CUSTECH INTERNATIONAL JOURNAL OF EDUCATION, VOL.1, NO. 1, JULY, 2024
http://custechijoe.org.ng
ISSN 1595-1839

PATTERN OF OCCURRENCE OF HUMAN INTESTINAL GEOHELMINTHIASIS INFECTION IN TROPICAL COMMUNITIES' SCHOOLS OF ANAMBRA STATE NIGERIA

BY

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Abstract

Geogastrointestinal parasitic infections have remained a major public health problem in the developing countries over the years, with increasing and sustained risk factors including open defecation, poor personal and food hygiene, and poor environment sanitation. The major aim of this study is to assess the impact of water sanitation and hygiene intervention undertaken by EU and UNICEF to eliminate diseases associated with poor hygiene and water in Aguata Local Government Area, Anambra State, Nigeria. Informed consent was sought from the respondent's, structured questionnaire was administered and fecal specimens was collected from 650 individuals. Direct wet mount and formol ethylether concentration technique were used to analyze the fecal specimens. Out of the 650 examined 119(18.31%) were infected. The highest prevalence rate was recorded in Ascaris lumbricoides 27(4.15%), followed by Hookworm 11(1.69%), Trichuris trichiura 8(1.23%) and the least being Strongloides stercoralis 2(0.31%). Gastrointestinal helminthes infections not sex related as females 61(18.65%) were insignificantly infected more than the males 58(17.96%) (p>0.05).Age group 31 – 40 years recorded the highest prevalence 21(25.93%) followed by 11 – 20 years, 36(19.35%); > 40 years 11(18.97), 21 – 30 years 28(16.97) whereas 0 – 10 years recorded the least prevalence of 23 (14.38%). This study reveals that water sanitation and hygiene

intervention exerted a significant positive impact in view of the low overall prevalence recorded. Sustainability of this program with adequate funding by Town Unions, Anambra State and Federal Government is highly important.

Keywords: Water sanitation and hygiene, Gastrointestinal, Helminthes, prevalence, environmental sanitation, EU. UNI

Introduction

In developing countries, intestinal parasitism is a primary public fitness hassle that is frequently omitted. In these less developed countries, poor environmental and private hygiene, negative nutrition, overcrowding and climatic situations that prefer the development and survival of those parasites are some of the elements contributing to the high degree of intestinal parasites transmission (Egwunyenga *et al*., 2005, Obiukwu *et al.*, 2008). School kids bring the heaviest burden of the associated morbidity (Nematian, *et al.*, 2004), due to their dirty conduct of playing or dealing with of infested soils, eating with soiled palms, unhygienic rest room practices, ingesting and consuming of contaminated water and food (Nwosu, 1981).It's been envisioned that *Ascaris lumbricoides*, *Hookworm* and *Trichuris trichiura* infect 1,450 million, 1300 million and 1,050 million humans international, respectively, whilst Schistosomiasis influences over 200 million humans (WHO, 2002). Globally, two billion people had been infected with intestinal parasites; out of those majorities had been youngsters because of malnutrition (WHO, 2002). Particularly in Sub-Saharan Africa, it was stipulated that parasitic infections were the major public health problem.

Methodology

Aguata, with co-ordinates $7^0$10'0E and $5^0$10'0E, is the largest Local Government Area in Anambra State; with headquarters in Aguata (location of the headquarter office building part of which falls into the city of Ekwulobia while the other part falls within Aguluezechukwu Town). Aguata lies within the tropical rainforest belt of Nigeria and in the agricultural belt of Anambra State. Located in the Anambra South Senatorial Zone, Aguata is divided into Aguata North State Constituency and Aguata South State Constituency. Aguata covers approximately an area of 19,906.25km Aguata Town Planning Authority with a total population of 369,972 people constituting 187, 262 males and 182,710 females according to 2006 population census, (FRNOG, 2009). The study population were individuals of all ages randomly selected from six (6) towns declared open-defecation-free in Aguata LGA. A total of 650 individuals (323 males and 327 females) were selected and

examined using the Yaro Yamane's formular given by n = N/1+N(e^2) according to Uzoagulu, (2011) where n = the minimum sample size; N = The population size; e = level of significance or limit of tolerance (0.05); 1 = unity (a constant). The individuals were instructed on how to collect the fecal. Samples were labeled appropriately and then transported to the Laboratory parasitological examinations. Oral interview and structured questionnaire were administered to each individual respondent. Stool samples were collected into wide mouthed grease free and clean specimen containers and taken to the laboratory. Methods described by Cheesbrough (1998) and WHO (1991) were used for fecal processing, analysis, examination and identification of parasites.

Formol ethyl ether concentration technique as described by Cheesbrough (1998) was used. Data obtained were analyzed using statistical package for the social sciences-SPSS software version 25.0. Chi-square (χ^2) test and one way ANOVA were used to determine if there is any statistically significant difference between prevalence of parasites in the sex and the age of the individual at $p>0.05$ statistically significant level.

