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Prevalence of Parasitic Infections among Students in a Large Rural Community Secondary School in Essien Udim L. G. A. of Akwa Ibom State, Nigeria (Pp. 468-474)

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Abstract

The prevalence of gastro-intestinal parasites was investigated in a large community secondary school in the rural community of Essien Udim Local Government Area. Faecal specimens were collected from 400 students, randomly selected from the school and examined microscopically for the presence of intestinal parasites. Direct wet smear and formol-ether concentration techniques were applied in the examination of the stool specimens. Of the 400 specimens examined, 143 (13.35%), were positive for parasites. The prevalence of parasites found were as follows: Ascaris sp 50 (12.50%), Trichuris 37 (9.25%), Hookworm 27 (6.75%), Enterobius sp 11 (2.75), Hymenolepis sp 13 (3.25%), Taenia sp 5 (1.25%). Male students had higher, 84 (21.00%) prevalence than females, 59 (14.75%). Males in the 12-14 and 15-17 age groups and females in the 15-17 years age group were the most infected. More females have infections than males. The differences between male and female infections was significant at $p > 0.05$. The general effects of the parasites on the infected students was constant absenteeism

reduced mental ability, general weakness resulting in low grades in school examinations. Health education conducted included advice on the provision of modern toilet facilities and borehole water in the study area and immediate surrounding communities.

Introduction

Infections with intestinal parasites are a medical and public health problem of growing significance, especially in the rural communities of a developing country like Nigeria. Several factors such as food habit, complex social and cultural interactions that bring about body contact, sharing of clothing and low body and environmental hygiene have contributed to an increase in the incidence of parasitic infections in recent years. The most important of these factors is the low hygiene or insanitary living conditions in our environments. Large numbers of our people live and work in areas where they are exposed to parasite infections.

The unsuspected high incidence of parasitic infections and the difficulty of diagnosis have been reported (WHO, 1987). Stolls generalization, decades (ago) as to the total number of helminthic infections in the world was 2.2 billions. The incidence might have been greatly over-estimated, but the situation as regards these parasites in the developing countries can hardly be much better. Moreover, the presence of these parasites in the schools and colleges is frequently not detected by routine examinations performed in many clinical laboratories. Rarely does a physician obtain accurate diagnostic work in parasitology from their clinical laboratory. As a result of this his index of suspicion for intestinal parasitic diseases is low. Human intestinal parasites cause the greater cases of mortality and morbidity in most developing countries of the world. As already stated the high incidence of parasitic infection in the tropical and sub-tropical regions is due to insanitary living condition especially in the rural communities. These intestinal parasitic infections are reported to be among the most prevalent human infections attacking approximately one quarter of the world populations especially school children (WHO, 1987). The prevalence of human intestinal parasites in urban areas of Nigeria has been reported (Bundi, 1990., Ndifon, 1991. and Chan, 1997). Not much has been done about the prevalence of these parasites in the rural communities, especially the one under investigation.

The objectives of this study therefore were:

- (1) To assess the prevalence of human intestinal parasites among various sexes and age groups in a rural community secondary

school in Essien Udim Local Government Area, Akwa Ibom State,

- (2) To make recommendations for improvement in sanitation among the rural community dwellers.

Materials and Methods

The study was carried out in Ekpenyong Atai rural community secondary school in Essien Udim Local Government Area of Akwa Ibom State, Nigeria. The inhabitants of the community in which the school is located are mainly peasant farmers. They depend on bore holes, wells rain water and river water for their water supply. Pit latrines are common and contaminated bushes with human faeces is very common occurrence.

Four hundred (400) students were randomly selected from (JS 1 – SS 3), to cover a cross section of the students in the school. Each student selected was given a clean screw-capped plastic container, with labels for name, sex and age. All the students were instructed on the proper methods of collecting specimens to avoid contamination. Specimens were collected in 8 batches of 50 each time and taken to the laboratory for examination.

Procedures in examination of stool specimens

No single techniques of stool examination will yield satisfactorily results for detection of all stages of the parasites, for this reason a combination of two techniques of examination was employed:

- i) Double wet smear technique (Cheesbrough, 2005).
- ii) Formol-ether concentration techniques (Ndifon, 1991. and Smith and Bartlett, 1991).

Double Wet Smear

A drop of saturated saline was placed in the centre half of a slide and a drop of iodine stain was placed on the half. A section of sample obtained from gut was then spread evenly throughout the drop of iodine stain and saturated saline. A cover slip was carefully lowered on the slide and viewed under the compound microscope.

Formol-Ether Concentration Techniques

Faeces were emulsified in formol water. Suspended and large fecal particles were removed by passing the fecal emulsion through 2.5mm mesh strainer. Ethyl acetate was then added to the resulting emulsion which was taken in

test tubes and centrifuged at 1500v.p.m for 5 minutes. The supernatant was decanted and a solution of the concentrate was made by adding few drops of distil water. 2 drops of the solution were smeared at a time on a slide and viewed on a microscope.

Results

Altogether four hundred (400) specimens were examined for parasites in their various stages of developments. Of the 400 specimens examined, 228 were from male students and 172 specimens were from female students respectively. 84 (22.25%) of the males were positive while 59 (14.75%) of the female specimens were positive.

