

Prevalence of Intestinal Parasites under the Fingernails of Pupils in Pankshin Plateau State, Nigeria

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Abstract

This study was carried out to investigate the presence of intestinal parasites under the fingernails of school pupils in Pankshin Local Government Area of Plateau State, Nigeria. Five primary schools were randomly selected for the study. Dirt samples were taken from pupils of the various schools on the appointed days of their schools. The samples were taken randomly from two hundred pupils (200) in each of the five schools. Samples were taken to the laboratory for centrifuge at 2000 revolutions per minute (rpm) for the parasite. The supernatant was discarded and the sediments was observed under a microscope for parasites. Five different general species were isolated namely *Schistoma mansoni*, *Encylostoma* species, *Tanea* species, *Ascaris* species and mite eggs. The five schools sampled, the prevalence rate was observed as follows: LEA Primary School Tambes= 15(7.5%) LEA Primary School Bwarak= 16 (8.0%) LEA Primary School Duk 25 (12.5%) LEA Primary School Bet 12 (6.0%) LEA Primary School Holy Cross 11 (5.5%). It is therefore recommended that primary school pupils should be de-wormed periodically for intestinal parasites. The school authorities should keep their environment tidy. Health education lessons should be taught with emphasis.

Keywords: *Prevalence, Under fingernails, intestinal parasites, species and pupils.*

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Background to the Study

A parasite is an organism that is in close association with another organism that is the host (usually of a different species) and metabolically dependant, directly or indirectly on it to some extent. (Jenifer, 2004) All over the world, parasites in general cause a lot of disease to man and his domestic animals. They affect the economy of a people as a lot of money, time and energy is invested in the control of parasites and the treatment of affected people (Christopher, 2012).

Helminthes and protozoan occur throughout the developing world and are most common in forest communities (Savioli *et al.*, 1992). A lot of effort were been made to control these intestinal parasites, but this has proved abortive (Ogbe and Odudu, 1988). 200 million people suffered from diarrhea associated with intestinal parasites in any given 24-hour period and that the world annual incidence of diarrhea episodes is estimated over 5 million deaths each year. (Omar, 2013).

Intestinal parasites cause untold misery from time immemorial; they inflict damages on the host such as loss of weight and abdominal pain. They also cause diarrhea, malnutrition, stunted growth, apathy, insomnia, irritability, decreased ability to resist infection, vomiting behavioural and psychological disturbances, impaired ability to do physical and mental work. Children experiencing these effects are less attentive in class; they are always absent from school either attending a clinic or just too weak to move. Such children are found to be backward in their academic performance. (Neva and Brown, 1994, Mafiana 1995).

Prevalence of parasites amongst school aged children occurs throughout the developing world. The prevalence in Nigeria has also been found to be high. (Mafiana 1995 and Rashidul 2007). This is not unconnected with the dirty habits of children (Karrar and Rahim, 1995). By way of regular contact with feacally contaminated soil, the handling and eating of foods with unwashed hands that have been contaminated with the soil and feaces. All these tend to favour the transmission of parasites (Madani, 1989).

In Pankshin, the general sanitary condition is poor. Animal husbandry is poor such that animals such as goats, sheep, cattle, pigs and chicken roam the streets, school and residential compounds defecating into the soil (Dada and Bellino, 1997) in addition, it is common to see heaps of rubbish dumps around the streets human habitation and schools. Human, especially children, defecate in the open or at any available space and corners. The soil is therefore, contaminated with faecal materials which may contain eggs and cysts of parasites (Duniya, 2000).

Children are in the habit of playing in such contaminated environment and thereby soiled their hands, especially the underneath of the fingernails which are usually dirty and could therefore serve as a reservoir for microorganisms such as eggs/cysts of parasites from where transmission is made possible when the fingers get into the mouth. Given this understanding, this study was designed with the aim of establishing the potential of the dirt in the underneath fingernails as a source of transmission of parasite to children.

Objectives of the Study

1. To determine the prevalence of parasites eggs and cysts underneath the fingernails of pupils with trimmed and untrimmed
2. To determine the identity of parasite eggs/cysts so involved.

It is hoped that the accomplishment of this study will permit the understanding of the role of the underneath the fingernails in the dynamics of transmission of parasitic infections to pupils

Methodology

The Study Area

The study area was Pankshin Local Government Area, located in the central part of plateau. The vegetation of Pankshin is tropical savannah with distinct wet and dry seasons. The inhabitants are engaged in civil service work, farming, cattle rearing, fishing, hunting and petty trading. Government hospitals, dispensaries and private clinics were fairly distributed in the area. There are over 30 government and private schools in the area and the Federal College of Education (FCE), Pankshin. A considerable number of the inhabitants of Pankshin are staff of the Federal College of Education (F.C.E).

Selected Schools and their General Conditions

The schools chosen for the study are as follows.

1. LEA Primary School Tambes Pankshin
2. LEA Primary School Bet
3. LEA Primary School Bwarak Pankshin
4. LEA Primary School Duk.
5. Pilot Science Primary School Holy Cross Pankshin

Ethical Consideration

Before embarking on the study, permission was sought from the authorities of the schools after educating them on the significance of the study. Dirt samples were taken from pupils of the various schools on the appointed days in their schools; the samples were taken randomly from 200 pupils (male and female) in each of the five schools, giving a total of 1000 samples. The condition of the pupils' fingernails, whether trimmed or untrimmed were noted. Trimmed nails were those that had been cut and showing no visible hyponichium. Untrimmed nails were showing visible nail outgrowth.

Sample Collection

Sterile cotton balls, soaked in 10% formol saline, were used to swab the underneath of the fingernails of both hands of each pupil. The balls for each pupil were placed in a labeled capped plastic container containing 5ml 10% formol saline. The samples were thereafter taken to the laboratory for parasitological analysis.

