American Journal of Science, Engineering and Technology
2022; 7(2): 44-49
http://www.sciencepublishinggroup.com/j/ajset
doi: 10.11648/j.ajset.20220702.13
ISSN: 2578-8345 (Print); ISSN: 2578-8353 (Online)

Female Genital Schistosomiasis and Clinical Manifestation in Selected Communities in Gwagwalada and AMAC, Abuja, Nigeria

Esther Bature[1], Ishaya Kato Auta[1], Basira Ibrahim[1], Isaac Ishaya Auta[2]

[1]Department of Biological Science, Kaduna State University, Kaduna, Nigeria

[2]Department of Microbiology, Nasarawa State University, Keffi, Nigeria

Email address:

ishayakato@yahoo.com (I. K. Auta)

To cite this article:

Esther Bature, Ishaya Kato Auta, Basira Ibrahim, Isaac Ishaya Auta. Female Genital Schistosomiasis and Clinical Manifestation in Selected Communities in Gwagwalada and AMAC, Abuja, Nigeria. *American Journal of Science, Engineering and Technology*. Vol. 7, No. 2, 2022, pp. 44-49. doi: 10.11648/j.ajset.20220702.13

Received: February 11, 2022; **Accepted**: March 1, 2022; **Published**: May 24, 2022

Abstract: Female Genital schistosomiasis [FGS] is a neglected and disabling disease that results when eggs from the waterborne parasite *Schistosoma haematobium* are trapped in the human reproductive tract. There is no specific action plan to address FGS due to epidemiological and clinical surveillance gaps. There is also insufficient data on FGS especially in northern Nigeria. This study sought to provide data on FGS in selected communities in Gwagwalada and AMAC area councils of FCT. The study recruited 154 women of reproductive age between [14-50 years]. Urine samples were collected from all 154 participants and subjected to a dipstick test to determine presence of haematuria, 44 [28.9%] tested positive for dipstick and was subjected to microscopy to examine the presence of Schistosoma ova. A total of 13 [8.6%] had egg-patent urogenital schistosomiasis. To verify presence of FGS directly, 6 adult women each underwent a gynaecological investigation with observed lesions as classified by the WHO FGS pocket atlas. All 6 [3.9%] presented with FGS symptoms as follows: abnormal blood vessels 31.3%, rubberey papules 25.0%, yellow grainy sandy patch 12.5% and contact bleeding at 6.3%. This study confirms FGS in FCT and calls for further investigation of this disease where urogenital schistosomiasis is endemic. There should be a specific action plan on FGS to help detect it, thereby providing data and also develop appropriate response to prevent it.

Keywords: Female, Genital, Schistosomiasis, Clinical, Manifestation, Reproductive Age, Communities

1. Introduction

Schistosomiasis is one of several Neglected Tropical Diseases (NTDs) considered major public health problems that affect tropical and sub-tropical countries such as Nigeria, Ghana, and Cameroon [1].

The disease is endemic in 75 countries, with over 200 million people affected and about 85% of these cases occurring in Africa [2]. In sub-Saharan Africa (SSA) there are two forms of schistosomiasis, intestinal and urogenital, each associated with different schistosome species [3]. The most pervasive form, urogenital schistosomiasis, is caused by Schistosoma haematobium and is predominant in Africa, Middle East and Corsica [4].

Female Genital Schistosomiasis (FGS) is a common complication of schistosomiasis caused by the presence of eggs in genital tissues. It is a manifestation mainly of Schistosoma haematobium infection. FGS is caused by the terminal-spine parasite eggs released from the female Schistosoma haematobium parasite. When the eggs are deposited in the tissues of the cervix and lower female genital tract, the presence of the eggs, combined with host inflammation and increased vascularity in the cervicovaginal mucosa, produces typical intravaginal lesions that result in genital itching and pain, bleeding, and dyspareunia [5].

FGS remains highly prevalent and under-diagnosed due to a low index of suspicion among health-care professionals. [6, 7].

The aim of this survey is to generate data on the prevalence of FGS in endemic communities within Gwagwalada and AMAC area councils FCT, Abuja.

