International Journal of Medical Science and Clinical Research Studies

ISSN (print): 2767-8326, ISSN (online): 2767-8342

Volume 04 Issue 12 December 2024

Page No: 2377-2380

DOI: https://doi.org/10.47191/ijmscrs/v4-i12-46, Impact Factor: 7.949

Socio-Economic Indicators and Prevalence of Urinary Schistosomiasis among Primary School Pupils in Ndokwa-East Lga of Delta State, Nigeria

Mbagwu Nkemjika E[1], Ajaegbu Obinna C[1], Opara Hyginus I O[1], Ibezim Stella I[3], Okwudinka Ifeoma O[1], Ezeonwu Bertilla U[1], Okolo Selina N[2]

[1]Department of Paediatrics, Federal Medical Centre, Asaba, Delta state, Nigeria.

[2]Department of Paediatrics, Jos University Teaching Hospital, Jos, Plateau State, Nigeria.

[3]Catholic Caritas Foundation of Nigeria, Asaba, Delta State, Nigeria.

ABSTRACT

Background: Schistosomiasis is a water-borne tropical parasitic disease that is of a major public health problem. It is one of the neglected tropical diseases that are prevalent in the developing nations with poor health resources, especially sub-Saharan Africa and Nigeria in particular.

Objective: The aim of the study was to determine the relationship between the socio-economic indicators and prevalenceof urinary schistosomiasis among primary school children in Ndokwa East Local Government Area of Delta State, Nigeria.

Methods: This study was a cross sectional descriptive study of primary school children aged 5-15 years in Ndokwa-East Local Government Area (NELGA) of Delta State, Nigeria. Information on the socio-demographic characteristics of the pupils and their caregivers were obtained using questionnaire administered to the pupils. Urine microscopy (centrifugation method) was done for the pupils and the schistosoma eggs were counted and graded according to WHO standards. Relationship between the socio-economic indicators and the infection prevalence were tested using chi-square analysis and Fisher's exact test where indicated.

Results: A total of 374 pupils were studied. Twenty-eight (7.5%) of them had urinary schistosomiasis; mother's occupation (FET, df = 4, p-value = 0.014), and lower socio-economic status of the caregivers (FET, df = 2, p-value = 0.031), were significantly associated with schistosomiasis infection.

Conclusion: In conclusion, socio-economic factors affect the prevalence of urinary schistosomiasis among primary school pupils in Delta State, Nigeria

KEYWORDS: Urinary schistosomiasis, prevalence, Socio-economic factors.

ARTICLE DETAILS

Published On:
21 December 2024

Available on:
https://ijmscr.org/

INTRODUCTION

Schistosomiasis is a water-borne tropical parasitic disease caused by one or more of the species of schistosoma blood flukes.[1] *S. haematobium* is responsible for urogenital schistosomiasis. The World Health Organization (WHO) has designated schistosomiasis as a neglected tropical disease mainly because of the low political drive to tackle the disease, as well as the low socio-economic class of the people mainly affected by it.[2,3] Schistosomiasis is endemic in some localities across Nigeria and one of those localities is Ndokwa-East Local Government Area (NELGA) of Delta State,[4,5,6] Some occupations like fishing and farming have been said to be risk factors for the infection as the individuals with such occupations tend to utilize the infested water bodies for bathing and washing their agricultural produce, predisposing them to infection.[7,8,9,10] Poor socio-economic factors may also be a factor propagating the infection as such compels individuals to utilize contaminated water sources for domestic activities, exposing them to the infection. There is paucity of data on the effect of socio-economic factors on the prevalence of schistosomiasis in NELGA of Delta State and Nigeria.

The aim of this study is to study the socio-economic indicators and prevalence of urinary schistosomiasis among primary school pupils in NELGA of Delta State, Nigeria.

SUBJECTS AND METHODS

Ndokw-East Local Government Area of Delta state is bounded in the East by River Niger and West by the Ase Creek, in addition to many lakes and streams in the LGA.[11] The climate is tropical; with an average rainfall of about 266.5 mm and an average temperature of about 30°C.[11] The two main seasons in this area include the rainy season (April to October) and the dry season (November to March). Fishing and subsistence farming are the major occupations in the LGA.

