



Prevalence of Intestinal Helminthic Infections among Pupils in Kware, Sokoto State

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Present study was carried out to investigate the prevalence of the intestinal helminthic infection among pupils in Kware, Sokoto. Sarkin Yamma Model Primary School Kware pupils were selected by simple random selection. A total of 250 samples were collected from the pupils and analyzed using wet mount technique; out of which 65 (26.0%) were found positives. *Ascaris lumbricoides* was significantly found most prevalent 18.0% (45) among the pupil, followed by *Schistosoma mansoni* 6.0% (15) then *Taenia saginata* 2.0% (5). Gender specific prevalence showed that, males had higher prevalence rate of 29.2% (40) while female had 25 (18.0%) and significant association was observed ($P < 0.01$). Although significant association was not observed ($P > 0.01$) with respect to age group prevalence rate seen to decreased with increase of the pupils age. Pupils aged ≤ 7 years had a highest prevalence rate of 36.7% (18), followed by those pupils with aged between 8-10 years old 29.7% (19) then 11-13 years old with 17 (21.5%) and those with ≥ 14 years old had the least prevalence of 19.0% (11). It was recommended that, further study should investigate the intensity for the intestinal helminthic infection among the pupils in the study area.

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1. INTRODUCTION

Intestinal helminths also known as intestinal worms are worldwide distributed and responsible for the disease called helminthiasis. The pediatric age groups are the most vulnerable [1]. The worms constitute considerable public health problems especially in developing countries where hygiene is poor [2]. In Nigeria, intestinal parasitic helminths infections among pediatric age groups are endemic in many part of the country [3]. The morbidity and mortality associated with these diseases are so enormous that the world health organization has paid special attention to their control under its special programs and researches [3]. Sokoto, is one of the states where these worms may be found because majority of the people had poor personal hygiene, poor environmental sanitation and their children were playing in faecally contaminated soil and water. Despite the fact that, the numerous eggs are available in the soil and contaminated water which can be directly or indirectly ingested, also people used human faeces as fertilizer directly due to its long life resistance in soil and people consuming vegetable in the area are at the risk of having helminthiasis [4]. Hence it becomes necessary to investigate the prevalence of helminths infections among the pupils in the study area with respect to parasite species, gender and age group.

2. MATERIALS AND METHODS

2.1 Study Area

Kware is a local government area in Sokoto State, Nigeria. 13°13'5"N 5°16'2"E / 13.21806°N 5.267220E. This study was conducted at Sarkin Yamma Model Primary School located at Kware town in Kware Local Government area of Sokoto. The population of Kware Local Government area is about 134, 084 based on the 2006 census analysis. In terms of religion, the inhabitant people are about 99% Muslims, thus Islam is the major religion of people living in the area. Kware Local Government area is 554 km² and 281.2 inch/km² away from Sokoto metropolis, the occupational activities of the people living in the area include: Farming, fishing, business, rearing of animals, while some of them are civil servant [5].

2.2 Ethical Approval

Written introduction letter was obtained from Head of Biological Sciences, Sokoto State

University, Sokoto. Permission was also obtained from district heads of community and Head Master of the Primary School. When seeking the consent from the research participants, the objectives and procedures of the study were clearly explained to them in local language (Hausa). Participants were informed that they will be withdrawn from the study without any consequences as a result of any fault. Hence, signature or thumb-print was used to indicate that each participant and his guardians/parents agreed to participate before starting the survey.

2.3 Sample Collection

Two hundred and fifty (250) stool samples were collected from the primary school pupils between 8:00am to 12noon, clean universal container were given to the children for stool collection, each bottle was labelled accordingly corresponded with the number of the questionnaire given to each pupil. The specimen was transferred to comprehensive health care Usmanu Danfodiyo University Teaching Hospital Sokoto, Kware branch, in an ice block container for analysis [6].

2.4 Sample Analysis

Collected samples were analyzed using wet mount method. The stool sample were placed on a free grease slides contained a drop of saline and iodine, the sample on the slide had been emulsified using applicator stick by stirring it gently. The slide has been covered with a cover slip and placed in the microscope and observed for the types and nature of the helminthes [7].

