

PREVALENCE OF INTESTINAL HELMINTH INFESTATION AMONG PRIMARY SCHOOL PUPILS IN ABA METROPOLIS

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DOI: <https://doi.org/10.5281/zenodo.13197698>

Published Date: 03-August-2024

Abstract: A study was carried out to determine the prevalence of intestinal helminths infestation among primary school pupils in Aba metropolis. A total of 100 stool samples were randomly collected from pupils of both sexes, aging 5 - 12 years old and examined using direct smear and formol-ether concentration technique. Twelve (12%) of the samples were found positive for intestinal helminths. The Intestinal helminths observed were *Ascaris lumbricoides* 7 (58.3%) and hookworm 5 (41.7%). Pupils in the age group 10 - 12 years old had the highest prevalence of 66.7% followed by the age group 7 -9 years old (25%) the least was in age group 5 – 6 years (8.3%). There was no significance association between age and the prevalence of infestation ($p > 0.05$). Females are more infested (66.7%) than males (33.3%). There was no association between gender and prevalence of infestation ($p > 0.05$). Also there was no significant difference on the prevalence of intestinal helminths among schools ($p > 0.05$), although Ogborhill primary school has the highest number of infestation (33.3%) while Living word Academy has the lowest number (8.3%). Pupils drinking sachet water had the highest infestation (83.3%) than those drinking borehole (16.7%). There was a statistically significance association between the prevalence of infestation and the source of water ($p < 0.05$). Our study shows that pupils carry moderate intestinal parasites burden and source of water had contributory effect on the prevalence of infestation. To reduce the prevalence of intestinal helminths in the area, school based deworming campaign; public health awareness programs and improved water supply of the populace are recommended.

Keywords: intestinal helminth, primary school, *Ascaris lumbricoides*, drinking borehole, parasitic worms.

1. INTRODUCTION

Intestinal helminth infestation continue to pose major global public health concerns, especially in developing countries found in the tropical and subtropical regions. Factors such as hot and humid climate, poverty, malnutrition and high population density ensure the persistent transmission of these infections [1].

Soil-transmitted helminth (STH) infections, which are a subset of intestinal helminth infestation, are among the commonest infections worldwide, affecting the poorest and most deprived communities. They are caused by different species of parasitic worms, among which *Ascaris lumbricoides*, *Trichuris trichiura*, *Necator americanus* and *Ancylostoma duodenale* are of particular public health concern. Over 1.5 billion people, or 24% of the world's population, are infected with soil-transmitted helminths worldwide. More than 600 million people are estimated to be infected with *Strongyloides stercoralis* globally [2].

Prevalence is the number of occurrences of a medical condition or characteristic in a population at a particular time. Thus, prevalence is the frequency of that medical condition or characteristic in a population. It is usually expressed as a ratio, a fraction or a percentage of the total population. Prevalence is related to a cross-sectional design [3].

2. MATERIALS AND METHODS

STUDY AREA

The study was carried out in Aba, Abia State Nigeria which lies along the west bank of the Aba River at the intersection of roads from Port-Harcourt, Owerri, Umuahia, Ikot Ekpene and Ikot Abasi (Opobo). The city is noted for its handicrafts and most populous city in south eastern Nigeria. Aba was divided into two Local Government Areas namely; Aba South and Aba North. Aba is made up of many villages such as Aba Ukwu, Eziukwu-Aba, Obuda-Aba, Umuokpoji-Aba and other villages. Aba was established by the Ngwa clan of Igbo people of Nigeria as a market town and then later a military post was placed by the British colonial administration. Aba is a major urban settlement and Commercial Centre in a region that is surrounded by small villages and towns.

STUDY POPULATION

A total of 100 stool samples were collected from 5 Primary schools comprising of four (4) government owned schools and one (1) private school with 20 stool samples from each school. The primary schools were: Ogorhill primary school, Asa-road primary school, Okigwe road primary school, Aba-Owerri road primary school and Living Word Academy.

SAMPLE COLLECTION

One hundred (100) stool samples were collected using wide-mouthed plastic container, which was given to pupils on the day of the study, after thoroughly explaining the way of collection. After collection, the samples were sent to Microbiology Laboratory for analysis.

STUDY DESIGN

It was a cross-sectional study to determine the prevalence of intestinal helminths among primary school children in Aba metropolis between the ages of 5-12 years.

3. MICROBIOLOGICAL EXAMINATION OF STOOL SAMPLES

MACROSCOPIC EXAMINATION

The stool samples were examined macroscopically for consistency (such as soft, formed, loosed or watery), the presence of blood, mucus and parasite (that is adult worm). [4].

MICROSCOPIC EXAMINATION

Direct wet smear method:

A clean grease free microscope slide were used and a drop of normal saline was placed in the middle of the left half and a drop of lugol's iodine solution will be added in the middle of the right half of the slide.

An applicator was used to take a small of the stool. The sample was mixed with the drop of saline and immediately cover with a cover slip. Same was done for the iodine solution. The preparation were examined under the microscopic using x10 and x40 objectives. [5].

Formol Ether concentration method

1g of stool sample was transferred to a centrifuge tube containing 10ml of formol saline and emulsified well. The preparation was sieved into a clean test tube using gauze. Four milliliter (4ml) of diethyl ether were added into the filtrate, mixed, shook vigorously and centrifuged at 10,000rpm for 5mins. The supernatant was decanted and the deposit examined under the microscope using x10 and x40 objective lens. [6].

