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Survey of Intestinal Helminth Infections amongst Primary School Pupils in Ozubulu, Anambra State Nigeria

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Abstract
Survey of frequency of intestinal helminth infections was carried out amongst school pupils in 4 primary schools in Ozubulu, Anambra state, Nigeria.
A total of 260 stool samples were randomly collected from both males and females from age range of 5-16 years old. Direct smear and formol- ether concentration techniques for stool analysis were employed.
A total of 125(48.08%) out of the 260 subjects were found to be positive for various intestinal helminthes with hookworm accounting for 66(25.38%), Ascaris lumbricoides 40(15.38%), Trichuris trichuria 15(5.77%) and mixed infection of Ascaris and hookworm 4(1.54%). Female pupils had the highest prevalence rate of 76(55.47%) and male with a rate of 49(39.84%) which was statistically significant at P<0.005 among the schools under study. Nza central school had the highest infection rate of 45(69.23%) and Amakwa central school had the least rate of 22(33.85%) and it was statistically significant at P<0.05. Infections were also detected in all the age groups with 11-13 years old recording the highest rate of 77(85.77%) while 5-7years had the least rate of 3(11.54%). Also pupils whose parents were farmers had infection rate of 73(59.84%). From this study it can be seen that mass deworming of pupils in all the schools is very much needed hence it has shown an index of the prevailing unhygienic environment, poor personal hygiene and poverty.

Keywords: Deworming, Intestinal Helminth, Infections, Environment, Platyhelminthes

Introduction
Intestinal helminthes are a group of worms that use the body lumen of the gut as the normal locations for their adult forms. However the 3 common intestinal helminthes that usually occur together in May rural areas are Ascaris lumbricoides, Trichuris trichuria and hookworm (Emojevwe et al., 2002).
Helminthes include many other worms, such as tissue parasites as well as many free living species. These are classified into Platyhelminthes and Nemathelminths.
Platyhelminthes are divided into 2 classes namely. Cestoidea and Trematodea while Nemathelminths has only one class called nematodea (Ichhupujani and Rajesh, 2002).
Characteristically, helminthes are considerably longer than protozoan parasite and are microscopic ranging in size from less than one meter or more. They do not possess organ of locomotion. Locomotion is generally by muscular contraction and relaxation. Digestive system is primitive. Reproduction is well developed. Eggs are produced in numbers, as few of them survive and manage to infect a suitable host (lchhupujani and Rajesh, 2002). Mode of transmission of intestinal helminth varies widely such as ingestion, inhalation, or cutaneous perpetration. Humans are exposed to hookworm infection by third stage filariform larvae when it perpetrates the skin exposed to contaminated soil. (PCD, 1997). Helminth infections are the most common and infective agents of mankind and are responsible for morbidity and mortality throughout the developing world. Worldwide morbidity rates directly due to these infections are estimated at 135,000 deaths annually (Saviola et al., 2004). The infection was ranked highest in morbidity rate among school age children who often present much heavy worm infection because of their vulnerability to nutritional

deficiency (Bethony *et al.*, 2006). Helminth infections are of major public health concerns because factors that predispose man to the infection such as poor environmental hygiene, poverty, malnutrition and ignorance abound in the sub-region (ljabore and Olagunju, 2006).

Helminth infections are usually asymptomatic but heavy infection may produce serious clinical symptoms such as abdominal pains, weight loss or epigastric pain, rectal prolapse, obstruction, perforation, bleeding, malnutrition and probably death (Janes, 1991), out of fear many parents request unnecessary excessive or repeating treatment for their children (Stoll, 1994).

Anosike *et al* (2005) said that in a world of 2.2billion inhabitants there existed over 200million helminthes. Infections with about 1.5million Nigerians suffering from Ascariasis alone where there are several thousand with Strongyloidiasis, Trichuriasis, Enterobiasis, and hookworm infections. Many researchers in Nigeria had reported high prevalence of human intestinal infections in urban areas but very little was found in rural communities (Lujan *et al.*, 1998). This study was carried out to actually determine the prevalence of intestinal helminth infections amongst primary school pupils in relation to age, sex and the occupation of parents.