This was a cross sectional, descriptive study of primary school children aged between 5 and 15 years, drawn from NELGA of Delta State. Subjects were grouped into age cohorts' 5-7 years, 8-10 years, 11-13 years, and 14 – 15 years, as of their last birthday. Subjects' recruitment was by multistage, stratified sampling method. The wards and the primary schools were selected by simple random sampling method at the first and second stage. Basic demographic characteristicssuch as age, sex, community, parents' occupation and level of education were obtained using study questionnaire. The socio-economic classes of the parents were determined using Olusanya's classification scheme.

Twenty milliliters of clean-catch, midstream/terminal urine samples were collected from the selected pupils, samples were obtained between 10am and 2pm of the day (time of maximum egg excretion)[12] and they were transported to the laboratory at FMC Asaba for analysis. Delay in the transportation of the specimens to the laboratory (more than 2hours in room temperature) was inevitable because of the distance, hence, 1-2 drops of ordinary household bleach (1% sodium hypochlorite) were added to the urine samples to preserve any schistosome ova present.[13] During the microscopy, eggs were recovered from urine by the standard centrifuge-sedimentation technique.[14] About 10mls of the urine collected from each subject was centrifuged at a speed of 2000 revolutions per minute for 5 minutes to sediment the residue, after which the supernatant were discarded and the sediment obtained with a pipetteand placed on a clean glass microscopic slide. A drop of 1% Lugol's Iodine was dropped on it, and covered with a glass coverslip for microscopic examination. Using the power 10 (10X) objective lens of light binocular microscope (OLYMPUS CH20i), the entire slide under the coverslip was examined for the ova of *S. haematobium*. The number of eggs were counted and the intensity of infection was determined using WHO standards; < 50 eggs/10 ml urine was considered as mild infection, while ≥ 50 eggs/10 ml of urine was considered as heavy infection.[15] The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 22. Socioeconomic indicators (such as occupation, level of education and socio-economic classes of caregivers) were treated as categorical variables and expressed using frequency tables and charts. Relationship between these categorical variables and infection prevalence were tested using chi-square analysis, and Fisher's exact test when indicated. Level of significance was set at a p-value of less than 0.05

Inclusion and exclusion criteria

All primary school children aged 5-15 years in selected communities whose parents gave consent were recruited for the study. Primary school children who has never been resident in NELGA in the last two months prior to this study were excluded from this study.

RESULTS

Table 1 shows the relationship between the socioeconomic indicators of the parents of subjects and educational status. A total of 374 primary school pupils were enrolled into the study. Majority of their parents were farmers (55.3%) and majority (62.3%) of them had primary level of education as their highest educational attainment. Majority (81.8%) of them belonged to the lower socio-economic class using Olusanya's socioeconomic classification scheme. The overall prevalence of urinary schistosomiasis among Primary school children in NELGA was 7.5%. Those whose fathers were farmers/fishermen, had the highest prevalence (9.8%/14.8%) compared to the civil servants/artisans/traders (0%/3.6%/6.3%). (FET, df = 5, p-value = 0.070) though not statistically significant. This is as shown in table I. Those whose mothers were farmers had the highest prevalence (11.6%) compared to others. This was significant (FET, df = 4, p-value = <0.05).

Table I: Relationship between some socioeconomic indicators of the parents of subjects and educational status.

Parameter		Infection status (n = 374)							
		Father				Mother			
		Infected n (%)	Not infected n (%)	χ^2	p-value	Infected n (%)	Not infected n (%)	χ^2	p-value
Occupation	**Farming**	20 (9.8)	185 (90.2)	FET	0.070	24 (11.6)	183 (88.4)	FET	**0.014***
	Fishing	4 (14.8)	23 (85.2)			-	-		
	Trading	3 (6.3)	45 (93.7)			2 (2.6)	76 (97.4)		
	Artisans	1 (3.6)	27 (96.4)			0 (0.0)	33 (100.0)		
	Civil servants	0 (0.0)	41 (100.0)			2 (6.5)	29 (93.5)		

	Others	0 (0.0)	25 (100.0)			0 (0.0)	25 (100.0)		
Highest Educational Attainment	**NFE**	5 (12.5)	35 (87.5)	FET	0.111	5 (12.2)	36 (87.8)	FET	0.221
	Primary	20 (8.6)	213 (91.4)			18 (7.9)	209 (92.1)		
	Secondary	3 (4.7)	61 (95.3)			5 (6.8)	68 (93.2)		
	Tertiary	0 (0.0)	37 (100.0)			0 (0.0)	33 (100.0)		

* = Significant p-value, NFE: No formal education, FET = Fisher's Exact Test

Table II shows the relationship between the socioeconomic classes of the parents of the subjects and infection status. The highest educational attainment of the parents/caregivers had inverse relationship with the prevalence of the infection. Pupils, whose parents/caregivers were within the lower socioeconomic classes, had more prevalence of infection (9.2%) compared to the pupils whose parents/caregivers, were within the higher/middle socioeconomic status (0%) (FET, df = 2, p-value = <0.05).

