

PREVALENCE OF ASCARIS *LUMBRICOIDES* (ROUNDWORM), *TRICHURIS TRICHIURA* (WHIPWORM) AND *ANCYLOSTOMA DUODENALE* (HOOKWORM) AMONG SELECTED PRIMARY SCHOOL PUPILS WITHIN ILARO.

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ABSTRACT

Ascaris lumbricoides, *Trichuris trichiura* and *Ancylostoma duodenale* are intestinal parasites that are endemic in areas with poverty, ignorance and low standard of hygiene and sanitation. The study determined the prevalent, factors and effects of this geo-helminthes among primary school pupils in Ilaro. Samples were collected from four (4) public schools to make total of 150 pupils. The samples were taken to the laboratory for analysis using the sedimentation approach of analyzing stool samples. The result shows that there is high prevalence of *Ascaris lumbricoides* with a percentage of 90.9% among the selected primary schools with low prevalence of *Trichuris trichiura* 15.9% and *Ancylostoma duodenale*, 0.0%. In conclusion, there is co-infection of *Ascaris lumbricoides* and *Trichuris trichiura* in the schools within the metropolis. The high prevalence of *Ascaris* is a pointer to poor hygiene and poor toilet facilities in the environment. Therefore, there is need for health education and provision of toilet facilities in schools and health education awareness among the pupils and their parents concerned.

Keywords: Fecal samples, Intestinal helminthes, public schools, sanitation.

Introduction

The soil-transmitted helminths are a group of parasitic nematode worms causing human infection through contact with parasite eggs or larvae that thrive in the warm and moist soil of the world's tropical and subtropical countries. It is a global public health threat and is closely associated with poverty, unsafe water and inadequate sanitation and hygiene (Bethony et al., 2006). More than one billion people worldwide are infected with one or more species of soil-transmitted helminthes (STH), of which over million pre-schoolers are at risk (WHO, 2018). The disease is associated with reduced physical activities and may worsen already compromised nutritional status of the school-aged children in rural communities. The diseases associated with soil transmitted helminth are considered to be among the group termed as neglected tropical diseases (Pullan & Brooker, 2012; Pullan, et al., 2014). Infections can cause diarrhea, abdominal pains, malnutrition, Physical and Intellectual Growth Retardations (Bethony et al., 2006). Unlike in the developed countries where public infrastructures are working, these infections can continue to be a major health problem in the third world countries. Historically, infections of *Ascaris lumbricoides* and *Trichuris trichiura* along with other intestinal parasites have been a major public health problem in Nigeria. Although, the prevalence of STH infections continuously decreased according to national surveillance data, there have been sporadic de-worming programs undertaken by government. However, there has been no national school based parasites or soil-transmitted helminthes control programme (NCDC, 2017).

Materials and Methods:

Study area:

The Study was carried out in Ilaro the Southern part of Yewa. Ilaro is a town with traditional agricultural type consisting of cassava, maize, vegetables etc. Most inhabitants are farmers while others are civil servants and traders. The major sources of water supply for the inhabitants of this area are streams, boreholes, ponds and wells. Animal wastes are extensively used to enrich the soil by the indigenes.

COLLECTION OF FAECAL SAMPLE:

The study a purposive one was conducted between Jan.2019 to May 2019. Thirty fecal samples were collected from each selected school to make a total of 150 samples. Random sampling was made from each class from primary 1 to 6. Selected pupils responded for the sample collection and each of them were given a sterile bottle for moderate size faecal samples. The collected samples were corked and then placed in the refrigerator before analysis. This helped to prevent death of those targeted parasites.

Parasite	3 Months	Once per year	Never	Test of Significance
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LABORATORY ANALYSIS

The analysis was carried out using a standard method of Sedimentation: 0.5-1.0g of the stool was collected using the spatula and emulsify in 3ml of 10% formalin, in a container;The stool emulsion was poured onto a double layer of gauze into a funnel and was collected into a centrifuge tube; The stool was washed through the gauze using 10% formalin.;3ml of ethyl acetate was added and mix well by hand.; The mixture was centrifuge for five minutes at 2000rpm.; Four layers are formed after centrifugation which are; Ethyl acetate, plug of debris, formalin and sediment.The sediment was mixed well.;Two drops of the sediment was placed on a clean slide, with iodine and the other without.;Drops of iodine were placed on it and then mixedtogether; Both slides were carefully mounted with clean cover slips to avoid air bubbles; They were then viewed under the microscope using x40 objective lens.

Statistical analysis:

Data were analysed using the χ^2 -test for comparison of relative frequencies. The level of error was at $\alpha 0.05$.

RESULTS AND DISCUSSION

Table 1: Prevalence and association of the parasite in respondents: (n=150)

Parasite	Positive	Negative	Test of significance
<i>Ascaris lumbricoides</i>	136(90.6.0%)	14(9.4.0%)	$\chi^2=15.479,$
<i>Trichuristrichiura</i>	23(15.3%)	127(84.7.0%)	P > 0.05
<i>Ancylostoma duodenale</i>	0(0.0%)	150(100.0%)	

Table 1 shows the prevalence level of each of the parasite namely: *Ascaris lumbricoides*, *Trichuristrichiura* and *Ancylostomaduodenal* .*Ascaris* has the highest prevalence of 136 (90.6), this is distantly followed by *Trichuristrichiura* and Zero Prevalence of *Ancylostoma duodenale*.

