

**THE PREVALENCE OF SOIL TRANSMITTED HELMINTHES AMONG SCHOOL CHILDREN IN IFEDORE LOCAL GOVERNMENT AREA OF ONDO STATE, NIGERIA**

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**ABSTRACT:** The current status of intestinal helminthes was assessed among schools children in Ifedore Local Government of Ondo State, Nigeria. A total of 180 faecal samples were collected randomly from each of the primary schools sampled. Detection and identification were by direct microscopy. Questionnaires were administered to identify the major activities and behaviour of pupils, their knowledge about the aetiology and control of intestinal helminthes. Chi- square was used to determine if there was any relationship between age and sex on the occurrence of the helminthes. Of the 180 pupils examined, 88 (48.9%) were infected. Three parasite species observed were *Ascaris lumbricoides* (22.2%), *Strongyloides stercoralis* (12.8%), Hookworm (10.6%) and for multiple infection (3.3%). Females had higher prevalence (25.6%) than males (23.3%). No significant association was observed among worm infectivity, age and sex in the population studied. The study revealed that poor hygienic practices and unsanitary condition were responsible for the high prevalence of these helminthes. Health Education through primary health care could be used as a control measure.

**KEYWORDS:** Soil, helminthes, prevalence, infection, hookworm.

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## INTRODUCTION

Soil Transmitted Helminthes are called Neglected Tropical Diseases. Infections with Soil Transmitted (STHs) which are intestinal worms transmitted through contaminated soil are the most common infections worldwide affecting the most deprived communities [17].

Globally, more than one billion people are infected with one or more Soil Transmitted Helminthes, mainly in areas with warm and moist climate, where sanitation and hygiene are poor [14]. Soil Transmitted Helminthes are widely distributed in the tropics and subtropics of the world, where infections contribute to Anaemia, Vitamin A deficiency, malnutrition and impaired growth, delayed development and intestinal blockages [4]. Worms infect more than one third of the world's population, with the most intense infections in children and the poor. In the poorest countries, children are likely to be infected from time they stop breast-feeding and to be continually infected and re-infected for the rest of their lives. Only rarely does infection have acute consequences for children. Instead, the infection is long-term and chronic, and can negatively affect all aspects of a child's development, health, nutrition, cognitive development, learning and educational access and achievement [13].

Human beings are regarded as the only major definitive host for these parasites, although in some cases, *Ascaris lumbricoides* infection can also be acquired from pigs [8]. The parasite can live for several years in the human gastrointestinal tract. Soil Transmitted Helminthes vary greatly in size and female worms are larger than males. After maturity, each adult female produces thousands of eggs per day which leave the body in the faeces [12]. The infections of *Ascaris lumbricoides* and *Strongyloides stercoralis* are most intense in children of 5-15 years with a decline in intensity and frequently in adulthood, which may indicate changes in exposure, acquired immunity or a combination of both. Although, heavy hookworm infection occurs in childhood, frequency and intensity commonly remains high in adults even in elderly people [3]. Estimation of over one billion of the world population including 400 million school children are chronically infected with *Ascaris lumbricoides*, *Trichuris trichiura* and the Hookworms [14].

The socio-cultural status of an individual has been recognized as a major predisposing factor to intestinal helminthes infections [1]. Children of primary school age are often used to obtain information of parasitic prevalence in any community. The reason is that children are most vulnerable and easy to reach [9]. Thus studies on parasitic prevalence involving school children provide reliable information for the planning of any dependable public health programme [6]. The objective of this study was to determine the current status of Helminthiasis in the study area. The information generated can be useful for government in her programmes in public health care.

## METHODOLOGY

Ifedore Local Government Area of Ondo State is situated in the South west part of Nigeria. Vegetation is tropical and marked with two seasons; the rainy and the dry seasons. The Local Government is predominantly rural. The majority of the people lived in the rural areas as farmers, hunters and petty traders. The urban areas are made up of low and average income earners majority of who are civil servants. This study was carried out using primary school children from randomly selected schools from two towns.

### Sample collection

Ethical clearance and permission were given by the Ministry of Health, Akure and letters seeking permission to collect samples were given to the headmasters of the schools chosen for sampling. Labelled clean containers were distributed to pupil along with questionnaires containing information on age, sex, weight, toilet types and last date of de-worming. The containers with the samples were retrieved immediately and taken to the laboratory for examination of ova and parasites. In situations where samples could not be examined immediately, 10% formol saline was added to each sample as preservatives.

### Detection of parasites

Two different types of laboratory techniques for the examination of stool were employed. A small portion of stool sample was emulsified with saline and put on a slide. Cover slip was placed on the emulsion at an angle of 45° (to prevent air bubbles from forming under the cover slip) and the preparations were examined with the light microscope using x10 and x40 objectives.

For Centrifugation method, 1g of the stool was placed in a tube and 10ml of distilled water was added and shaken. It was filtered into a separate tube and centrifuged at 2000rpm speed for three minutes. The supernatant fluid was pipetted off and the eggs as residuals at the bottom of the tube was transferred into a slide and examined under x10 and x40 objectives. Results were subjected to simple percentage and chi-square analysis to determine if a significant relationship exists between the gender, age and occurrence of the isolates.

