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Prevalence of Intestinal Helminthiasis among Selected Undergraduate Hostel Students in the Federal University of Technology, Akure, Nigeria

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ABSTRACT

This study was carried out to assess the prevalence of human intestinal helminth parasites among undergraduate students residing in the campus hostels of The Federal University of Technology Akure, Nigeria. A total 200 subjects' faecal samples were collected randomly from male and female hostel students. Faecal analysis was carried out using formol-ether concentration technique examine stool samples for the presence of ova, larvae and adult forms of human intestinal helminth parasites. Of the 200 students stool samples examined, 96 persons (48.00%) were found infected with helminthiasis. The overall gender related prevalence of intestinal helminthiasis was observed to be high (53.0%) in female students than in male students (43.0%). In male and females, prevalence was high (40.0%) among students within the age group 23-26 years old than students in age group 14-18 years old with 8.0% prevalence. Sex-based prevalence of human intestinal helminth parasites among the subjects was not significantly different ($P > 0.05$). The parasite species identified and their respective prevalence were Ascaris lumbricoides (22.5%), Trichuris trichura (11.5%), Hook worm (7.0%), Strongyloides stercoralis (5.0%) and Taenia species (2.0%). This study revealed high prevalence of intestinal helminth parasites among the students residing in the university hostels.

Key words: *Intestinal, Helminthtiasis, Undergraduate, Students, Prevalence.*

INTRODUCTION

Human intestinal helminth parasitic infections have worldwide focal distribution and have been implicated as the greatest single cause of illness and diseaseworldwide[7]. About 3.5 billion people, most of whom are young growing children and undergraduates residing in developed countries are affected due to their poor hygienic nature or poor sanitary conditions coupled with their voracious eating habits[19]. People of all ages are affected by this cycle of prevalent parasitic infections; children, being the worst affected[2]. The prevalence of geo helminthic infections has remained relatively at high level over the past 5 decades[9].

Human gastrointestinal helminthes are one of the most prevalent forms of parasitic disease[3]. *Ascaris lumbricoides*, *Trichuris trichura* and hookworm, collectively referred to as soil-transmitted helminths, are the most common intestinal parasites[5]. On the global level, *Ascaris lumbricoides* infect 1,450 million; hookworms 1,300 million, *Trichuris trichiura* 1,050 million people worldwide respectively, while schistosomiasis affects over 200 million people[12].

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Approximately 300 million people are severely ill with these worms and of these, at least 50% are school-age children[21]. Beyrer *et al*[6]., also placed on record that approximately 0.807-1.221 billion humans have ascariasis, 604-795 million have trichuriasis, and 576-740 million have hookworm infections worldwide. According to Tadesse and Endeshaw[20], studies have shown that human intestinal parasite infections are endemic and widely distributed in subtropical and tropical regions and affect various segments of the population. Human intestinal parasitic infections do not receive any serious attention due to the general ignorance on the mode of transmission of parasitic diseases caused by intestinal helminth[12]. However, there is little information on the prevalence of intestinal helminth parasites among undergraduate students. Against this background, this study is carried out to determine the prevalence of intestinal helminth parasites among undergraduate students residing in hostels in The Federal University of Technology, Akure, Nigeria.

MATERIALS AND METHODS

Study area and study population

Study was carried out from July-August 2015 to assess the prevalence of human intestinal helminthiasis among students residing on campus in The Federal University of Technology, (Longitude 50E and Latitude 70N) located in Akure, the capital town of Ondo state, Nigeria. The population understudy were undergraduate students living in the six hostels within the university campus. The University management provides standard toilet facilities and pipe borne water in all the hostels. Wastes are adequately disposed off by the University Works Department. The University has a Health Centre adequate enough to cope with all health matters.

Informed Concept/Conflict of Interest

The result obtained on stool examination during a practical class in parasitology informed this study. Student participants were adequately informed of the study purposeand that information will be confidentially treated. Hence student's participation was voluntary as participants were all eager to know if they were infected with one helminth or the other.

Collection and Parasitological examination of faecal samples

Numbered questionnairescontaining demographic and socio-economic information were administered to each participant. The method of Cheesbrough[8] was used. Students were given numbered specimen bottles and were told to place about 10gm of freshly voided stool samples in the bottles. A total of 200 faecal samples were respectively collected and examined for the presence of helminth larvae or ova following theformal-ether concentration technique described by Mutapi *et al*[14]. The analysis was carried out in the Microbiological laboratory of The Federal University of Technology Akure. Standard parasitological monograph[13] was used to identify the various parasite larvae and ova in the faecal samples under x10 and x40 objective lens. Data obtained were subjected to descriptive analysis and Chi-Square Tests using statistical package for social sciences (SPSS) software version 17 (Microsoft Corporation, USA) at level of significance ($P<0.05$).

RESULTS

The prevalence of helminth ova in the faecal samples of the students is shown in Table 1. The overall prevalence of these helminth parasite eggs was 48.00%. The prevalence of ova was statistically different in the stool samples ($P<0.05$). Human intestinal helminth parasites encountered by their respective prevalence are: *Ascaris lumbricoides* (22.5%), Hook worm species (7.0%), *Trichuris trichura* (11.5%), *Strongyloides stercoralis* (5.0%) and *Taenia* spp. (2.0%).