2. Materials and Methods

2.1. Study Area

Gwako is a community in Gwagwalada Area Council in the Federal Capital Territory, Abuja with Longitude: 7:10829, Latitude: 8:96418. It has a population of about 50,000 persons with a third being under the age of five years old. Despite proximity to the Nigerian Capital City Abuja, Gwako has very poor water, sanitation, and hygiene conditions, including very poor access to clean water. Gwagwa is a peri-urban settlement in AMAC Area Council within the FCT with Latitude: N 9.5.17 and Longitude: E 7.19.0. It has a population of about 129,519 with one-third of it being children. The residents of this community are mostly low-income earners, artisans and farmers. A stream [Usuman River] runs adjacent to the settlement and is the major source for water for their recreational and domestic use. The community is also characterized by poor sanitary facilities. [8, 9].

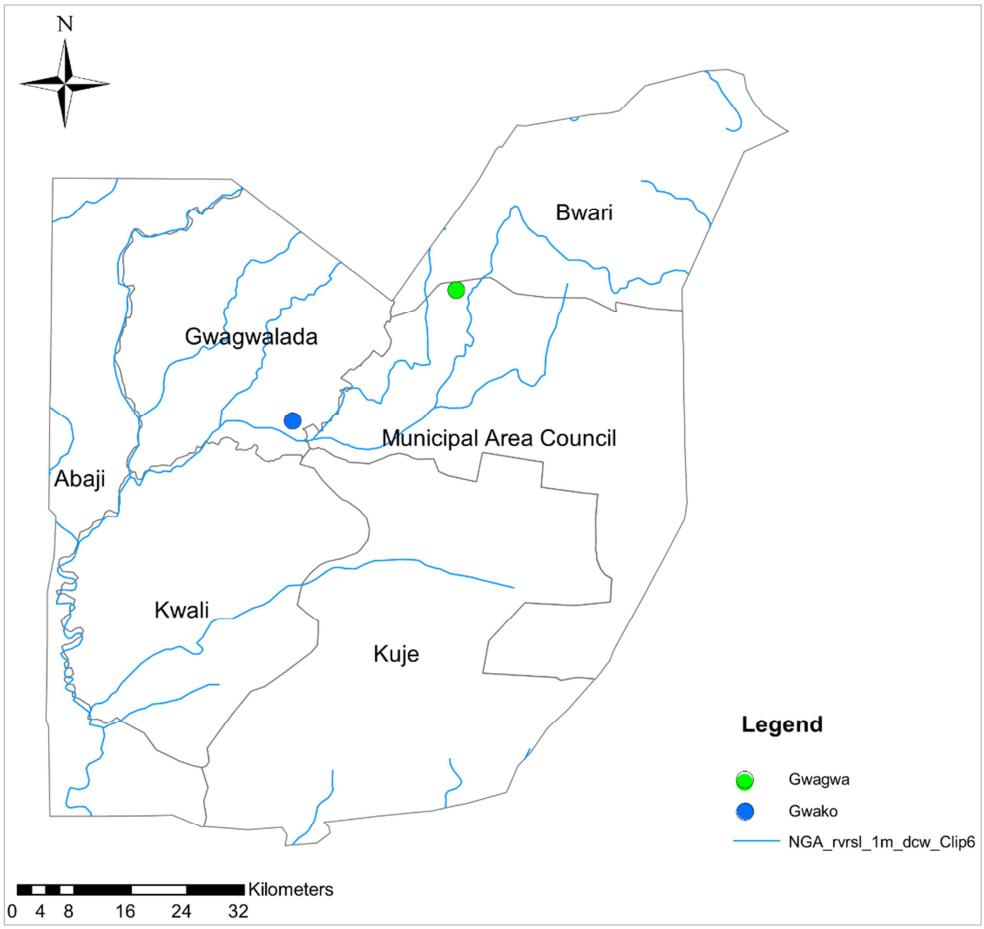

Figure 1. *Map of FCT Abuja showing Gwako and Gwagwa communities [Source: www.ArcGIS.com].*

2.2. Ethical Approval

Ethical approval was obtained from the ethical review board of the FCTA. Approval Number: FHREC/2021/01/122/20-10-21.