## RESULTS

Of the 180 children, 88 (48%) were observed to be infected. 46 females (52.3%), while 42 males (47.7%) had infection (Table 1). Three parasite species were encountered in the study. They were: *Ascaris lumbricoides* (45.5%), *Strongyloides stercoralis* (26.1%) and Hookworm (21.6%). Both single and multiple infections were observed. A few children had two parasite species concurrently (6.8%) while a greater percentage of the children were infected with only one parasite species (Table 2). In age group 5-9 year, the parasite species recorded (30.7%) in males and (23.9) in females. In age group 10-14, males recorded (17.0%) and females (28.4%) infection (Table 3). For the weight relationship, <15kg had (1.1%) for males while no infection was found in the only female examined. 15-25kg recorded (23.9%) and (28.4%) for male and females respectively. 26-36 kg recorded (9.1%) in males and (23.9%) for females, 37-47kg had (2.3%) and (10.2%) respectively and >48kg recorded (1.1%) for females (Table 4)

There was no significant difference between gender and age on the prevalence of infection among the sampled children, since the calculated Chi- square value of 1.33 and 0.01 for gender and age respectively is less than the critical value of 3.84 at two degree of freedom and p-value of 0.05. Therefore, there was no evidence to suggest that there was gender or age relationship and infection prevalence among sampled children.

Table 1: Total population of Male/Female infected.

Sex	Total Population	Number infected	% infected
Male	78	42 (47.7)	23.3
Female	102	46 (52.3)	25.6
Total	180	88 (100.0)	48.9

Table 2: The Distribution of parasite species amongst the Pupils in the study area.

Parasite Species	Number Examined	Number infected (%)
<i>Ascaris lumbricoides</i>	180	40 (45.5)
Hook worm	180	19 (21.6)
<i>Strongyloides stercoralis</i>	180	23 (26.1)
Multiple infection	180	6 (6.8)
Total	180	88 (100.0)

Table 3: Age-related prevalence of Soil Transmitted Helminths amongst the Pupils.

Age group (Year)	Sex	No. Examined	No. infected (%)
5-9	Male	50	27 (30.7)
	Female	49	21 (23.9)
10-14	Male	28	15 (17.0)
	Female	53	25 (28.4)
Total		180	88 (100.0)

Table 4: Weight-related prevalence of Soil Transmitted Helminths among the Pupils.

Weight (Kg)	Sex	No. Examined	No. infected (%)
< 5	Male	3	1 (1.1)
	Female	1	0 (0.0)
15 – 25	Male	46	21 (23.9)
	Female	48	25 (28.4)
26 – 36	Male	25	8 (9.1)
	Female	38	21 (23.9)
37 – 47	Male	4	2 (2.3)
	Female	14	9 (10.2)
> 48	Male	0	0 (0.0)
	Female	1	1 (1.1)
Total		180	88 (100.0)

## DISCUSSION

The high prevalence of helminthes recorded in the study area could be attributed to exposure of the pupils to predisposing factors to parasitic infections; poor sewage disposal system, unsafe sources of water, poor sanitary conditions, poor housing and lack of awareness on the part of the parents and pupils [9,11].

The study revealed that *Ascaris lumbricoides* (22.2%), *Strongyloides stercoralis* (12.8%) and Hookworm (10.6%) were common in the sampled groups. This suggests unsanitary habits especially in handling of foods and drinks. Multiple infection varied with *A.lumbricoides* and Hookworm (3.4%); *A. lumbricoides* and *S. stercoralis* (1.1%), and Hookworm and *S.stercoralis* (2.3%).

Sex- related prevalence was higher in the females (Table 1), although there was no significant difference ( $p > 0.05$ ) between prevalence in females and that of the males. This may be attributed to female exposure levels to play groups on sand, hawking, sharing of food with unwashed hands and other domestic chores. This result contradicts previous study by [7]. The reports of this study clearly showed that there was a difference in infection rate between the age groups sampled.

The prevalence of infection was higher in the age group 5year- 9year where the males recorded (30.7%) and the females (23.9%). These are the years when food, fruits and snacks are frequently shared among friends when purchased from food vendors as previously reported by [2]. This may be as a result of children paying little or no attention to personal and general hygiene; walking bare footed, dirty hands are used to share foods, passing viable ova to one another. Also it may be because they eat food and snacks wrapped with papers from doubtful sources which may have been contaminated as suggested by [5].The 10-14year age group recorded a higher infection rate in females (28.4%) than in males (17.0%). This is so because female children are more actively involved in carrying out activities in and out of their immediate environment thereby exposing them to infection. Also the difference in the infection rate between age groups 5-9year and 10-14year could be due to the build up of immunity as age increased [10]. There was no significant difference ( $p>0.05$ ) between age groups and infection.

Weight-dependent prevalence was higher in (15-25kg) weight categories where the females recorded (28.4%) and males (23.9%). The 5-10year age groups fall into this weight category where they are exposed to infected soil due to unhygienic practices. In administering drugs, the weight of the recipients of the drug is considered for the appropriate dosage.

Infection from soil transmitted helminthes result in malnutrition, anaemia, mental and growth retardation. There is need to provide safe water; for drinking and domestic use. Health Education taught in schools should emphasize more on preventive measures against those diseases whose control revolves around hygiene and effective primary health system. Non Governmental Organisations (NGOs) should be practically involved in the control of Soil Transmitted Helminthes (STHs) through public enlightenment on the undesirable consequences of the infection on children.

## CONCLUSION

The study revealed a high level of soil transmitted helminthes burden, a situation which is not too good for physical, mental and cognitive development of children. State and Local governments should embark on measures to control the spread of helminthes infection among children in Ifedore Local Government Area of Ondo State.

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