2: Prevalence of *Ascaris*, *Trichuris* and *Ancylostoma* among respondents' with history of De-worming (n=150)

Table 2: Shows the history of deworming by the pupils, statistically significance with the parasite loads in the respondents.

	Positive	Negative	Positive	Negative	Positive	Negative	
<i>Ascaris</i>	27.0(18.1%)	0 (0.0%)	61. (40.9%)	14.0 (9.1%)	48.0(31.8%)	0 (0.0%)	
<i>Trichuris</i>	7(4.6%)	20(13.3%)	14(9.3%)	61(40.6%)	4(2.6%)	44(29.3%)	$\chi^2=1.383$ P>0.05
<i>Ancylostoma</i>	0	27(18.0%)	0	75(50.0%)	0	48(32.0%)	

Table 3: Respondents' frequency of contact with soil (n=150).

Parasite	Yes		No		Test of Sig.
	Positive	Negative	Positive	Negative	
<i>Ascaris</i>	43(47.5%)	6(50.0%)	48(52.5%)	6(50.0%)	
<i>Trichuris</i>	17(11.3%)	55(36.6%)	7(4.6%)	71(47.3%)	$\chi^2= 1.874$ p <0.05
<i>Ancylostoma</i>	0	72(47.7%)	0	78(52.3%)	

Table 3: The table shows the frequency of the contact with the soil close to the toilet and infection status in pupils which is statistically significant.

Table 4: Prevalence of the diseases in relation to availability of toilet in schools (n=150)

CLOSENES S	Very close		Not too close		Far away		Farther away.		Test of Sig.
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	
<i>Ascaris</i>	42(28.0%)	44(29.3%)	34 (22.6%)	3 (2.0%)	20(13.3%)	5 (3.3%)	2 (1.3%)	0 (0.0%)	
<i>Trichuris</i>	7(46.6%)	55(36.6%)	10 (66.6%)	41 (27.3%)	3 (2.0%)	31 (20.6%)	3(2.0%)	0 (0.0%)	$\chi^2=6.04$ 4 p>0.05
<i>Ancylostoma</i>	0	61(40.6%)	0	51(34.1%)	0	38(25.3%)	0	1(2.3%)	

Table 4 shows the availability and location of pupils to the school where the pupils are attending. There is no statically significant of these factors to the prevalence of the parasite in pupils.

DISCUSSION

Soil-transmitted helminthes (STH) infections continue to plague large parts of the world. Despite efforts to introduce usage of pit-latrines instead of open defecation, mass de-worming program and improvement in water quality and sanitation, STH infections are still prevalent. The most important factors affecting the survival and spread of STH infections are; the climate conditions, sanitation and socio-economic status. Out of 150 pupils recruited for the study there was higher prevalence of *Ascaris lumbricoides* compared to *Trichuris trichiura* and *Ancylostoma duodenale*, this was in contrary to the study by Pullan (2010). Several other studies have also shown that the prevalence of ascaris is always higher among other soil transmitted helminth. In a study in Malawi by Phiri (2011), the prevalence of Ascaris was the highest compare to other soil helminthes studied together. This is contrary to another similar study conducted in Nicaragua where the prevalence of *T.trichuria* was reported to be highest (Muñoz-Antoli,2017). While the reason for this might not be clear, it could be as a result of different weather condition of the two environments. Deworming which is an occasional practices in most communities in rural area could go a long way in alleviating the problem of soil helminth, in this study the occasional use of drug and the burden of the infection showed that the parasite loads is reduced among those pupils that deworm occasionally, this is in support with the findings of Loukouri et al., (2019) where the prevalence of Ascaris was higher than other helminths. Also, Dimejesi et al., (2019) reported the prevalence of helminth in their findings to be *A. lumbricoides* (65.6%), followed by hookworm (20.6%), *S.stercoralis* (8.4%), *E.vermicularis* (3.8%) and *T. trichiura* (1.5%). This study also finds out that majority of the pupils play with soil in which the soil serve as a reservoir of these geo-helminthes which when ingested either through eating or drinking hence the high prevalence in them. Most of the pupils have their toilet very close to their house which makes it an easy access for the transmission of these geo-helminthes after visiting the toilet and onto their food. These conditions contributed to high prevalence of the helminths among the pupils.

These findings agreed with other findings which reported that soil-transmitted helminthes involving *Ascaris lumbricoides*, *Trichuris trichiura* and hook worms are highly prevalent across Nigeria and the need for regular deworming exercise and provision of basic amenities. Strategic use of anti-helminthes, health education and adequate sanitation, taking into account this epidemiologic information will help in the control of these infections. In conclusion, this study will hopefully provide a guide map of the infection pattern and assist the policy makers and other stakeholders in addressing the issue of geo-helminthes in the study area. Regular deworming exercise should be taken as priorities by all health stakeholders to reduce the burden of the diseases among children especially.

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