INTESTINAL PARASITES IN SCHOOL-AGED CHILDREN OF RUMUODOGO, EMOHUA LOCAL GOVERNMENT AREA, RIVERS STATE, NIGERIA.

ABSTRACT

Aim: An epidemiological survey was carried out to assess the prevalence of intestinal parasites in School aged Children.
Place and Duration of study: the study was carried out in Rumuodogo Community in Emohua Local Government area of Rivers State, Nigeria between the months of March to June 2019.
Methodology: The study was done by microscopic examination of stool samples from school aged children in the area. Iodine staining and normal saline were used in detection and identification of the parasites. A total of 200 faecal samples were examined.
Results: A total of 49.5% prevalence recorded (*P=.05*). The common intestinal parasites identified were *Ascaris lumbricoides* 19.5%, *Ancylostoma duodenale* 9.5%, *Trichiuris* spp. 6%, Strongyloides spp. 4.5%, *Enterobius* spp. 1%, *Taenia solium*, 1.5%, *Taenia saginata 1%, Entamoeba histolytica 4.5%, Girdia lamblia 4% and schistosoma mansoni 2%. A wide range of variation occurred in both the toilet facilities used. Pit toilet users had the highest prevalence of 62 (56.9%) amongst the age groups, 6-10 years had the highest prevalence of 55.6%. Maximum of seven children had multiple infections. The male female ration was 62:37 while the percentage for males was 43.2% and 50% for females.*
Conclusion: Regular deworming of children and environmental sanitation should be carried out to further reduce the prevalence.

Keywords; Parasites, Children, School, Rumuodogo

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1.0 INTRODUCTION

Inspite of the tremendous advances in medicine and clinical Parasitology, globally over the past few decades, human intestinal parasitic infections remain the single largest cause of human death and discomfort in school children and poor communities. A major factor that contributes to intestinal parasitic infection is poor environmental sanitation. These infections are the most prevalent in the tropical and sub-tropical regions of the world, where adequate water and sanitation are lacking [1]. In many endemic areas of the tropics, transmission has been attributed to environmental contamination interacting with human behavior and low socio-economic living standards and suitable environment [2], also contact with animals, poor hygienic practices and improper disposal of human and animal waste contributes to increase in transmission [1].

Reports by the world health organization [3], puts the figure of infected children worldwide at 880 million. This high infection is due to severe shortage in health care, education, sanitation, transport and chronic poverty [4].

Intestinal parasitic infections could have significant effect on the growth and development of children which manifests as reduced physical fitness and constrained growth due to problems such as vitamin deficiencies, inducing intestinal bleeding, and protein energy malnutrition associated with their effects. There might equally be a subtle but important development effect on cognition and educational development [4 , 5, 6].

Intestinal parasitic infection may also pose some serious consequences on human health, such as hepatomegaly, oesophageal varices and bleeding [7]. Individuals infected with helminthes according to [8], could be susceptible to other infections such as malaria and HIV.

Intestinal parasites especially *Ascaris lumbricoides*, *Trichuris trichuira* and hookworm species are most common in Nigeria. Prevalence of these parasites especially *Ascaris*, according to [1,9] has remained unchanged in the last 50years and poly-parasitism occurs. [4] reported a 70% prevalence of intestinal helminthes in school children of Khana, Rivers State. [10] equally reported 70.8% prevalence in Ilewo Ogun State Nigeria. This study was carried out to determine the prevalence of intestinal parasites in school aged children in Rumuodogo town Emohua, Rivers State.

2.0 **Materials and Methods**

2.1 Study Area

The study was carried out in Rumuodogo Community in Emohua Local Government Area of Rivers State, Nigeria. It is located at 4^0 53'0 North 6'52'0 East of the Greenwich. The area lacks a motorable road, electricity, a non-functional health center and a primary school. The vegetation is rainforest and the humidity is very high. The community is surrounded by both fresh and saline waters and their major occupations are subsistence farming and fishing.