Table 1 shows that 50 (12.50%) of the specimens were positive for *Ascaris* infections. But of this 25 (6.25%) were from males while 23 (5.75%) were from females. 37 (9.25%) specimens were positive for *Trichuris* and of this number 22 (5.5%) were males, while 15 (3.25%) were females. 27 (6.75%) of the specimens were positive for Hookworm of this number 18 (4.5%) were from males and only 9 (2.25%) were from females. 13 (3.25%) were positive for *Hymenolepis sp* of this number 10 (2.50%) were from males and 3 (0.75%) were from females. A total of 11 (2.75%) specimens were positive for *Enterobius* infections. 8 (2.00%) were from females, while 3 (0.75%) were from males. The trend of infection was reversed here, and the reason is not clear. Only 5 (1.25%) specimen were positive for *Taenia* infections and 4 (1.00%) were from males and 1 (0.25%) was from a female. The overall prevalence of infections in five species of parasites was higher in males than in females. But in *Enterobius* infections as already stated, the trend was reversed, more females were infected. The most affected were males in the 12-14 and 15 – 17 age and females in the 15-17 years age group respectively. The difference between males and females infectivity was significant at $P>0.05$.

Infected students were generally weak and had low grades in school examinations due to mental retardation.

Discussion

Human parasitic infectious is a serious threat to health of both humans and other animals and hence is a medical and public health problem of growing significance. Several factors have contributed to an increase in the incidence of parasitic infection; chief among these is the insanitary living conditions in our environments. The environmental circumstances are such that many contracted intestinal parasites are conveniently widely spread. Moreover

people are constantly moving into areas where parasites abound and primitive methods of sanitation and hygiene exist. Large numbers of our people live and work in areas where they are exposed to these infections.

The prevalence of the six intestinal parasites in the students of the community school is an indication that the living and environmental conditions and habits of the people favour the transmission of these intestinal parasites. *Ascaris*, Hookworm and *Trichuris* infections were the most prevalent, with *Ascaris* topping the list. This finding agrees with the report of Mbanugo and Onyebuchi, (2002). But *Trichuris* infections were absent in that report. The prevalence of 50 (12.50%) for *Ascaris*, 37 (9.25%) for *Trichuris* and 27 (6.75%) for Hookworm infections respectively, suggests a potential public health problem arising from these infections.

Ramsay *et al*; (2003), in an earlier study elsewhere in the country reported a prevalence of 34% for *Ascaris*. The low prevalence of 13 (3.5%), 11 (2.75%) and 1.25% recorded for *Hymenolepis sp*, *Enterobius sp*, and *Taenia sp* infections respectively is in contrast with previous reference studies which reported a prevalence of 30.1% for Hookworm, and 17.7% for *Hymenolepis* but these were observed in different areas of the country.

The low prevalence of *Taenia* could be related to dietary custom. People in the study area rarely eat pork meat. People who rarely eat pork meat rarely harbour *Taenia*, the pork tapeworm (Mbanugo and Onyebuchi, 2002). The second highest prevalence *Trichuris* (9.25%) was observed in the 12-14 years age group whereas that of *Ascaris* (12.50%) was observed in the 15-17 years age group in both males and female. These observations in the 2 middle age groups may be attributed to more frequent exposures to sources of infection. The overall infection for males and females (all age groups) were slightly different, higher for males than for females. However, for those infected, 84 (21.00%) males and 59 (14.75) females, was significant at ($P>0.05$).

The impact of the parasites recovered in this research is enormous. Victims often experience constipation, abdominal pains, headache, muscles aches and cough. Other symptoms included itching, and diarrhea. Heavy infestation of Hookworm often results in serious problem (Chan, 1997). Rodriguez-G *et al* (2003) had reported deficiencies in iron, total energy, protein and zinc in Hookworm patients. The overall effect in school children, which was the case in the study area, is constant absenteeism, reduced mental ability leading to low grades in school examinations, and general weakness making the students stay back from school after break hours. We recommend health

education campaigns to include provision of modern toilet facilities, and digging of bore-holes in the communities.

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**Parasitic Infection among Students in a Rural Community Secondary School in Essien Udum Loca,
Government Area of Akwa Ibom State, Nigeria**

Age Group	Total no. Examined		Total No Positive (%)		Ascaris sp. No Positive (%)		Trichuris sp. No Positive (%)		Hookworm No Positive (%)		Enterobius sp. No Positive (%)		Hymenolepis sp. No Positive (%)		Taenia sp. No Positive (%)	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
9-11	56	24	20 (35.71)	8 (33.3)	5 (8.92)	1 (4.20)	7 (12.5)	3 (12.5)	4 (7.14)	0 (0.00)	1 (1.79)	3 (1.25)	3 (5.35)	0 (0.00)	0 (0.00)	1 (1.00)
12-14	80	55	28 (25.00)	12 (2.18)	8 (10.00)	3 (5.45)	12 (15.00)	6 (10.90)	6 (7.50)	2 (3.64)	0 (0.00)	1 (1.81)	2 (2.50)	0 (0.00)	0 (0.00)	0 (0.00)
15-17	50	66	28 (35.00)	35 (53.03)	10 (20.00)	16 (24.24)	3 (6.0)	5 (15.15)	3 (6.0)	0 (0.00)	2 (4.0)	4 (6.06)	4 (8.00)	3 (4.55)	4 (8.00)	0 (0.00)
18-20	39	25	6 (15.38)	4 (66.59)	2 (5.13)	0 (0.00)	0 (0.00)	1 (4.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
21 and above	3	2	2 (66.57)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Σ	228	172	84 (21.00)	59 (14.75)	27 (6.75)	23 (5.75)	22 (5.5)	15 (3.75)	18 (4.5)	9 (2.25)	3 (0.75)	8 (2.00)	10 (2.50)	3 (0.75)	4 (1.00)	1 (0.25)