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Full Length Research Paper

Survey of *Ascaris lumbricoides* among pupils of primary school in Jos south local government area of Plateau State, Nigeria

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***Ascaris lumbricoides* was surveyed among pupils of primary schools in Jos south local government. Four schools were visited: National Research Institute Staff Primary School, Rita Primary School, Joseph Primary School and St Andrew Primary School. A total of 471 samples were collected from pupils of these schools and processed using formol-ether concentration technique. Only 1 (0.2%) pupil from St Andrew Primary School was positive for *A. lumbricoides*. The prevalence of the infection among the age group showed that 1 (0.9%) in the age group (5 to 9) years was positive while the sex distribution showed a prevalence of 1(0.4%) among the male and no positive case was recorded among the females. The overall prevalence of other parasitic infections was 8.3% with hookworm having the highest prevalence of (5.3%), followed by *Entamoeba histolytica* with (0.6%), and *Giardia lamblia* (0.5%), while *Hymenolepis nana* and *Taenia* species had both a prevalence of (0.2%).**

Key word: *Ascaris lumbricoides,* hookworm, *Taenia,* prevalence, primary schools, Jos, Plateau State, Nigeria.

INTRODUCTION

Ascaris lumbricoides is an intestinal nematode (round worm) which belong to the super family Ascaridodea. It is the etiological agent of ascariasis which infects man. Humans become infected by ingesting infective eggs in contaminated food, water or from hands that have become faecally contaminated. Following ingestion, the larvae hatch in the circulation where they are carried to the heart and lungs (Andrade et al., 2001). They remain in the alveoli for several days, ascend the respiratory tree to the epiglottis where they descend to the esophagus. Their maturation is achieved in the intestine, after mating the female lays large numbers of eggs which are passed in the faeces (Ukoli, 1991; Cheesbrough, 1987). It is particularly common in areas of inadequate sanitation where untreated humans faeces are used for fertilization or (as fertilizers) (Cheesbrough, 1987). *Ascaris* worms are large heavy infection, especially in children; worm masses can cause obstruction or perforation of the intestine and occasionally obstruction of the bile ducts and pancreatic ducts (Braids, 1986). Though infection with a few worms may be symptomaless, heavy infections are serious, as will be known to anybody who has seen marasmic children with distended bellies starved 80 to 100 worms (Denhams et al., 1985). *A. lumbricoides* is a prominent parasite in both temperate and tropical zones but it is more common in warm temperate countries and is more prevalent where sanitation is poor. Harold et al. (1983) stated that *Ascaris* occurs at all ages, but it is most prevalent in the 5 to 9 years old group of pre-school and young school children, who are more frequently exposed to contami-nated soil than the adults. The incidence is approximately the same in both sexes; the poor classes in urban and rural areas are most affected by the parasite due to soil pollution and poor hygiene. Infection is a house hold affair, the family being the unit of dissemination, infected children, provides the chief source of soil contamination by their indiscriminate defaecation in door yards and earthen-floored houses, where the resistant eggs remain

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Table 1. Prevalence of *Ascaris* infection per school.

School	No. examined	No. positive	Prevalence (%)
NVRI Staff primary school	138	0.0	0.0
St. Rita Primary school	82	0.0	0.0
St Andrew Primary school	123	1.0	0.8
St Joseph Primary school	128	0.0	0.0
Total	471	1.0	0.2

viable for long periods.

Ascaris is controlled by preventing soil from becoming faecally polluted by providing and using adequate latrine. Avoiding the used of untreated humans faeces as fertilizer. Treated infected individuals are part of a controlled programme. It can also be controlled by preventing eggs from being ingested by washing the hands before eating, avoiding eating of uncooked vegetables, green salads and fruits which may be contaminated with *Ascaris* eggs from polluted soil (Seo, 1983).

MATERIALS AND METHODS

Study area

Vom is located in south western part of Jos under Jos south local government area of Plateau State, about 12 km from Bukuru, the local government headquarters. Vom is a rural village with traditional agricultural type, consisting of rice, corn maize, potatoes and vegetables. The area is characterized by tropical climate and grass land savannah vegetation. Apart from being farmers some of the inhabitants are civil servants and traders. The rainy season lasts from March to November while most people are employed daily taking care of the crops. Animal's wastes are extensively used to enrich the soil by the indigenes.

Selection of schools

Four primary schools were selected for this study, namely National Research Institute Staff Primary School, Rita Primary School, Joseph Primary School and St Andrew Primary School. Pupils were randomly selected for this study.

Collection and examination of faecal sample

A total of 471 pupils were sampled at the end of 3 months, every pupil was provided with a specimen bottle and received an instruction of supplying it with a stool sample from his early morning stool the following day. Sample were then received the next day, carried back to the laboratory and immediately processed. The formol-ether concentration technique described by Allen and Ridley (1970) was used to examine samples and each was examined macroscopically and then microscopically.

Macroscopic examination

Each sample was examined macroscopically for the presence of adult worms, segments of cestodes, blood, and mucus. The colour, odour and consistency of the stool sample were recorded on a log sheet referring to every pupil. Also the socio-demographic (age and sex) of each child in the study population were noted.