ETHICAL APPROVAL

This was obtained from ethical committee of Abia State University Teaching Hospital Aba (ABSUTH) Abia State Nigeria

INCUSION CRITERIA

Individuals within the age group of 5-12 years old were enrolled into these study through the consent of their parents or guidance.

EXCLUSIVE CRITERIA

Children whose parents or legal guidance do not approve informed consent were not permitted to partake in this study. Individuals below 5-12 years old were excluded from this study. Children who were dewormed before the period of this study were not permitted to be partakers of this study.

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STATISTICAL ANALYSIS

This was done using Chi- Square 21Test of Independence and Statistical Package for Social Sciences (SPSS) version 21.

4. RESULTS**Prevalence of Intestinal helminths among primary school pupils.**

A total of hundred stool samples were collected from primary school Pupils in Aba metropolis in Abia State. Twelve (12%) percent showed the presence of helminths while eighty- eight (88%) percent showed absence of helminths (Table1).

Types and Percentage of Intestinal Helminths Found

Two intestinal helminths namely *Ascaris lumbricoides* and Hookworm were observed from the stool samples of the pupils (Table 2). *Ascaris lumbricoides* had the percentage occurrence of 58.3% and hookworm had 41.7%.

Distribution of Parasitic Helminths According to Age.

The highest prevalence of 8 (66.7%) was observed among the age group 10 - 12 years followed by the age group 7 – 9 years 3 (25%) the least prevalence of 1 (8.3%) was from the age group 5 - 6 (Table 3). There was no significance difference in the prevalence of intestinal helminths in relation to age ($p > 0.05$).

Distribution of Parasitic Helminths According to Gender.

Table 4 shows that female pupils were more infested (66.7%) than male pupils (33.3%).The difference was also not statistically significance ($p > 0.05$).

Table 1: Prevalence of Intestinal Helminths Among Primary School Pupils

Infestation Status	Number	Percentage (%)
Negative	88	88
Positive	12	12
Total	100	100

Table 2: Types and Percentage of Intestinal Helminths Found

Helminths	Number	Percentage (%)
Ascaris lumbricoides	7	58.3
Hookworm	5	41.7
Total	12	100

Table 3: Distribution of Parasitic Helminths According to Age

Age group (years)	Number	Percentage (%)	P-value
5- 6	1	8.3	0.436
7 -9	3	25	
10-12	8	66.7	
Total	12	100	

Significant at $p < 0.05$

Table 4: Distribution of Parasitic Helminths According to Gender

Gender	Number	Percentage (%)	P-value
Male	4	33.3	0.298
Female	8	66.7	
Total	12	100	

Significant at $p < 0.05$

Distribution of Parasitic Helminths According to Schools

Among different schools investigated, Ogorhill primary school had the highest prevalence of 4 (33.3%) followed by Okigwe road primary school 3 (25%), Asa road primary school and Aba-Owerri road primary school 2 (16.7%) respectively. Living word Academy had the least 1 (8.3%) (Table 4.5). The difference in infestation between schools was not significant ($p > 0.05$).

Distribution of Parasitic Helminths According to Drinking Water Source.

On the assessment of helminths infestation due to water sources, those who use sachet water for drinking recorded the highest prevalence of 10 (83.3%) while those that use borehole water had the least 2 (16.7%) (Table 4.6). There was significant difference in the prevalence of intestinal helminths in relation to drinking water ($p < 0.05$).

Table 5: Distribution of Parasitic Helminths According to Schools

School	Number	Percentage (%)	P-value
Ogorhill Primary School	4	33.3	0.651
Asa-Road Primary School	2	16.7	
Okigwe Road Primary School	3	25	
Aba-Owerri Road Primary School	2	16.7	
Living Word Academy	1	8.3	
Total	12	100	

Significant at $p < 0.05$.

Table 6: Distribution of Parasitic Helminths According to Drinking Water Source

Water Source	Number	Percentage (%)	p-value
Borehole	2	16.7	0.042
Sachet	10	83.3	
Total	12	100	

Significant at $p < 0.05$

5. DISCUSSION

Prevalence of Intestinal Helminths Among Primary School Pupils.

The overall prevalence of intestinal helminths infestation among primary school children in Aba metropolis was 12%. This observation was higher than that of [6], who reported 10.18% among primary school pupils in Ekwulumili Nnewi South Local government Area of Anambra State. However, it was considerably lower than those of [8], [9], [10], [11], [12], [13] and [14] who reported 28.0%, 25.8%, 66.7%, 27.0%, 18.7%, 15.75%.and48.0% respectively in their studies in different parts of Nigeria. Variations in prevalence rates in these studies were reflection of the local endemicity, poor sanitary conditions and personal hygiene, high level of poverty and illiteracy, overcrowding and health habit in the various study areas. Our lower prevalence does not appear to be due to good personal hygiene among the pupils, but may be related to routine use of anti-helminthic drugs. Also mass deworming campaign by government as well as the incorporation of anti-helminthic drug into the maternity and child health (MCH) program by the Federal Government may account for this. The majority of infested cases seen probably represented re-infested cases or those who for one reason or the other had not used anti-helminthes.

6. CONCLUSION

The rate of intestinal parasitic infestation observed is of public health significance. The depilating effects of intestinal helminths infestation on school children include school absenteeism, malnutrition, mental backwardness, emaciation and retarded growth. Therefore, both state and local health authorities as well as non-governmental organizations (NGOs) should adopt health policies that will lead to the control and management of this infestation. This could be inform of routine deworming of school children, improvement on the environment, disposal of both human and other domestic waste, provision of good potable water and health education on the dangers of helminths infestation, mode of transmission and prevention of these parasites.

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