2.5 Statistical Analysis

The prevalence was calculated by dividing the number of positive sample with a total number of sample analyzed multiply by hundred, chi square (χ^2) was used to show out significant association for the results obtained base on sex, and age group of the pupils in the study area using Minitab statistical software package.

3. RESULTS AND DISCUSSION

Out of two hundred and fifty (250) faecal samples analyzed, a total of 65 (65.0%) were found positive. This higher infection rate among the pupils in the study area was attributed to the higher level of unhygienic habits, poor sanitary

Table 1. Distribution of intestinal helminthic infection with respect to parasite among pupils in Sarkin Yamma Primary School Kware

Parasites	Number of slides examined	Number infected	Prevalence rate (%)	P value
<i>Ascaris lumbricoides</i>	250	45	18.0	0.000
<i>Schistosoma mansoni</i>	250	15	6.0	
<i>Taenia saginata</i>	250	5	2.0	
Total	250	65	26.0	

Table 2. Gender and age specific prevalence of intestinal helminths parasites among the pupils in the study area

Sex	Number of slides examined	Number infected	Prevalence rate (%)	P value
Male	137	40	29.2	0.001
Female	133	25	18.8	
Total	250	65	26.0	
Age	Number of slides examined	Number infected	Prevalence rate (%)	P value
≤ 7	64	19	36.7	0.415
8-10	79	17	29.7	
11-13	49	18	21.5	
≥ 14	58	11	19.0	
Total	250	65	26.0	

conditions, illiteracy and absence of basic social amenities among the pupils which enhance transmission. The area also, lacks basic social amenities such as adequate portable drinking water and health facilities. People defecate indiscriminately. All these factors promote the spread of parasite infection [8].

Ascaris lumbricoides was most prevalent 18.0% (45) followed by those infected *Schistosoma mansoni* 6.0% (15) and least prevalence of 2.0% (5) was found to be infected with *Taenia saginata* (Table 1). Statistically significant association was observed for the prevalence infection among the pupils with respect to parasites species. $P < 0.01$. These results were in agreement with the report of Mafiana et al. [9].

Distribution of intestinal helminthic infection with regards to gender showed that males had the highest prevalence rate of 29.2% (40); while females had prevalence rate of 18.8% (25). Table 2, there was significant association for the infection with the helminthes based on gender; $P < 0.01$. Higher infection might be attributed to their males due to greater contact with contaminated places such as the faecally contaminated soil (which serve as their playground) and infected water bodies (where they usually swim, bath and wash their clothes) hence, males become highly infected during any of the above activities [10]. While females are generally limited in to their houses and do not

frequently go to contaminated places for playing; therefore, they are less exposed to the sources of infection [11].

Prevalence of intestinal helminthic infection based on ages showed that, pupils with the aged ≤ 7 had the highest prevalence rate of 36.7% (18), followed by pupils aged between 8-10 years old 29.7% (19), then 11-13 years old 21.5% (17) and pupils within ≥ 14 years old had least infection rate of 19.0% (11). Table 2. Significant association was not observed for the infection rate of helminths among the pupils in the study area based on their age group ($P > 0.01$). The highest prevalence rate for the aged ≤ 7 might be attributed to the fact that, most of the time pupils within the age group (≤ 7) engaged themselves in the activities that exposed them to the sources of infection such as playing in faecally polluted soils, indiscriminately defecating around houses, eating unwashed fruits and vegetables [12]; in addition weak immune system possessed by young aged group lead them most susceptible age group as reported by Maizels et al. [13].

4. CONCLUSION

This study revealed the prevalence of intestinal helminths parasites infection among school age children in Sarkin Yamma Model Primary School at Kware. It showed the higher occurrence of *Ascaris lumbricoides*; Male pupils were observed

to have the higher prevalence rate of infection than females and age specific prevalence rate indicated that, the group of ≤ 7 years had the highest prevalence than others. It was recommended that, further study should investigate the intensity for the infection with the intestinal helminths among the pupils in the study area; the authorities concerned should provide with the treatments to the infected pupils; adequate social amenities such as safe drinking water and others. Household and government should embark on frequent general environmental sanitation programme.

CONSENT

When seeking the consent from the research participants, the objectives and procedures of the study were clearly explained to them in local language (Hausa). Hence, signature or thumb-print was used to indicate that each participant and his guardians/parents agreed to participate before starting the survey.

ETHICAL APPROVAL

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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