Materials and Methods

The study was carried out in four public primary schools in Ozubulu, Ekwusigo local government area of Anambra state, Nigeria. The schools are located in Amakwa, Egbema, Eziora and Nza. These are rural communities in Igbo heartland. The people are mainly traders and civil servants.

Sample population

A total of 260 pupils were examined and 65 each from the four primary schools under investigation. The study sample includes 123 males and 137 females aged between 5 and 16 from primaries 1 to 6.

Sample collection

A well labeled clean dry transparent wide mouthed specimen container was given to each of the pupils to collect fresh stool samples into the containers. Each stool sample was properly registered in the practical register. 10% formol saline was put into the stool samples after collection and the stool samples transported to the medical parasitology laboratory of Joint general hospital, Ozubulu.

Stool analysis

A microscopy examination of the stool sample was carried out to identify any adult worm, color and consistency present. The stool was then examined parasitologically using two methods described by Lotto (2003).

Direct smear method

A drop of normal saline and iodine were both placed on a grease free slide.using applicator sticks smears were made and covered with coverslips. The smears were examined microscopically using x10 and x40 objective lenses for identification of parasites.

Concentration method

About 3 grams of well mixed stool sample was emulsified in 7ml of formal saline in a clean glass test –tube with the aid of applicators stick. The preparation was sieved into a beaker using wire gauze. About 3ml of ether was added to the filtrate in a test tube and shaken vigorously to mix. A drop of the sediment was transferred to a clean grease free slide and covered with a clean coverslip. It was examined microscopically using 10x and 40x object lenses for parasite identification.

Results

A total of 260 stool samples were examined in the four primary schools in Ozubulu. Out of the 260 stool samples, 125 (48.08%) were positive for various intestinal parasites, the highest intestinal helminths was hookworm 66(25.38%), followed by Ascaris 40 (15.38%) and Trichuris trichuria 15(5.77%). Also mixed infection of Ascaris and hookworm were also recorded in 4 (1.54%) pupils. It was also noticed that one or more intestinal helminths were recorded in the age groups between 5 to 16 years old. The pupils in the age group of 11-13 years old had the highest infection rate of 77 (58.77%), followed by 14-16 years group 10 (50.00%), the least infection rate was found among 5-7 years group 3(11-54%) as stated in table 1.

Table 2 shows those 123 males and 137 females were examined out of which 49(39.84%) males and 76(55.47%) females were infected. Also the percentage of infection varied in the four primary schools examined ranging from 33.85% to 69.23%. Nza central school recorded the highest infection rate of 45 (69.23%) followed by Egbema community primary school 30 (46.15%), then Eziora central school 28(43.08%) which Amakwa central school had the least rate of 22 (33.8%)

Figure 1 shows the prevalence based on the pupils parents occupational groups farmers had the highest infection rate of 73(59.84%) followed by trader 20(46.51&) while the children of civil servants recorded the least rate of 32(33.68%)

Table 1: Distribution of intestinal helminth infection in relation to age groups

Pupil Age	Total Number Examined	No of Hookworm (%)	No. of Ascaris (%)	No. Trichuris trichuria (%)	Mixed infection Ascaris and Hookworm (%)	Total (%)
5-7	26	0(0.00)	2(7.69)	1(3.85)	0(0.00)	3(11.54)
8-10	83	16(19.28)	9(10.84)	9(10.84)	1(1.20)	35(42.17)
11-13	131	42(32.06)	28(21.37)	5(3.82)	2(1.53)	77(58.77)
14-16	20	8(40.00)	1(5.00)	0(0.00)	1(5.00)	10(50.00)
Total	260	66(25.38)	40(15.38)	15(5.77)	4(1.54)	125(48.08)

Table 2: Distribution of males and females in primary schools

Primary school examined	Males No. Examined No Positive (%)		Females No. Examined No Positive (%)		Total No. examined	No Positive (%)
Nza Central School	29	17(85.62)	36	28(77.77)	65	45(69.23)