2.2 Ethical Clearance for the study

Approval for the study was given by the school authorities and the parents and guardians of the children

2.3 Collection of stool samples

Morning stool samples were collected using sterile vials from 200 pupils with the help of their parents. The specimens were preserved in 10% formalin and transferred to the Animal and Environmental Biology laboratory of Rivers State University for analysis.

2.4 Examination of stool samples

2.4.1 Formol-Ether Concentration Technique

This method was adopted by [11]. About 1g of the stool was emulsified in about 4ml of 10ml of formol solution in a test tube. The formol solution was prepared by mixing 50% strong formaldehyde solution with 450ml distilled water. 4 ml of the formol water was added to the solution and mixed properly by shaking the mixture was filtered into a test tube using a cloth gauge and about 3-4ml diethyl ether was added and shaken vigorously and allowed to stand for 2 minutes. The mixture was centrifuged at 1000 revolutions per minute for 3 minutes. Using a glass rod, the faecal debris from the side of the tube was loosened and the test tube inverted to pour off the supernatant leaving the deposit at the bottom of the test tube in an upright position. The deposit was mixed by tapping the tube with the finger and using a Pasteur's pipette, a drop of the deposit was applied on a microscope slide mixed with Lugol's iodine, covered with a cover slip and viewed under the microscope with X10 and X40 objective respectively. The eggs and larvae of the parasites were identified with reference to Atlas of Parasitology.

2.4.2 Direct wet preparations

A little portion of stool was mixed with 2 drops of 0.85% saline solution on a slide. A drop of iodine was added and examined under the microscope [11].

2.5 Data Analysis

Data was entered into Microsoft excel 2010 and analysis done using the Chi-square statistical tool. Descriptive statistics was calculated and presented in tables [12]

3.0 Results

Table 1. Incidence of intestinal parasites in School-Aged Children in the study area

Age groups in years	(%) No. Examined	(%) No. Positive	(%) No. Negative
3-6	62 (31)	35 (56.4)	27(43.5)
7-10	72 (36)	40 (55.5)	32 (54.0)
11-14	37 (18.5)	17 (45.9)	20 (54.1)
15-18	29 (14.5)	7 (24.1)	22 (75.9)
Total	200	99 (49.5)	101 (50.5)

Table 1 shows 99 (49.5%), prevalence of intestinal parasites in the study area, children between ages 3-6 had the highest prevalence of 56.4% amongst the age groups tested.

Table 2. Sex related incidence of intestinal parasites amongst school-Aged Children in the area.

Sex	(%) No. Examined	(%) No. Positive	(%) No. Negative
Male	125 (62)	54 (43.2)	71 (56.8)
Female	75 (37.5)	45 (60)	30 (40)
Total	200	99 (49.5)	101 (50.5)

Table 2 shows a male: female ratio of 62:37. Females had a higher prevalence when compared with the males.

Table 3: Incedence of intestinal parasites species in relation to age groups

Table 3 shows that *Ascaris lumbricoides* had the highest prevalence of 19.5% while *Shistosoma mansoni*

	Age groups (Years)				
Species of Parasite	(%) 3-6	(%) 7-10	(%) 11-14	(%) 15-18	Total
Ascaris lumbricoides	18 (9)	13 (6.5)	4 (2)	4 (2)	39 (19.5)
Hookworm	7 (3.5)	6 (30)	4 (2)	2 (1)	19 (9.5)
Trichuris trichuira	3 (1.5)	5 (2.5)	3 (1.5)	1 (1.5)	12 (6.0)
Strongyloides stercolaris	2 (1)	4 (2)	3 (1.5)	0	9 (4.5)
Enterobius vermicularis	2 (10)	0	0	0	2 (1)
Schistosoma mansoni	2 (1)	1 (0.5)	1 (0.5)	0	4 (2)
Taenia	2 (1)	3 (1.5)	0	0	5 (2.5)
Entamoeba histolytica	2 (1)	5 (2.5)	0	2 (1)	9 (4.5)
Giardia lambia	4 (2)	4 (2)	0	0	8 (4)
Total (200)	42 (21)	41 (20.5)	15 (7.5)	9 (4.5)	107 (53.5)

and *Enterobius vermicularis* had the least prevalence in the study area respectively.