The gender related prevalence of human intestinal helminth parasite encountered show that there was no significant difference in prevalence between male and female students ($\chi^2 = 2.003, df = 1,\ P = 0.05 < 0.157$). However, prevalence of *Ascaris lumbricoides* was high in female students (27.0%) than the male students (18.0%), infection with *Trichuris trichura* was high in male students (13.0%) than in female students (10.0%). Females were more infected with hook worm species (9.0%) while *Strongyloides stercoralis* infection was high (6.0%) in males. The overall gender related prevalence of intestinal helminth infection was found to be high in female students (53.0) compared with the male students (43.0%).

Age base prevalence show that there was no significant difference between distribution of helminth infections and the different age group of the students ($\chi^2 = 5.696,\ df = 5,\ P = 0.05 > 0.337$). However, the overall (total) prevalence in the age group 23-26 years old was 40.0% and 8.0% in the14-18 years old. High prevalence of 46.51% and 37.74% was respectively observed in both male and female students of the age group 23-26 years old. Similarly, low prevalence of 6.97% and 9.43% was respectively observed in the 14-18years old male and female.

Table 1: Overall prevalence of human intestinal helminth parasites

Ova of Parasites Identified	Number of Students Examined	Number of Students Infected	Prevalence (%)
Ascaris lumbricoides	200	45	22.5
Trichuris trichura	200	23	11.5
Hook worm species	200	14	7.0
Strongyloides stercoralis	200	10	5.0
Taenia species	200	04	2.0
Total	**200**	**96**	**48**

Table 2: Gender-based prevalence of human intestinal helminth parasites (N= 200)

Ova of parasite identified	Male (n_1=100)/ infection rate (%)	Female (n_2=100)/ infection rate (%)	Total number infected	Prevalence (%)
Ascaris lumbricoides	18(18.00)	27(27.00)	45	22.5
Trichuris trichura	13(13.00)	10(10.00)	23	11.5
Hook worm species	05(5.00)	09(9.00)	14	7.0
Strongyloides stercoralis	06(6.00)	04(4.00)	10	5.0
Taenia species	01(1.00)	03(3.00)	04	2.0
Total	**43(43)**	**53(53)**	**96(48)**	

n_1= Number of Male examined, **n_2 =** Number of Female examined, **N =** Total number examined

Table 3: Age-based prevalence of human intestinal helminth parasites

Age	MALE		FEMALE		TOTAL	
Group (years)	Number Examined	Infection Rate (%)	Number Examined	Infection Rate (%)	Number Examined	Infection Rate (%)
14-18	09	03(6.97)	07	05(9.43)	16	08
19-22	27	12(27.90)	28	18(33.96)	55	30
23-26	46	20(46.51)	45	20(37.74)	91	40
27-30	18	08(18.60)	20	10(18.87)	38	18
TOTAL	100	43	100	53	200	96 (48.0%)

DISCUSSION

Intestinal helminth parasite infections remain a silent menace and widespread chronic human infections among various strata of our society today. This study revealed high prevalence of intestinal helminth parasite infection among the undergraduate students living in hostels within the campus of The Federal University of Technology, Akure. The unexpectedly high prevalence of the infection could be attributed to unhygienic feeding habits such as eating unwashed contaminated fruits and leafy vegetables. The source of these fruits and vegetables is from the local farmers and fruit vendors from the adjourning villages around the university campus. The use of human wastes as manure, and promiscuous discharge of stool in farmyard cannot be overemphasized in these farmer populations. Fruits and vegetables like this when consumed directly without properly been washed could serve as vehicles for transmission of these human intestinal parasites. This observation agree with the those of Adedotun *et al*[1]., in Ogun State, southwest Nigeria, Nwoke *et al*[15]., and Egwunyenya *et al*[10]., in Jos who separately attributed high burden of intestinal helminth infection to pre-washed fresh leafy vegetables contaminated with eggs and larvae of parasitic roundworms and are offered for sale in major markets.

The prevalence of *Ascaris lumbricoides*, *Trichuris trichura*, in this study could be due the diverse adaptive features of their infective stages and the ubiquitous nature of its egg distributions ova[12]. The diverse adaptive features responsible for this high prevalence especially in the case *Ascaris lumbricoides*, has been ascribed the enormous capacity of the infective stages for with standing harsh environmental extreme conditions including desiccation and high pH to highly enriched embryonated eggs and an unsaponifiable lipid (ascaroside) inner layer[4,5,18.]

The observed high prevalence of intestinal helminth infection in males and females and in those of age 23-26 years old, though not statistically different (P= 0.05) could probably be attributed to dissimilar physiological habits, characteristic feeding habits, sanitary practices as well as exposure to different environmental conditions and transmission vehicles existing in and around the hostels. These factors favour helminth parasites physiological development and could aptly be connectedto their high endemicity[16,17]. Despite the high standard level of facilities (adequate health centre, waste disposal system, potable water and many others) provided in the hostels by the University management, findings in this study still revealed high prevalence of intestinal helminth parasites among the undergraduate students. Against this background, there is need to sensitise and educate the local vegetables and food vendors outside the university gate in order to prevent the spread of intestinal helminth infection in the study area.

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