

SOIL TRANSMITTED HELMINTHIASIS AMONG APPARENTLY HEALTHY CHILDREN IN KANO MUNICIPALITY

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ABSTRACT

The prevalence of soil transmitted helminth infections in apparently healthy children of mean age 12.2 years drawn randomly from one school in each of the four local government areas of Kano, northern Nigeria were evaluated. Stool sample from 570 children were analyzed using formol ether concentration technique. 130(22.8%) of the subject were infected by soil transmitted helminthes (STH). The overall prevalence by species were *Ascaris Lumbricoides* (7.9%), Hookworm (5.3%) and *trichuris trichiura* (3.5%) respectively. 35(6.1%) of the subjects were infected with two or more soil transmitted helminthes. The prevalence in males (24.2%) was generally higher than that of females (22%), Hookworm infection was high(45.5%) in the 15-20 years old age group, while *Ascaris Lumbricoides* infection was high (100%) in the 6-10 years old age group. The mean number of eggs per gramme (epg) of faeces was moderate. The study shows that subjects had high intensity of infections for *Ascaris Lumbricoides* hook worm, *trichuris trichiura* as epg of faeces counted were high in them compared to what was obtained for mixed infections. It also reveals a moderately high prevalence across board for all soil transmitted helminth (STH) in Ungogo local government.

(Keywords: Soil transmitted helminthes, Children, prevalence.)

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INTRODUCTION

It was estimated that more than one billion people in the world are infected with soil transmitted helminth (STH), mainly *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworm (Crompton, 1999).

The problem of STH is more in children of school age (although it may affect other age groups), and is often

associated with impaired cognitive function and learning ability, reduced physical activity and poor growth (Strepenson et al., 1998; Nokes et al., 1996). Mobility particularly acute in children who are most at

risk with heavy infection. Heavy worm load result in nutritional deficiency due to poor diet, and these are more

pronounced during child development and growth. STH causes major human illness (Hall et al., 1982; Udensi, 1983; Elkiwa, 1984). *Ascari lumbricoides* has been associated with the obstruction of the large biliary and pancreatic ducts. Hookworm infection is linked with iron deficiency anaemia (Layrisee et al., 1983). There are also documented cases of persistent auto-infection with *Stngiloides stercoralis* induced chronic intestinal dermatological symptoms. Immuno-suppresses patients are especially prone potentially fatal symptoms of hyper-infection with parasie (Cook, 1986).

By improving the living condition and sanitation, STH infections may be controlled. The high degree of poverty and very poor economic status has however affected its successful implementation.

This study was undertaken to determine the prevalence of STH infections among apparently healthy children in Kano, and to help profer suggestions to policy makers depending on the findings.

MATERIALS AND METHODS

The Study Area and Subjects

The study population was from four(4) Local Government Areas of Kano municipality. Inhabitants of the area are mainly indigenous farmers, students and public servants who reside among the majority indigenous population.

The subjects were 570 apparently healthy primary and secondary school children aged 6-20 years, randomly selected, with lottery method (Ben et al., 1991) from a school in each of the four Local Government Areas. The different Local Government and the number of

subjects analyzed from them include Tarauni (105), Kumbotso (110), Fagge (175) and Ungogo (180). Verbal consent was obtained from the Headmasters and Principals of the schools before stool containers were distributed to subjects. Stool samples were voided, collected and analyzed the day using formol ether concentration technique as described by Monica Cheesbrough for the stool concentration and microscopical examination of helminth ova, and stool's counting method (technique) (Cheebrough, 1999) for counting helminth epg.

The examination of the stool sample was carried out at the Parasitology Laboratory of the Department of Medical Microbiology and Parasitology, Aminu Kano Teaching Hospital (AKTH), Kano. To ensure consistency of the readings, second readings were performed in 20% of the slides randomly selected as described by Andrade et al. (2001).

RESULTS

The results obtained from the study were as shown in tables 1,2,3, and 4.

Table 1 shows the total prevalence of soil transmitted helminth (STH) infections by age and sex of the 570 stool samples examined, 130 (22.8%) were infected with soil transmitted helminth (STH). The prevalence in the males was (24.2%) while in the females, the prevalence was (22%). In the three age categories, STH infections were highest in 15-20 years group in both males and females.

Table 2 shows the general prevalence of STH by species among apparently healthy children in the

study area. *Ascari lumbricoides* had the highest overall infection rate of 7.9%. Prevalence of *Ascari lumbricoides* was also the highest in schools in three out of the four local government areas studied. Overall prevalence of other STH were Hookworm(5.3%) and *trichuris trichiura* (13.9% and 8.3% respectively) was observed in the school from Ungogo local government. In addition 35(6.1%) of the subjects were infected by two or more STH. Of these, 28 had double infection and 7 had infection. Infection rates were highest among children from schools located in Ungogo local government and Kumbotso local government (13.9% and 4.6% respectively).

Table 3 shows the distribution of helminth in different age groups. The highest prevalence of *Ascari Lumbricoides* infection (100%) was recorded in the 6-10 years old age group, while its lowest prevalence (9.1%) was observed in the 15-20 years old age group.

The highest prevalence of hookworm (45.5%) was observed in the 15-20 years old age group, while the lowest was observed in the 6-10 years old age group. The highest prevalence of *trichuris trichiura* (21.4%) was observed in 11-143 years old age group.