Community mobilization was be done through the community leaders and mobilizers.

2.3. Participants Interview and Questionnaire

Participant interview was conducted on site by the field team. Consent was obtained from all participants and guardians. A questionnaire was used to obtain information on socio-demographic characteristics, and each participant was asked to describe any urogenital signs and symptoms they were experiencing currently or recently.

2.4. Diagnosis of Urogenital Schistosomiasis

Urine samples were collected from each participant during late morning or early afternoon. Sample collection was done between 9am and 1pm. Each participant was given a capped sterile urine sample bottle. The Urine samples collected was first tested with dipstick to check for heamaturia. All the samples that tested positive for haematuria were preserved with 10% formaldehyde and transported to the FCT public health laboratory chilled on icepacks for light microscopy. Dipstick negative samples do not need to be subjected to urine filtration, as the probability of infection is very low if the dipstick result is negative [10]. 10ml of urine sample was collected using a syringe, the sample was then passed through a nucleprone filter which was then examined for *S.*

haematobium ova at ×10 magnification. The numbers of eggs per 10ml of urine were counted and recorded.

2.5. Clinical Examination

Clinical examination for FGS was done by a female gynecologist for consenting participants whose urine tested positive for both dipstick and microscopy. The examination commenced by the gynecologist informing the participants of what will be done and obtaining their consent.

The vagina was swabbed with cotton wool dipped in a diluted solution of savlon. A disposable speculum was used for participants who were sexually active and signs of FGS was recorded. Pictures were taken using a high-resolution camera phone.

The results were analysed using Chi-Square at 90% confidence interval using SPSS version 22.0.

A total of 151 samples were collected and analysed.

3. Results

The Demographic Characteristics of Participants with Haematuria Dipstick positive revealed 28% for age group while 29% for both educational and marital status in Selected Communities. The prevalence of the dipstick test was highest amongst ages 30-39 (8%) with the lowest being ages 20-29 [3%] [Table 1].

Table 1. *The Demographic Characteristics of Participants with Haematuria Dipstick positive in Selected Communities of Gwagwalada and AMAC, FCT Abuja, Nigeria.*

Variables		AMAC area council	Gwagwalada area council	
		Gwagwa Community	Gwako II Community	Total
		n=96 [38%]	n=55 [13%]	N=151 [28%]
Age group	14 - 19	11 (11)	0 (0)	11 (7)
	20 - 29	4 (4)	1 (2)	5 (3)
	30 - 39	9 (9)	3 (5)	12 (8)
	40 - 49	5 (5)	2 (4)	7 (5)
	50+	7 (7)	1 (2)	8 (5)
Education status	Informal	7 (7)	3 (5)	10 (7)
	Primary	8 (7)	1 (2)	9 (6)
	Secondary	10 (10)	2 (4)	12 (8)
	Tertiary	0 (0)	0 (0)	0 (0)
	None	11 (11)	1 (2)	12 (8)
Marital status	Single	12 (13)	1 (2)	13 (9)
	Married	21 (22)	5 (9)	26 (17)
	Separated	0 (0)	1 (2)	1 (1)
	Divorced	3 (3)	0 (0)	3 (2)

The age group with the highest numbers of schistosome eggs in the urine is ages 14 -19 [19%] while the group with the lowest schistosome eggs is 40-49 [2%]. This can be attributed to the fact that girls within the age of 14-19 are more likely to go to the river for recreation, domestic chores like washing and fetching of water which exposes them to the source of infection [Table]).