Table II: Relationship between the socioeconomic classes of the parents of the subjects and infection status

Socioeconomic class	Infection status (n=374)			
	Infected (%)	Not infected (%)	χ^2	p-value
Higher	0 (0.0)	27 (100.0)	FET	**0.031**
Middle	0 (0.0)	41 (100.0)		
Lower	28 (9.2)	278 (90.8)		

* = Significant p-value, FET = Fisher's Exact Test

DISCUSSION

The prevalence of urinary schistosomiasis among the subjects in this study was 7.5%. The observation that farming/fishing, as the occupation of the caregivers, were associated with higher prevalence compared to civil servants and artisans could be due to the fact that the caregivers were said to be taking their children to those infested water bodies regularly, exposing them to the infection. Ekwunife et al[7] at Delta State in 2009, Bello et al[9] at Sokoto state in 2014, and Dawaki et al[16] at Kano State in 2016; all reported the same higher prevalence of infection among farmers in their studies; while Ugbomoiko et al[8] at Osun State in 2010 reported higher prevalence among the fishermen/farmers.[7,8,9,16] The similarity stemmed from the fact that the occupation of those individuals, involve direct contact with water bodies, either to wash their farm produce, irrigate their farms, or catch fish, thereby exposing them to the infection. However, this index finding was slightly at variance to the study by Evans et al[17] in 2013, who documented no difference between group 1 (which had more business men and civil servants) and group 2 (that had more farmers and fishermen).[17] The observed difference may be due to the difference in the grouping of the subjects. It could also be due to difference in study population as they studied adults as subjects whereas this index study examined children.[17]

Higher literacy level of the caregivers was associated with lower prevalence of the infection among the subjects in this study. This finding is similar to what was documented by Ugbomoiko et al[8] at Osun State in 2010, and Sady et al[18] at Yemen in 2013 where they reported literacy level of the family head as a protective factor against the infection.[8,18] This may probably be multi-faceted; education affects attitudes and behavior in different ways.[8] The tendency to be exposed to the knowledge of prevention of water-borne diseases in general like water treatment and preference during the course of education, and hence modulation of their risky infection-predisposing behaviours; and the likelihood of imbibing in their children such practices are higher with higher literacy level. However, Reuben et al[19] in Nasarawa State, Nigeria in 2011, in contrast, reported highest prevalence of the infection among children whose parents had secondary and tertiary level of education, compared to those with primary or no formal level of education.[19] The reason for this may be due to the different socio-cultural backgrounds as pupils whose parents had primary/no formal level of education in index study were even less conserved than others, especially in water contact activities, unlike being more conserved than others, especially in water contact activities, reported in the latter study.[19]

CONCLUSION

The occupation, level of education, and other socio-economic indicators of the caregivers of primary school pupils affect the prevalence of urinary schistosomiasis in NELGA of Delta state, Nigeria.

ACKNOWLEDGMENT

We wish to acknowledge the research assistances who made this work a success. To the school authorities and parents we appreciate their assistance.

DECLARATION

Ethical Consideration

Ethical clearance was obtained from the Ethics Committee, FMC Asaba. Written permissions were obtained from the State Ministry of Basic and Secondary Education, and NELGA. Informed consent was obtained from the caregivers of the study participants and assents were obtained from the participants.