Laboratory Examination of Samples

In the laboratory, the cotton balls in each container were rotated using a pair of forceps and rinsed inside the capped bottles using 5ml formal saline to dislodge the swabbed content into the liquid medium. The used cotton balls were then disposed off. The content of each

bottle was poured into centrifuge tubes and the bottle rinsed with 3ml of ether which was further poured into the centrifuge tubes. The suspension was shaken vigorously for proper mixing inside the tube. Thereafter, the tubes were centrifuged at 2,000 revolutions per minute (rpm) for 2 minutes. The supernatant was discarded leaving the sediment in a small volume of liquid that drained back from the sides of the tubes to their bottoms (Neva and Brown, 1994). The sediment was properly mixed using a pair of forceps, a drop placed on a slide and mixed with a drop of 2% aqueous iodine, a glass cover slide placed on it and examined microscopically at 400 magnifications (Cheesbrough, 1992)

Data Analysis

The data obtained was analyzed for all the schools and for each school on the basis of trimmed and untrimmed nails. Anova was used to determine the standard error and the least significant difference (LSD). ($P \leq 0.05$)

Results/Discussion

It was observed that Pankshin environment has poor sanitation area. Refuse dumps are a common sight in addition to poor drainage system. Animal husbandry is so poor that animals such as goats, sheep, cattle, pigs and chickens roamed about defecating on the streets and around peoples' surroundings. In addition, most homes do not have good toilet facilities, and so many people, particularly children, defecated in the open. These conditions are similar to that of Samaru Zaria as reported by Dyek (2001). Similarly, the climate of Pankshin is sub-humid with six months of special seasonal rainfall of about 1092.2mm annually occurring between the months of April and October (Census News, 1992)

The sanitary conditions of the schools were also noted. It was observed that the compounds of most schools had been turned to rubbish dumping sites, especially those of Pilot Science Primary School Pankshin by the residents of homes near such schools. Those heaps of rubbish had not been cleared for months as at the period of the research making the environment an eye sore. In addition, cattle graze the grass in and around the school compounds. Other animals such as dogs, pigs, etc, roam about freely. All schools except LEA Primary School Tambes did not have functional toilet facilities. In these schools, pupils defecate around the school compounds especially behind the classrooms. They seat on the floor in their classrooms to receive lessons. Placed their books and write on the floor thereby having contact with the floor.

During break or free class times, the pupils play outdoors in the soil and near garbage dumps hereby soiling their hands and school uniform. The situation was a little different in the LEA Primary School Tambes where the school was situated a bit far from resident houses, which reduced the rate of refuse dumping around the school. Of the 1000 samples examined, 42 (7%) had eggs of parasites or adult ectoparasites. In the five schools sampled, the prevalence was observed as follows: LEA Primary School Tambes 15 (7.5 %), LEA Primary School Bwarak 16 (8%), Holy Cross Primary School 11 (5.5%), LEA Bet 12 (6%), LEA Duk 25 (12.5%).

Table 1: General Prevalence in each school

Name of School	Number Examined	Prevalence	
		Number of positive	Percentage of positive
	VI	V ₂	V ₃
LEA Primary School Tambes	200	15	7.5
LEA Primary School Bet	200	12	6.0
LEA Primary School Bwarak	200	16	8.0
LEA Primary School Duk	200	25	12.5
LEA Primary. School Holy Cross.	200	11	5.5
Total	1000	79	39.5
LSD(0.05)	0.00	4.96	2.47

Prevalence in relation to condition of fingernails

If the difference between any 2 > LSD there is significance difference.

Of the 1000 pupils examined, 399 had trimmed fingernails of which 21 (5.26%) of them were positive for parasites. Of the 601 with untrimmed fingernails, 58 (9.65%) were positive. Untrimmed fingernails showed a higher prevalence than the trimmed ones, but this difference was not statistically significant ($p > 0.05$).

Of the 200 samples examined in each school, the highest prevalence of 12.5% was observed in Duk while Bwarak had 8% positive from pupils with untrimmed fingernails. In all the schools examined, trimmed fingernails had the least prevalence. There was no significance difference ($P > 0.05$) between Tambes and Bet, Bwarak, Bet and Tambes both there was significance difference ($P < 0.05$) Duk and Holy Cross.

Table 2: Prevalence in relation to condition of fingernails

Status of fingernails	LEA Pri. Sch. Tambes			LEA Pri. Sch. Bet			LEA Pri. Sch. Bwarak			LEA Pri. Sch. Duk			LEA Pri. Sch. H. Cross			Total		
	a	b	%	a	b	%	a	b	%	a	b	%	a	b	%	A	b	%
Trimmed	77	0	0	109	4	3.8	57	4	5.4	68	4	12.3	89	9	5.5	399	21	5.3
Untrimmed	123	16	4.9	91	7	7.9	143	11	10.6	132	8	12.2	111	16	6.8	601	58	9.7

a= number examined, b= number positive

Identity and prevalence of parasite eggs isolated.

Eggs of five parasite general species were isolated. These include, *Schistosoma mansoni* (%). *Teania spp* (%) *Ascaris spp* (%) hookworm *spp* (%) mite eggs (%). In addition, an adult louse (%) was encountered. No mixed infection was encountered.

Conclusion/Recommendations

The result of this study is an eye opener on potential risks of parasitic infections and so are of public health importance to those exposed to infections in view of morbidity and medical complications of parasites. Intestinal parasites were found in all the five primary schools studied, with LEA Primary School having the highest prevalence. These problems are surmountable if proper sanitation is followed.

It is therefore recommended that primary school pupils should be dewormed periodically for intestinal parasites. The school authorities should keep their environment tidy. Health education lessons should be taught with emphasis.

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