Table 2. *The Demographic characteristics of participants with microscopy positive and schistosome eggs per 10ml of urine in selected communities of Gwagwalada and AMAC, FCT Abuja.*

Variables		AMAC area council	Gwagwalada area council	
		Gwagwa Community	Gwako II Community	Total
		n=36 [%]	n=7 [%]	N=43 [%]
Age group	14 – 19	8 (22)	0	8 (19)
	20 – 29	2 (6)	0	2 (5)
	30 – 39	2 (6)	0	2 (5)
	40 – 49	1 (3)	0	1 (2)
	50+	0 (0)	0	0 (0)
Education status	Informal	1 (3)	0	1 (2)
	Primary	5 (14)	0	5 (12)
	Secondary	4 (11)	0	4 (9)
	Tertiary	0 (0)	0	0 (0)
	Blank	3 (8)	0	3 (7)
Marital status	Single	8 (22)	0	8 (19)
	Married	5 (14)	0	5 (12)
	Separated	0 (0)	0	0 (0)
	Divorced	0 (0)	0	0 (0)

The demographic characteristic of Female participants with Genital Schistosomiasis symptoms in selected communities revealed varied types of symptoms ranging from discharge, itching, offensive odour etc. [Tables 3 & 4].

Table 3. *Demographic characteristic of Female participants with Genital Schistosomiasis symptoms in selected communities of Gwagwalada and AMAC, FCT Abuja, Nigeria.*

Variables		AMAC area council	Gwagwalada area council	
		Gwagwa Community	Gwako II Community	Total
		n=6 [%]	n=0 [%]	N=6 [%]
Age group	14 – 19	1	0	1
	20 – 29	2	0	2
	30 – 39	2	0	2
	40 – 49	1	0	1
	50+	0	0	0
Education status	Informal	1	0	1
	Primary	1	0	5
	Secondary	2	0	4
	Tertiary	0	0	0
	Blank	2	0	3
Marital status	Single	1	0	1
	Married	5	0	5
	Separated	0	0	0
	Divorced	0	0	0

Table 4. *The total FGS pathology amongst women screened in selected communities of Gwagwalada and AMAC, FCT, Abuja, Nigeria.*

s/n	Status of urogenital schistosomiasis amongst women screened	Number of eggs	Age	Marital Status	itching	Burning sensation within private part	Any vagina discharge	Bad/Offensive smell
1	Positive	0 – 10	30 – 39	Married	No	No	No	No
2	Positive	0 – 10	50+	Separated	No	No	No	No
3	Positive	0 – 10	40 – 49	Married	Yes	No	No	No
4	Positive	0 – 10	30 – 39	Married	No	No	Yes	Yes
5	Positive	0 – 10	20 – 29	Married	Yes	Yes	No	No
6	Positive	0 – 10	30 – 39	Married	Yes	Yes	Yes	No
7	Positive	0 – 10	30 – 39	Single	No	No	No	No
8	Positive	0 – 10	40 – 49	Married	No	No	No	No
9	Positive	0 – 10	14 – 19	Single	No	No	No	No
10	Positive	0 – 10	20 – 29	Married	No	Yes	Yes	No
11	Positive	11 – 20	14 – 19	Single	Yes	No	Yes	No
12	Positive	11 – 20	14 – 19	Single	Yes	No	Yes	No
13	Positive	11 – 20	20 – 29	Married	Yes	No	Yes	No
14	Positive	21 – 40	14 – 19	Single	No	No	No	No
15	Positive	0 – 10	14 – 19	Single	Yes	No	Yes	No
16	Positive	21 – 40	14 – 19	Single	Yes	No	Yes	Yes
17	Positive	21 – 40	40 – 49	Married	No	No	No	No
18	Positive	40+	14 – 19	Single	No	No	No	No
19	Positive	0 – 10	14 – 19	Single	No	No	No	No
20	Positive	0 – 10	30 – 39	Married	No	No	No	No