Egbema Community Primary School	34	10(29.41)	31	20(64.51)	65	30(46.15)
Eziora Central School	40	13(32.50)	25	15(60.00)	65	28(43.08)
Amakwa Central School	20	9(4.50)	45	13(28.88)	65	22(33.85)
Total	123	49(39.84)	137	76(55.74)	260	124(48.08)

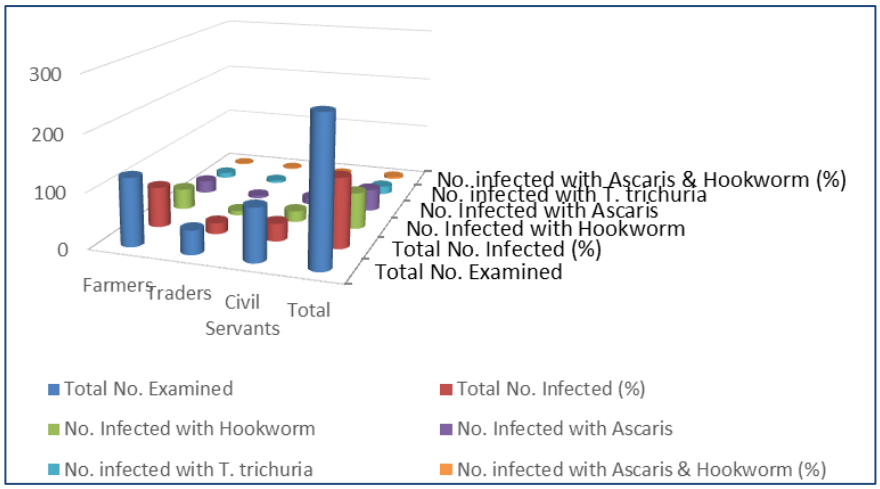

Fig.1: Distribution of Intestinal Helminth Infection Based on Pupils Parent's Occupation in the Primary School Examined

Discussion

The result gotten from this investigation shows a fairly high prevalence rate of helminth infection among the pupils. These infections pose a very serious threat to our hopes for healthy living in Nigeria rural communities. The overall prevalence rate of 125 (48.08%) recorded in the study appears to be in tandem with what has been observed in south west region (50.4%) by Adeyeba and Akinlabi (2002); the environment of this communities and socio-cultural habits of the people could be responsible for the high prevalence of intestinal helminth infections in these areas. The most prevalent helminthes in the area under study were hookworm 66 (25.38%) and Ascaris 40 (11.38%) and also mixed infection of both agrees with a similar work by Aisen *et al*., (2002).

This data has revealed that the level of prevalence has not changed over the years despite some improved environmental development in the country as a way of monthly environmental sanitation exercises by most state governments. In relation to sex, more females were infected than the males. The high rate recorded by the female could be as a result of the proximity of their vagina to the Anus and as a result of back passage which is associated with their pattern of clean up after defecation. The females also assist their parents in farm work and carry out domestic duties in the house and at the stream more than the males. Statistically there was significant difference between the infection rate and sexes ($P<0.05$). The highest infection rate was observed in Nza school compared to others, this could be that there was no toilet in the school premises and defecation is usually done in the bush. The pupils within age range of 11-13 years was the highest, this could be as a result of this age bracket always helping their guardian/parents in farm work. And most of them walk bare footed in the farm. Ages 5-7 years had least rate, this could be due to their young age as they are not actively involved in domestic activities. Pupils from parents engaged in farm work had highest rate of infection as a result of the farm work they are engaged in and most cases, they bath and swim in the streams as revealed by Akogun and Badake (1998).

Conclusion

This study has exposed a high level of intestinal helminthes infection amongst pupils. Consequently, there is the need for parents to have their children screened and dewormed from time to time; the health control programs in school are efficient and cost effective benefiting not only school children but the staff and the communities. It can also be seen that helminthic diseases, neglected in the past are now on public agenda and their control will have lasting impact on Nigerian children and they tend to benefit from this renewed interest Olaniyi *et al* (2007). Policy makers in Nigeria should grab the opportunity and include a system of deworming exercise in the school curriculum.

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