine, and heavy infection for $\geqq 50$ ova/ 10 ml of urine. Haematuria were recorded visually and using Haemastik (Bayer) reagents strips.

Wet preparations of the high vaginal swabs collected from 222 female volunteers, especially those who complained of itching and abnormal vaginal discharge, were made and examined microscopically for the presence of *T. vaginalis*.

RESULTS

The prevalence and intensities of *S. haematobium* among the occupational groups of the inhabitants investigated are presented. One hundred and seventy-eight (21.4%) of the entire 830 villagers examined excreted *S. haematobium* ova in their urine. The male school children had more infections than the farmers and petty traders. Also, the males had both higher light infection (16.9%) and heavy infection rates (8.2%) than their female counterparts, who showed (13.0%) and (4.8%) respectively. This pattern of infection was statistically significant $X^2 = 4.83$; df $= 3$; $P < 0.05$. Generally, more inhabitants 124 (14.9%) had light infections as manifested by the presence of less than 50 eggs per 10 ml of urine (Table 1).

The pattern of the urine symptoms found among *S. haematobium* infected inhabitants are shown in Table 2. The sensitivity of haematuria (75.3%) was higher

Table 3. Prevalence of *T. vaginalis* infection according to age group

Age group	Total individuals Examined	Infected population
16-20	62	2(3.2)
21-25	40	16(40.0)
26-30	34	6(17.6)
31-35	20	0
> 36	68	0
Total	224	24(10.7)

than dysuria (36.5%) and supra pubic pain/discomfort (34.8%). All individuals with these urinary symptoms excreted *S. haematobium* ova in their urine. The urinary symptoms were not observed among inhabitants without urinary schistosomiasis.

Twenty-four (10.7%) female volunteers harboured *T. vaginalis* in their genital tract. Of these, 14 females had both *S. haematobium* and *T. vaginalis* infections. Ten inhabitants had trichomoniasis without urinary schistosomiasis. The highest infection rate 16 (40.0%) was observed among female inhabitants in the 20-25 year age group (Table 3).

DISCUSSION

The presence of *S. haematobium* ova in the urine of one hundred and seventy eight (21.4%) inhabitants depicts the hypoendemicity of an infection. This area falls into the category considered to be with moderate transmission[13]. This study collaborates earlier investigations made by[14] in Ibadan, Nigeria and[15] in Sokoto, Nigeria. Also, the present investigation agrees with the reports by earlier workers[16,17,18] that male school children show higher egg excretion than their female counterparts. This pattern of infection can be attributed to exposure factors because the absence of portable drinking water compels these children—especially males—to visit the infected stream for their water supply. This reason as well as the visit to this infected stream for recreation especially after farm activities are responsible for the males having more light and heavy infections than their female counterparts. This implies more water contact, and the net effect is more infections. The social factors arising from the appearance of secondary sexual characteristics often create some restrictions on their female counterparts from visiting the stream as regularly as the males. Exposure factors as well as the high acquired immunity could be advanced for this propensity of infection towards the children rather than the adults, who are predominantly farmers and petty traders.

Halt et al.[19] earlier indicated that uropathy is significantly associated with egg counts and haematuria at individual levels. Also, haematuria is frequently associated with *S. haematobium* infections[20-24]. Therefore, haematuria is regarded as a good marker for the morbidity of urinary schistosomiasis in any community. This assertion is further proved valid by the observation made in this present study where haematuria had the highest sensitivity rate of 75.0% when compared with other urinary symptoms, namely dysuria and supra pubic pain/discomfort with relatively lower sensitivity values. Therefore, it implies that these urinary symptoms which have been documented earlier[3,5] may not be very good indicators of urinary schistosomiasis when compared with haematuria at the community level in Ikao, Nigeria. It is worth mentioning that such urinary symptoms as the dysuria, haematuria, suprapubic pain recorded in this study are also implicated in other urinary tract infections caused by microbes like Escherichia coli, Klebsiella, staphylococci, Neisseria gonorrhoeae e.t.c. Chills, fever, costovertebral tenderness, nocturia, arthralgia and myalgia are involved. An interesting distinction between urinary schistosomiasis and urinary tract infections is that symptoms of urinary tract infections are often vague, infrequent, and inconsistent[25] and there are usually no *S. haematobium* ova in the urine. However, strong epidemiological significance is evidenced by the presence of *S. haematobium* ova in the urine of individuals with these urinary symptoms in this present study. Also, the absence of these urinary symptoms among individuals without urinary schistosomiasis can no doubt support the fact that persistent dysuria, haematuria, and supra pubic pain/discomfort are associated with urinary schistosomiasis in the rural settlement investigated.

The occurrence of *T. vaginalis* among individuals in a schistosomiasis infected zone and in a rural settlement where health education is scanty and ignorance prevails should be a public health concern despite the low level of the endemicities of these infections. Also, the occurrence of highest *T.*

vaginalis infections among female inhabitants between 20-25 years of age, a sexually active age group, indicates that this is the age group at risk in the community.[26] In this communication, we have reported for the first time on the occurrence of urinary schistosomiasis in this rural community in Nigeria. The association of this infection and trichomoniasis is now known to exist in this locality. Although the rate of these genito-urinary parasitic infections appears low, the results of this type of study are of immense public health importance for several reasons. Firstly, low infection rates are often very difficult to detect and may therefore be very important in the maintenance and propagation of these communicable infections in a rural communities[20]. Secondly, this study has potential to contribute to planning control programmes against these infections, programmes which can be achieved through proper and swift treatment of the inhabitants, health education especially through the practise of safe sex by use of condoms in *T. vaginalis*, and the provision of adequate and portable water supplies for urinary schistosomiasis. Having implicated a co-infection of these genito-parasitic infections, it is imperative to incorporate control of *T. vaginalis* into urinary schistosomiasis control, especially for the health benefits of the rural inhabitants.

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