Table 4. *Continue.*

s/n	Swelling or Lumps in private part	Blood in urine	FGS	Cervical Lesion	Yellow Grainy Sandy Patch	Abnormal blood vessels	Rubbery Papules	Contact bleeding	Yellow discharge
1	No	No	Yes	Yes	No	No	Yes	No	No
2	No	No	No	No	No	No	No	No	No
3	No	No	No	No	No	No	No	No	No
4	No	No	No	No	No	No	No	No	No
5	No	No	No	No	No	No	No	No	No
6	No	No	No	No	No	No	No	No	No
7	No	No	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No	No	No
9	No	Yes	Not Sexually Active	No	No	No	No	No	No
10	No	No	Yes	No	No	Yes	Yes	No	No
11	No	No	Not Sexually Active	No	No	No	No	No	No
12	No	Yes	Not Sexually Active	No	No	No	No	No	No
13	No	No	Yes	Yes	Yes	Yes	Yes	No	No
14	No	No	Not Sexually Active	No	No	No	No	No	No
15	No	No	Yes	No	No	Yes	No	No	Yes
16	No	No	Not Sexually Active	No	No	No	No	No	No
17	No	No	Yes	No	No	Yes	No	No	No
18	No	No	Not Sexually Active	No	No	No	No	No	No
19	No	No	Not Sexually Active	No	No	No	No	No	No

s/n	Swelling or Lumps in private part	Blood in urine	FGS	Cervical Lesion	Yellow Grainy Sandy Patch	Abnormal blood vessels	Rubbery Papules	Contact bleeding	Yellow discharge
20	No	No	Yes	No	Yes	Yes	Yes	No	Yes

4. Discussion

The microscopy test shows that the age group with the highest numbers of Schistosoma eggs in their urine is within the age range of 14 -19 [19%] while the age group with the lowest number of eggs is 40 -49 [2%]. This can be attributed to the fact that ages 14-19 are very active and are more likely to go swimming in the river, washing clothes or fetching water for the household. Thus, they are exposed to the source of infection. Although it has been reported by the Cameroonian study that FGS is more prevalent among younger women [ages 15-30], this study observed the highest prevalence amongst women ages 31- 40 with a prevalence of 7.7%. In respect to water contact, those whose water source include river, which is the major route of infection, had the highest prevalence of 9.0%. This is similar to the findings of [11].

With respect to educational qualifications, there is a high prevalence among those with primary education and low amongst those with secondary and tertiary education. The low prevalence amongst those with secondary and higher education could be attributed to better hygiene practices as a result of higher knowledge.

Of all the 13 participants that were eligible for the clinical check, 7 of them were not sexually active and as such could not be examined due to ethical reasons. However, all 6 of the sexually active women, who accepted to undergo the clinical check for FGS had clinical manifestations of FGS with the presence of abnormal blood vessels in the genitals 5 [31.3%], followed by presence rubbery papules 4 [25.0], next was presence of cervical lesion, yellow grainy, sandy patches, yellowish discharge all at 2 [12.5%] respectively, the least encountered clinical finding was contact bleeding 1 [6.3%].

Images from the clinical check were cross verified with the WHO FGS pocket Atlas as reference [6]. The cross-cutting symptoms were itching in the vagina and discharge. It is remarkable that such a locally pervasive disease, which is of obvious detriment to the health of women has not attracted more attention, although like elsewhere in Nigeria many perhaps suffer in silence [12]. More broadly, clinical surveillance of FGS in West Africa has not been undertaken largely due to lack of awareness and inexperience of health personnel at all cadres [13, 14].

5. Conclusion

This study has confirmed the occurrence of FGS in Abuja FCT, Nigeria and highlights that a substantive proportion of women with urogenital schistosomiasis have underlying gynecological disease that is currently overlooked and unknown by the women. With a prevalence of 3.9% in 2 selected communities, it shows that with further research, more cases will be identified.

Acknowledgements

We are grateful to the study participants who generously gave their time to be involved in this study. We thank Dr Amba Ekure for carrying out the gynecological checks for FGS.

References

[1] Anyanti J, Akuiyibo S, Onuoha O, Nwokolo E, Atagame K, et al. (2021): Addressing Schistosomiasis in a Community in Nigeria: A Theoretical Approach. Int J Trop Dis 4: 044. doi.org/10.23937/2643-461X/1710044.

[2] Steinmann, P., Keiser, J., Bos, R., Tanner, M. and Utzinger, J. (2006). Schistosomiasis and water resources development: systematic review, meta-analysis, and estimates of people at risk. *Lancet Infectious Diseases* 6, 411–425. CrossRef Google ScholarPubMed.