Result

Table 1

Prevalence of Gastro Intestinal Helminthes Parasites in Aguata L.G.A. in relation to Towns and Sex

Town	Number examined		Total	Number Positive (%)		Total (%)
	Male	Female		Male	Female	
Ekwulobia	78	72	150	11(14.10)	10(13.89)	21(14.00)
Ezinifite	36	44	80	8(22.22)	14(31.82)	22(27.50)
Igboukwu	52	48	100	15(28.35)	9(18.75)	24(24.00)
Uga	59	61	120	7(11.86)	9(14.75)	16(13.33)
Achina	58	62	120	8(13.79)	14(22.58)	22(18.33)
Amesi	40	40	80	9(22.50)	5(12.50)	14(17.50)
Total	323	327	650	58(17.96)	61(18.65)	119(18.31)

Table 2:
Prevalence and distribution of gastrointestinal Helminths Parasites in Aguata L.G.A. in relation to Sex

Sex	Number examined	Number Positive				
		Helminth Parasites (%)				Total
		AS	HW	TR	ST	
Female	327	12(3.67)	6(1.86)	5(1.53)	2(0.61)	26(7.95)
Male	323	15(4.64)	5(1.55)	3(0.93)	0(0.00)	22(6.81)
Total	650	27(4.15)	11(1.69)	8(1.23)	2(0.31)	48(7.38)

Key: AS = *Ascaris lumbricoides*; HW = Hookworm; TR = *Trichuris trichiura*; ST = *Strongyloides stercoralis*

Table 3:
Prevalence of gastrointestinal Helminthes parasites in Aguata LGA in relation to towns and age groups

Age group	Number Examined						Total	Number Positive (%)						Total
	EK	EZ	IG	UG	AC	AM		EK	EZ	IG	UG	AC	AM	
1-10	34	16	27	33	31	19	160	5(14.71)	5(31.25)	4(14.81)	3(9.09)	4(12.90)	2(10.53)	23(14.38)
11-20	42	23	31	35	32	23	186	6(14.29)	6(26.09)	11(35.43)	7(21.21)	4(12.90)	2(8.70)	36(19.35)
21-30	37	19	28	31	29	21	165	6(16.21)	4(21.05)	3(10.71)	5(16.13)	6(20.69)	4(19.05)	28(16.97)
31-40	20	15	9	12	9	16	81	3(15.00)	4(26.67)	5(55.56)	1(8.33)	4(25.00)	4(44.44)	21(25.93)
>40	17	7	5	9	8	12	58	1(5.88)	3(42.86)	1(20.00)	0(0.00)	4(33.33)	2(25.00)	11(18.97)

Total	150	80	100	120	120	80	650	21(14.00)	22(27.50)	24(24.00)	16(13.33)	22(18.33)	14(17.50)	119(18.31)

Key: EK = Ekwulobia; EZ = Ezinifite; IG = Igboukwu; UG = Uga; AC = Achina; AM = Am

Discussion

Gastrointestinal parasitic infections in man are important public health problem in the developing countries including Nigeria. The environment and socio-cultural habits or practices of the people may account for the high prevalence of intestinal parasitic infections in most developing countries (Mbanugo *et al*., 2002). This study revealed an overall prevalence of 18.31% as shown in (Table 1) far lower than recorded in previous studies which reported high prevalences: 49.7% (Emmy-Egbe *et al*., 2012); 30.6% (Mbanugo and Onyebuchi, 2002); 42.7% Michael *et al*., 2017). 48.7% in Imo State, (Udensi *et al*., 2015) 48.40% in South=Western Nigeria, Awolajie *et al*, 2009), 44.71% in Uga Aguata LGA (Chioma *et al*., 2015), 52.5% in Uzzo-Uwani Local Government Area of Enugu State, Odo *et al*., 2016). Such high prevalence has been attributed to ignorance, poverty, poor environmental sanitation, poor personal hygiene, shortage of clean portable water and indiscriminate defecation. In table 2 the females were infected (18.65%) more than the males (17.96%) and they did not significantly differ in the rate of infection ($p>0.05$). the observed difference in prevalence may have occurred by chance. However, females were more engaged with domestic work such as fetching water, cleaning, cooking, farming which may expose them to possible risk factors. The male counter parts would either engage in trading, business or driving etc. making them less frequently exposed to risk factors. The various helminths recorded in this study were *Ascaris lumbricoides* 27(4.15%), Hookwrm 11(1.69%), *Trichuris trichiura* 8(1.23%), *Stronglyloides stercoralis*, 0.31%) as shown in Table .2. The low prevalence recorded against the individual parasites may be indicative of the improved water availability, food and personal hygiene and environmental sanitation as advocated and executed by the European Union and Unicef in partnership with Anambra State government through the WASH programme that started in 2015. Most studies have recorded *Ascaris lumbricoides* and *Entamoeba histolitica* as intestinal helminth and protozoan parasites as recorded in this study in table 4.4 the Age group 31 – 40 years had the highest prevalence (25.93%), followed by 11 – 20 years (19.35%), >40 years (18.97%), 21 – 30 years 16.97% and the least being 0 – 10 years (14.38%). The age groups did not differ significantly in the observed rate of infection table 5 indicated significant improvements in hygiene practices including personal and food hygiene. This is revealed in the high prevalences of those who wash hands with clean water and soap before eating 75.08% and greater prevalence 12.00%, who do not wash hands

with clean water and soap before than those who did and were infected 6.31%. The difference in prevalence was significant ($p<0.05$).