Table 4: Incidence of intestinal parasites with respect to dominant toilet facility in the study area.

Toilet Facility	(%) No. Examined	(%) No. Positive	(%) No. Negative
Bush	88	36 (40.9)	52 (59.0)
Pit	109	62 (56.9)	47 (43.1)
Water closet	3	0	3 (100)
Total	200	98 (49)	102 (51)

Table 4 indicates pit toilet users as having the highest prevalence of 56.9% than those who used bush.

4.0 Discussion

There has not been any previous work on the prevalence of intestinal parasites among school-aged children in the study area. From the results of this study, high prevalence of various intestinal parasites was observed.

The prevalence of 49.5 was recorded; this was lower when compared with 66.3% observed by [13] in choba community, 70% by [4] in Sii, Gwara and Gure communities in Khana Local Government Area in Rivers State and 72% finding by [14] in University of Guyana, Georgetown, Guyana.

Ascaris lumbricoides was the most prevalent parasite encountered in the study followed by hookworm and *Trichuris* species. This could be attributed to the involvement of the people in agricultural practices of farming and fishing or lack of adequate personal hygiene. Hookworm infection maybe as a result of walking or playing on infested soils bare footed.

Findings are equally in line with of [15] who reported high prevalence of *Ascaris lumbricoides*, *Necator americanus* and *Trichuris trichiura* among communities in the vicinity of Port Harcourt.

Also, [16] reported *Ascaris lumbricoides* (51.78%) occurred more frequently, followed by hookworm (25.0%) and *Trichuris trichiura* 15.18% in Rivers State.

The data shows that females had a higher prevalence of 60% which may be as a result of being involved in domestic and agricultural activities which predispose them to polluted environments. The male work in farms, far from homes and are less exposed to heavily polluted home environment and consequently less infected. This is consistent with [17].

In the case of the most toilet facility (pit) used, most people in the area are poor and unable to afford water closet. Table 5 shows that the pit latrine users had a comparative high prevalence of (56.9%) than bush toilet system. The result is in agreement with [18] who observed a high percentage of parasitic infection in Benin City among pit toilet users. But the bush users had a prevalence of (40.9%) which is equally high. This practice is a product of underdevelopment and shows lack of personal and community hygiene. The use of bush and pit as toilets is a major source of soil and water pollution and is responsible for the high incidence of soil transmitted helminth parasites in Nigeria [1,4].

Children between ages 6-10 had the highest prevalence of 55.5%. This may be as result of children in this age group walking barefooted around homes and even when going to school and swim in contaminated stream. The infection decreased in ages 11-14 and ages 15-18. This is consistent with [10] who noted 82.1% prevalence in children ages 10-11. This sequence may be attributed to the fact that children in older age groups had behavioural patterns different from those of the younger groups; more knowledge of disease, and a little improvement on personal hygiene.

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Gairdia lambia and *Entamoeba histolytica* has a prevalence of 4 and 4.5% respectively which was higher when compared to findings by [19] who recorded a 2.5% prevalence in Obio/Akpor but lower when compared to 11.7% observed by [20] in Chile. Poly-parasitism was observed in 7 out of the 200 faecal samples. The co-existence of the different parasites in the infected individuals is an important feature in the epidemiology of these parasites. This is so because the acquisition of single infection produces a different effect from acquisition of large number of worms. The most prevalent of these combinations was *Ascaris lumbricoides.*

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5.0 CONCLUSION

It was observed from this study that majority of those infected were not necessarily because of poverty but because of ignorance as a result of lack of education and good environmental sanitation (through proper waste disposal system), poor personal hygiene and shortage of drinking water. Therefore, health facilities, pipe borne water, education through enlightenment programme and improved sanitary conditions be provided since the infection is by no means than water and poor sanitary conditions.

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