Table 4 shows the egg count of each helminth per infected subject. The highest and lowest number of eggs per subjects (15,000epg and 800eog respectively) was seen in children from school in Ungogo local government. Also egg per gramme of faeces (epg) obtained from the four *Ascari lumbricoides*, *Trichuris trichiura* and hookworm as compared with what was obtained for the mixed infection.

Table 1. Total Prevalence of Soil Transmitted Helminth (STH)**Infections by Age and Sex**

Age (years)	Male			Female			Overall		
	No Exam	No Infected	% Prevalence	No Exam	No Infected	% Prevalence	No Exam	No Infected	% Prevalence
6-11	40	5	12.5	55	0	0	95	5	5.3
11-14	200	35	17.5	150	35	23.3	350	70	20
15-20	7-	35	50	55	20	36.4	125	55	44
Total	310	75	24.2	260	55	22.0	570	130	22.8

Table 2: General Prevalence of Soil Transmitted Helminth (STH)**Among Apparent Healthy Children in the Study Area**

School	K* No of Children Examined	A. lumbricoides		Hookworm		T. trichiura		Mixed infection	
		No Infected	% Prevalence	No Infected	% Prevalence	No Infected	% Prevalence	No Infected	% Prevalence
TRN	105	5	4.8	5	4.8	0	0	0	0
KBT	110	10	9.1	0	0	0	0	0	0
TGE	175	20	11.4	0	0	5	2.9	5	2.9
UNG	180	10	5.6	25	13.9	15	8.3	25	13.9
Total	570	45	7.9	30	5.3	20	3.5	35	6.1

* Number of apparently healthy children in each local government

TRN = Tarauni

KBT = Kumbotso

FGE = Fagge

UNG = Ungogo

Table 3. The Distribution of each Helminth and their Prevalence as seen in each Age Group

	6-7 years	11-14 years	15-20 years	Total Positive Examined
Ascaris lumbricoides	5(100%)	35(50%)	5(9.1%)	45
Trichuris trichiura	0	15(21.4%)	5(9.1%)	20
Hookworm	0	5(7.1%)	25(45.5%)	30
Mixed infection	0	15(21.4%)	20(36.4%)	35
Total Positive Infection	5	70	55	130

Table 4. Egg Count of each Helminth Per Infection Subject

Helminth	Tarauni LG	Kumbotso LG	Fagge LG	Ungogo LG
Ascaris lumbricoides	8000epg	i. 7000epg ii. 940epg	i. 12000epg ii. 10000epg iii. 8000epg	9000epg
Trichuris trichiura	-	-	4000epg	i. 6000epg ii. 7000epg iii. 5000epg
Hookworm	5000epg	-	-	i. 5000epg ii. 5000epg iii. 7500epg iv. 15000epg v. 5000epg
Mixed infection	-	2000epg	3000epg	i. 1000epg ii. 1000epg iii. 1000epg iv. 1200epg v. 800epg

DISCUSSION AND CONCLUSION

Data obtained from this study are similar to those observed in other epidemiological studies conducted in other parts of Nigeria. The overall studies (Obiamiwe, 1977; Nwosu, 1981; Obiamwe and Nmorsi, 1991; Udonsi, 1984; Ukpai and Ugwu, 2003), while the prevalence of helminth infections is similar to that observed in other epidemiological studies (Okpala, 1956; Ejezie, 1981; Odewolo, 1988), the common triad being *Ascaris lumbricoides* (7.9%), *Hook* (5.3%) and *Trichuris trichiura* (3.5%).

The high prevalence of *Ascaris lumbricoides* (100%) within 6-10 years old age group could be linked to the route of infection being faecaloral, since children within the age group are easily susceptible due to poor level of hygiene.

Similarly, the high prevalence of *Hookworm* (45.5%) in the 15-20 years old age group could also be due to the route of infection being skin penetration.

Children of this group are more vulnerable to infection while playing on moist or swimming in stagnant muddy water. This study also shows that helminthic infection decreases with age.

Generally, there is an appreciably high helminth count in the four Local Government Areas. However, the zero egg count observed for *Trichuris trichiura* in both Tarauni and Kumbotso Local Governments, as well as the one observed for *Hookworm* in both Kumbotso and Fagge Local Governments may not reflect the actual situation on ground because majority of the children may have been infected predominantly with male worms, hence reduced egg count. The reason for this high prevalence rate of infection may be attributed to shortage of portable water, indiscriminate defaecation, poor environment and lack of personal hygiene.

In conclusion, this shows a relatively moderate prevalence of soil transmitted helminth (STH) among the apparently healthy children population. In view of the morbidity and medical complication of soil transmitted helminthiasis(e.g. toxemia, anaemia, tissue perforation and occlusion of the gut), routine medical check-up should be encouraged in school children. The use of chemotherapy (periodic deworming), health

education and improved socio-economic conditions should be advocated as a infection may be shortage water, indiscriminate defecation, poor environment and lack of personal hygiene.

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helminthiasis (e.g. toxæmia, anaemia, tissue perforation and occlusion of the gut), routine medical check-up should be encouraged in school children. The use of chemotherapy (periodic deworming), health education and improved socio-economic conditions should be advocated as a means of effecting a proper control of STH, and reduction of morbidity caused by it.

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