Intestinal Helminthic Infection in Numan (Northeast Nigeria)

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ABSTRACT: Intestinal helminthes are the most common diseases in Sub-Saharan Africa with a very higher negative public health and socio-economic impacts. Mass drug administration is one program aimed at controlling the disease. The exercise has not been successful in Nigeria due to low levels of living standards, poor environmental sanitation, and ignorance of simple health-promoting behaviors. Due to negative impacts of helminthiasis, there is therefore the need for good preventive and control measures. This cannot be done effectively without a baseline data on the occurrence of helminthiasis in a particular area. A study of prevalence of intestinal helminthes infections among inhabitants of five villages in Numan local Government area Adamawa, Nigeria was carried out using formal-ether concentration method. Out of the 296 subjects examined, 27(9.1%) were found to be infected with at least one helminth. The prevalence of intestinal helminthes found were Taenia spp (3.7%), Hookworm (3.4%), and Ascaris lumbricoides (2.0%). There was no ignificant association between helminthic infection and sex (P>0.05). There was no significant association between prevalence and age (P>0.05). Teania spp had the highest prevalence among subjects examined. Prevalence and co- infection was highest in Salti village. Intestinal helminthes are of public health importance in the area, and control measures are imperative.

KEYWORDS: Intestinal helminthes, Prevalence, Numan, Ascaris lumbricoides, Hookworm, Taenia spp.

1. INTRODUCTION

Helminthes are the most common parasitic agents of man in developing countries, and produce diseases with a very higher negative public health and socio-economic impacts. The two major phyla of helminthes known to infect man include the nematodes (roundworms) including major intestinal helminthes and filarial worms; and the Platyhelminthes (flatworms) include the trematodes, such as the Schistosoma's and the tapeworms. It is estimated that approximately one-third of the almost three billion people that live on less than two $ dollars per day in developing regions of Sub-Saharan Africa, Asia, and the Americas are infected with one or more helminth [1]. The most common helminthiasis is those caused by infection with Ascaris lumbricoides, Trichuris trichuria and hookworm, followed by schistosomiasis and lymphatic filariasis.

The inhabitants of rural impoverished villages throughout the tropics and subtropics are often chronically infected with several different species of helminthes. Most of these infections if left untreated may result in chronic disorders with both concurrent and delayed pathology to the infected human host. Approximately 300 million people with heavy helminthic infections suffer from severe morbidity that results in more than 150,000 deaths annually [2]. In addition to their health, implications, helminthic infections also impair physical and mental growth in childhood and adolescents, thwart cognitive development, and hinder economic development.

In Nigeria, intestinal helminthes infections have continued to prevail because of low levels of living standards, poor environmental sanitation, and ignorance of simple health-promoting behaviors [3]. In view of the negative socio-economic impact of helminthiasis, there is therefore the need for the development of good preventive and control measures. This

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cannot be done effectively without a baseline data on the occurrence of helminthiasis in a particular area. The study was aimed at assessing the prevalence of intestinal helminthes infections in five villages of Numan local Government area of Adamawa, Nigeria.

2. MATERIALS AND METHODS

2.1 Study Area

The study was conducted in Salti, Nzumosu, Gbalapun, Byenti and Kodomti villages of Numan local Government area in Adamawa state, Northeastern Nigeria. The state lies between latitude 7° and 11° N of the equator and between longitude 11° and 14° east of the Greenwich meridian. The state is traversed by river Benue, river Gongola and river Yadzaran. The mean annual rainfall is 759mm in the north to 101mm in the south, August and September mark the peak of the rainfall. The average minimum and maximum temperature are 250C and 400C respectively. Occupation of the inhabitants includes farming, fishing and poultry and livestock keeping.

2.2 Stool Sample Collection

Labeled wide-mouthed plastic containers were given out to the randomly selected subjects and were instructed on how to obtain their stool samples without contamination. The specimen containers were collected the following morning from the subjects and the stool samples were immediately preserved with 10% formalin and taken to the laboratory for analysis.

2.3 Laboratory Examination Of Stool Samples

The stool samples were examined for the presence of helminthes using formal-ether concentration technique as described by [4]. One gram of stool was suspended in 10ml of 10% formaldehyde solution and mixed with applicator stick. The suspension was then passed through a funnel covered with a gauge, to remove debris into a bigger tube. 3ml of ether was added into the tube and capped. The suspension was then shaken to get a thorough mixture. The mixture was then transferred into centrifuge tube and centrifuge for 3 minutes at 4000rpm. An applicator stick was used to unplug the characteristic layer in the centrifuge tube, and the tube was inverted quickly and carefully to dispose the content living the sediments. The sediments were then examined by putting a drop on clean grease free glass slide, covered with cover slip under a microscope using 10x and 40x objectives for the presence of parasites.

2.4 Statistical Analysis

The data obtained in the study were presented in tables expressed in percentage and analyzed with respect to age, sex and villages. Chi- square was used to determine the significance of the differences in prevalence.