FINANCIAL SUPPORT AND SPONSORSHIP: none

CONFLICTS OF INTEREST: none

REFERENCES

I. WHO. First WHO report on neglected tropical diseases: working to overcome the global impact of neglected tropical diseases. World Heal Organ. 2010:1-184. doi:10.1177/1757913912449575

II. World Health Organization. Changing History. Geneva; 2004. WHO 2004.

III. World Health Organization. Schistosomiasis; Number of People Treated in 2011.; 2013. WklyEpidemiol Rec.

IV. Steinmann P, Keiser J, Bos R, Tanner M, Utzinger J. Schistosomiasis and water resources development: systematic review, meta-analysis, and estimates of people at risk. Lancet Infect Dis. 2006;6(7):411-425. doi:10.1016/S1473-3099(06)70521-7

V. Hotez PJ, Kamath A. Neglected tropical diseases in sub-saharan Africa: review of their prevalence, distribution, and disease burden. PLoS Negl Trop Dis.2009;3(8):e412. doi:10.1371/journal.pntd.0000412

VI. Nwabueze AA, Opara KN. Outbreak of urinary schistosomiasis among school children in riverine communities of Delta State, Nigeria: Impact of road and bridge construction. J Med Sci. 2007;7(4):572-578. doi:10.3923/jms.2007.572.578

VII. EkwunifeCA, Agbor VO, Ozumba AN, Eneanya CI Ukaga CN. Prevalence of urinary schistosomiasis in Iyede-Ame Community and environ in Ndokwa East Local Government Area , Delta State , Nigeria. Niger J Parasitol. 2009;30(January 2009):27-31.

VIII. Ugbomoiko US, Ofoezie IE, Okoye IC, Heukelbach J. Factors associated with urinary schistosomiasis in two peri-urban communities in south-western Nigeria. Ann Trop Med Parasitol. 2010;104(5):409-419. doi:10.1179/136485910X12743554760469

IX. Bello A, Jimoh AO, Shittu SB, Hudu SA. Prevalence of urinary schistosomiasis and associated haemato-proteinuria in Wurno Rural Area of Sokoto State, Nigeria. Orient J Med. 2014;26(3/4):114-121. http://www.ajol.info/index.php/ojm/article/view/108564.

X. WHO. Schistosomiasis Fact Sheets. In: ; 2014. http://www.who.int/mediacentre/factsheets/fs115/en.

XI. Brief History of Delta State:: Nigeria Information & Guide. https://www.nigeriagalleria.com/Nigeria/States_Nigeria/Delta/Brief-History-of-Delta-State.html.

XII. Schistosomiasis infection. https://www.cdc.gov/dpdx/schistosomiasis/dx.html.

XIII. Ogbonna CC, Dori GU, Nweze EI, Muoneke G, Nwankwo IE, Akputa N. Comparative analysis of urinary schistosomiasis among primary school children and rural farmers in Obollo-Eke, Enugu State, Nigeria: Implications for control. Asian Pac J Trop Med. 2012;5(10):796-802. doi:10.1016/S1995-7645(12)60146-1

XIV. Schistosomiasis.http://www.cdc.gov/parasites/schistosomiasis/disease.html.

XV. World Health Organization. Prevention and control of schistosomiasis and soil-transmitted helminthiasis. World Health Organ Tech Rep Ser. 2002;912:i-vi, 1-57, back cover. doi:0512-3054

XVI. Dawaki S, Al-Mekhlafi HM, Ithoi I, Ibrahim J, Abdulsalem AM, Ahmed A, Sady H, Atroosh WM, Al-Areeqi MA, Elyana FN, Nasr NA, Surin J. Prevalence and risk factors of schistosomiasis among Hausa communities in Kano state, Nigeria. Rev Inst Med Trop Sao Paulo. 2016;58:1-9. doi:10.1590/S1678-9946201658054

XVII. Evans DS, King JD, Eigege A, Umaru J, Adamani W, Alphonsus K. Assessing the WHO 50% prevalence threshold in school-aged children as indication for treatment of urogenital schistosomiasis in adults in Central Nigeria. Am J Trop Med Hyg. 2013;88(3):441-445. doi:10.4269/ajtmh.12-0511

XVIII. Sady H, Al-Mekhlafi HM, Mahdy MAK, Lim YAL, Mahmud R, Surin J. Prevalence and Associated Factors of Schistosomiasis among Children in Yemen: Implications for an Effective Control Programme. PLoS Negl Trop Dis. 2013;7(8):e2377. doi:10.1371/journal.pntd.0002377

XIX. Reuben RC, Tanimu H, Musa JA. Epidemiology of Urinary Schistosomiasis Among Secondary School Students in Lafia, Nasarawa State, Nigeria. J Biol Agric Healthc. 2011;3(2):73-82.