Conclusion

Water sanitation and hygiene intervention program undertaken by the European Union, UNICEF and in partnership with Anambra state government targeted to reduce drastically the diseases associated with WASH has impacted positively on the prevalence of gastrointestinal Helminthes infections in Aguata local government area as indicated by the loss prevalence recorded in this study. Sustainability of this program is very important which will not only eliminate the parasite in the environment and host with time but also control or eliminate other diseases associated with poor access and availability to safe water, poor hygiene status (personal and food) and poor environmental sanitation.

Recommendations

1. There is need for community participation and funding
2. Anambra state government should extend the wash program to other local governments in the states.
3. Regular/ periodical deworms exercise sponsored by government. Or NGO or individual philanthropist will complement the effort of water sanitation and hygiene intervention.

References

Awolaju, B.A. and Morenkeji, O.A. (2009). Prevalence and intensity of intestinal parasits in five communities in Sout-West Nigeria. *African Journal of Biotechnology*, **8**(18): 4542−4546.

Cheesbrough, M. (1998). *District Laboratory Practice in tropical countries.* Part 1. Cambridge University Press. Pp. 190-233.

Cheesbrough, M. (2000). *District Laboratory practice in tropical countries* 3rd Edition, Part One, Cambridge University Press. Pp 209-215.

Cheesebrough, M. (2010). *District Laboratory practice in tropical countries*. Part 2. Cambridge University Press. Pp. 22-156.

Egwunyenga, O.A. and Ataikiru, D.P. (2005). Soil-transmitted helminthiasis among school age children in Ethiope East Local Government Area, Delta State, Nigeria. *African Journal of Biotechnology*, **4**:938–941.

Emmy-Egbe, I.O, Ekwesianya, E.O., Ukaga, C.N., Eneanya, C.I. and Ajaero, C.M.U. (2012). Prevalence of Intestinal Helminthes in Students of Ihiala Local Government Area OF Anambra State. *Journal of Applied Technology in Environmental Sanitation,***2***:* 23-30.

Emmy-Egbe, I.O. (2007). Prevalence of Intestinal Helminthes parasite in relation to age and occupation in Ihiala, Anambra state, Nigeria. *Natural and Applied Science Journal*,**11**: 2-6.

Emmy-Egbe, I.O., (2013). Faecal disposition methods and incidence of intestinal helminth parasites among school children in Ihiala Local Government Area, Anambra State, Nigeria. *International Science Journal*, **4**(2): 42-44.

FRNOG, J.U., Mgbemena, I.C., Emeka-Nwabunnia, I., Ugochukwu, M.G. and Awurum, I.N. (2015). Prevalence of Intestinal Parasites among Primary School Children in Three Geopolitical Zones of Imo State, Nigeria. *Science Journal of Public Health. Special Issue*: Who Is Afraid of the Microbes. **3**(51):25-28.

Mbanugo, J.I. and Onyebuchi, C.J. (2002). Prevalence of intestinal parasites in Ezinifite community, Aguata local government area of Anambra state. *The Nigerian Journal of Parasitology*, **23**(1):27-34

Nematian, J., Nematian, E., Gholamrezanezhad, A. and Asgari, A.A. (2004). Prevalence of intestinal parasitic infections and their relation with socio-economic factors and hygiene habits in Tehran primary school students. *Acta Tropica.* 9**2**(3):179–186.

Nwosu, A.B.C. (1981). The Community ecology of soil transmitted helminth infections of human in a hyperendemic area of southern Nigeria. Annals of Tropical Medicine and *Parasitology*, **75***:*197–203.

Obiukwu, M.O., Umeanaeto, P.U., Eneanya, C.I. and Nworgu, G.O. (2008). Prevalence of gastro-intestinal helminth in school children in Mbaukwu, Anambra State, Nigeria. *Annals of Tropical Medicine and Parasitology*, 101(8):705–713.

Odo, G.E., Agwu, J.E., Ekeh, F.N. Ezea, C.O., Aguoru, G.C., Anya, C., Omeje, K.O. and Ubachukwu, P.O. (2016). Prevalence of intestinal parasites among school children in Uzo-Ukwani Local Government Area of Enugu State. *International Journal of Research Studies in Microbiology and Biotechnology (IJRSMB)*, **2**(ISSUE 2): 7−14..

WHO,(1991). Basic laboratory methods in medical laboratory. World Health Organization, Geneva, Pp. 110.

WHO,(2000).Informal consultation on intestinal helminthes infection. Geneva, Switzerland: World Health Organization. Pp. 16–18.

WHO,(2002). Report on Intestinal Helminthes Infection in World Health Organization," *Technical Report Series*, 789: 345-356

WHO,(2012). The Use and Interpretation of Anthropometry. Report of a WHO Expert Committee. Geneva, Switzerland: *World Health Organization*. pp. 2–5