Microscopic examination

Formol-ether concentration method

1 g of sample was placed in a test tube and 5 ml of normal saline was added and emulsified thoroughly, it was then centrifuged at 3000 rpm for 3 min and supernatant was discarded. The process was repeated until the supernatant was clear. 7 ml of 10% formol-saline was added to the deposit and was mixed thoroughly, 3 ml of ether was added and covered with a rubber bank, and shaken vigorously before centrifugation at 3000 rpm for 3 min, the supernatant was discarded and deposit examined using ×10 and ×10 objective respectively. And the data generated was analyzed by the statistic software Epi–info for windows version 8.0 for a study power of 95% at a study probability level of 5% significance.

RESULTS

A total of four hundred and seventy one (471) samples were examined. 1(0.2%) was positive for *A. lumbricoide*s and other parasites identified in this study were hookworm 5.3%(n=25), *Entamoeba histolytica* 0.6%(n=3), *Giardia lamblia* 0.5%(n=7), *Taenia* species 0.2%(n=1), *Trichuris Trichiura* 0.2%(n=1),*Hymenolopis-nana* 0.2%(n=1), *Schistosoma mansoni* 0.2% (n=1)

DISCUSSION

Out of 471 pupils recruited for the study, 1(0.2%) gave an overall prevalence of *A. lumbricoides* as shown in Table 1. This is significantly lower than the findings of Basir (1998) who recorded 1% in Jos; it also disagrees with Itoe (1996) and Damshark (1998) who recorded 2.5 and 2.0% respectively in plateau state. Also there is a signifi-cant difference with that of Kofie and Dipeolu (1983), which stated about 67.5% and oluwaseyi (1986) who recorded 43.7% for the same parasites. Celia et al. (1989) recorded 88.5% in Ile-Ife and Oduntan (1974) recorded 79.1%, this also disagree with the work of Soreson et al. (1996), who state that *A. lumbricoides* was the most commonest infection and he also reported 77% prevalence among children.

Table 2 shows the sex distribution which shows only 1(0.4%) male was positive for *A. lumbricoides* this is not

Table 2. Sex distribution and prevalence of *Ascaris* infection among the study population.

Sex	No. examined	No. positive	Prevalence (%)
Male	235	1.0	0.4
Female	236	0.0	0.0
Total	471	1.0	0.4

Table 3. Age distribution and prevalence of *Ascaris* infection among the study population.

Age group	No. examined	No. positive	Prevalence (%)
5-7	107	1.0	0.93
8-9	104	0.0	0.0
10-11	93	0.0	0.0
12 and above	164	0.0	0.0
Total	471	1.0	0.2

Table 4. Prevalence of other parasitic infection.

Other parasite	No. examined	No. positive	Prevalence (%)
Hookworm	471	25	5.3
Trichuris Trichuira	471	1	0.2
Hymenolopis nana	471	1	0.2
Taenia Species	471	1	0.2
Schistosoma species	471	1	0.2
Gardia Lamblia	471	7	0.5
Entamoeba histolytica	471	3	0.6
Total	471	39	8.3

not in agreement with Elekwa and Ikeh (1996) which show a slightly higher prevalence among girls compare to boys and it is similar with that recorded by Cort (1992), Stoll (1993), Sawyer (1995), Hill (1996) and Chandler et al. (1995) whose result shows higher prevalence among males in relation to their female counter part. Table 3 shows the age distribution. This shows the infection rate on age group 5 to 7 years of 0.9% and this agrees with the works of Kofie and Dipeolu (1983), Eaton (1985) and Sorenson et al. (1996) who reported that *A. lumbricoides* infection is common in children under the age of 10. The low prevalence of *A. lumbricoides* may be as a result of treatment of infected children who were screened by the previous researcher who had carried out the same work in the environment and probably the pupils must have been educated on the mode of infection and ways of preventing the infection hence very low prevalence was obtained in the survey.

Table 4 shows the prevalence of other parasitic infections among pupils on the study, it shows that a total of thirty nine samples were positive for seven different species of other intestinal parasite. Hookworm had the highest prevalence rate of 5.3% followed by *E. histolytica* with 0.6% and *G. lamblia* with 0.4%, *T. Trichuira, S. mansoni, H.nana and Taenia* species each had a prevalence of 0.2%. This result agrees with Basir (1998) who obtained similar result in his study. The above result is also in line with the observations of Damshak (1998) and Itoe (1996).

The highest prevalence of hookworm may be as a result of children walking with bare feet on infected ground and as such give way for the penetration of the infective larvae. Indiscriminate defaecation habits around homes, ignorance about this parasite and poor standard of hygiene must have contributed to the rate of infection of this parasite. The prevalence of *E. histolytica (*0.6%) must have been contacted through ingesting contaminated foods and water or through playing on infected soil. Furthermore; the ingestion could have been acquired by eating food items sold by hawkers who are carriers of the parasite (infected food handlers) who sell food/things within the school premises.

CONCLUSION AND RECOMMENDATIONS

Based on the findings and observations, infected persons should be treated and adequate attention should be given

to awareness, and children should be educated on the mode of infection and epidemiology of the parasite.

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