2.5 Ethical Consideration

The objective and method of the study were explained to the communities in a series of meetings with their community leaders and full informed consent was obtained.

3. RESULTS

A total of 296 subjects were recruited for the study of which 27(9.1%) were positive for at least one of the helminthes detected. Prevalence of helminthic infection in relation to age showed that subject within the age group <20 years of age had the highest prevalence (10.7%). This was followed by age group 20-39 years (9.7%), 40-69 years (7.7%) and age group $\geq$ 70 years had zero prevalence. However, the prevalence of helminthic infection in relation to age shows no significant difference ($x2 = 3.39$; P> 0.05), but increases with increase in age (Table 1).

The prevalence of helminthes by age was higher in the males (10.1%) than in the females (8.2%) Table2. There was however no significant difference in infection between males and females ($x2=0.610$; P> 0.05).

Table 3 depicts the frequency of occurrence of Intestinal helminthes in 27 subjects with infection. A total of 32(10.8%) parasites belonging to three helminthes species were detected as Ascaris lumbricoides, Hookworm and Taenia spp. Prevalence of helminthes species found in positive stool samples shows that Taenia spp was the most predominant (3.7%). This was followed by Hookworm (3.4%), and Ascaris lumbricoides (2.0%) respectively.

Prevalence by villages as depicted in Table 3 shows that Salti village had the highest prevalence (24.0%), This is followed by Gbalapun (12.3%), Kodomti (8.3%), Nzumosu (6.7%), Byemti (4.9%) respectively. There was an overall prevalence of coinfection of 1.7% (n=5). The prevalence was highest in Salti (4.0%), and lowest in Gbalapun (1.5%). Prevalence of co-infection was zero in Byemti village.

Table 1. Prevalence of intestinal helminthes infections by age

Age (years)	No. Examined	No. Infected	% Infected
<20	131	14	10.7
20-39	108	10	9.7
40-69	23	3	7.7
≥70	39	0	0.0
Total	296	27	9.1

Table 2. Prevalence of intestinal helminthes infections by sex

Sex	No. Examined	No. Infected	% Infected
Male	138	14	10.1
Female	158	13	8.2
Total	296	27	9.1

Table 3. Prevalence of intestinal helminthes infections by villages

Villages	No. exam.	A. inf. (%)	H. inf. (%)	T. inf. (%)	CI inf. (%)	To inf. (%)
Byemti	61	0(0.0)	3(4.9)	0(0.0)	0(0.0)	3(4.9)
Gbalapun	65	2(3.1)	2(3.1)	3(4.6)	1(1.5)	8(12.3)
Kodomti	60	0(0.0)	2(3.3)	2(3.3)	1(1.7)	5(8.3)
Nzumosu	60	0(0.0)	2(3.3)	1(1.7)	1(1.7)	4(6.7)
Salti	50	4(8.0)	1(2.0)	5(10.0)	2(4.0)	12(24.0)
Total	296	6(2.0)	10(3.4)	11(3.7)	5(1.7)	32(10.8)

Key: No. exam= number examined, Inf. = Infected, A= *Ascaris lumbricoides*, H= Hookworm, T= Taenia spp, CI= Co-infection, T= Total.

4. DISCUSSION

The prevalence of helminthes infections among different population is a function of environmental, parasitic, and host factors. This study revealed an overall prevalence of 9.1%. This is however higher than what was previously reported by [5] in Adamawa, who documented 43.0% prevalence value among students of post-primary institution. Our findings are also contrary to what was obtained by [6] who reported a prevalence of 33.3% in Adamawa.

Our findings are also contrary to what was obtained in other part of Northern Nigeria. Among such studies are those of [7], who documented a total prevalence of 43.2% in Agaie, Niger state, and [8] who recorded a total prevalence of 67.1% in Gwagwada, Kaduna. Finding of this study was however in consonance with the report of [9] in Edda South eastern Nigeria who documented a total prevalence of 10.7%.

There was no significant association in infection between sexes, male shows higher level of exposure to infection, than their female counterpart. This had corroborated the reports of [10] and [8]. This report was however contrary to the report of [11] and [12], (2009) who reported higher prevalence in females than in males.

In this study prevalence of intestinal helminthes infections by villages have shown that Salti village had the highest and lowest prevalence was recorded in Byemti village. Co-infection was also higher in Salti village, but the prevalence of coinfection was low compared to that reported by [7]. Taenia spp are the predominant helminthes. This is attributable to the high consumption of pork meat in the area.

5. CONCLUSION

Taeniasis was very common among subjects of the five villages studied. Age and sex had no association with prevalence of helminthes infections. Prevalence rate decreases as the age of the subjects studied increases. Helminthic infections was still a public health issue in the area, therefore control measure is quite imperative. This can be achieved through sanitary disposal of feaces, proper sewage disposal to avoid contamination of source of drinking water from contaminated human sewage and thorough cooking of meat (beef and pork) and vegetables before consumption. This is because Taenia eggs are highly resistant and can withstand many months of environmental exposure over a broad temperature range.

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