[3] Colley, D. G., Bustinduy, A. L., Secor, E. and King, C. H. (2014). Human schistosomiasis. Lancet 383, 2253–2264. CrossRefGoogle ScholarPubMed WHO (2016). Schistosomiasis and soil-transmitted helminthiases: number of people treated in 2015. Weekly Epidemiological Record 91, 585–600. Google.

[4] WHO (2016). Schistosomiasis and soil-transmitted helminthiases: number of people treated in 2015. Weekly Epidemiological Record 91, 585–600. Google ScholarPubMed.

[5] Kjetland E. F, Hegertun IE, Baay MF, Onsrud M, Ndhlovu PD, Taylor M (2014) Genital schistosomiasis and its unacknowledged role on HIV transmission in the STD intervention studies. Int J STD AIDS. 2014 Sep; 25 (10): 705–15. https://doi.org/10.1177/0956462414523743 PMID: 2462145.

[6] WHO [2015]. Female Genital Schistosomiasis: A Pocket Atlas for Clinical Health Professionals, p. 49. WHO, Geneva. ISBN: 9789241509299. Google Scholar.

[7] Ekpo UF, Laja-Deile A, Oluwole AS, Sam-Wobo SO, Mafiana CF (2010): Urinary schistosomiasis among preschool children in a rural community near Abeokuta, Nigeria. Parasite Vectors 3: 58.

[8] Ifeanyi CIC, Matur BM, Ikeneche NF (2009): Urinary schistosomiasis and Concomitant bacteriuria in the Federal Capital Territory Abuja Nigeria. NewYork Science Journal 2: 1-8.

[9] Lar, P. M, Emojevwe, M. and Onah, J. A [2006]. Incidence of mixed infections of Schistosoma and Salmonella in the Federal Capital Territory, Abuja. African Journal of Natural Sciences. 2006 ISSN 1119 -1104 Patton MQ. Qualitative research and evaluation methods. 3rd Sage Publications; Thousand Oaks, CA: 2002.

[10] Robinson Emily, Diana Picon, Hugh J Sturrock, Anthony Sabasio, MounirLado, Jan Kolaczinski and Simon Brooker [2009]. The performance of haematuria reagent strips for the rapid mapping of urinary schistosomiasis: field experience from Southern Sudan. Trop Med Int Health. 2009 December; 14 (12): 1484–1487.

[11] Ekpo, U. F., Odeyemi, O. M., Sam-wobo, S. O., Onunkwor, O. B., Mogaji, H. O., Oluwole, A. S., Abdussalam, H. O., Stothard, J. R. [2017] Female genital schistosomiasis (FGS) in Ogun State, Nigeria: a pilot survey on genital symptoms and clinical findings. Parasitology Open (2017), Vol. 3, e10; page 1 of 9. © Cambridge University Press 2017. 10.1017 https://www.cambridge.org/cor/pao.2017.11e

[12] Dawaki, S., Al-Mekhlafi, H. M., Ithoi, I., Ibrahim, J., Abdulsalam, A. M., Ahmed, A., Sady, H., Nasr, N. A. and Atroosh, W. M. (2015). The menace of schistosomiasis in Nigeria: knowledge, attitude, and practices regarding schistosomiasis among rural communities in Kano State. PLoS ONE 10. doi: 10.1371/journal.pone.0143667.

[13] Christinet, V., Lazdins-Helds, J. K., Stothard, J. R. and ReinhardRupp, J. (2016). Female genital schistosomiasis (FGS): from case reports to a call for concerted action against this neglected gynaecological disease. International Journal for Parasitology 46, 395–404.

[14] Holmen, S. D., Onsrud, M., Vennervald, B. J., Albregtsen, F., Taylor, M., Moodley, J., van Lieshout, L., Pillay, P., Lillebo, K., Kleppa, E. and Kjetland, E. F. (2014). Diagnosing female genital schistosomiasis. International Journal of Infectious Diseases 21, 169.