PREVALENCE OF HOOKWORM INFECTION AMONG PATIENTS ATTENDING AMINU KANO TEACHING HOSPITAL KANO, NIGERIA

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ABSTRACT
Prevalence rate of hookworm infection among patients attending Aminu Kano Teaching Hospital (AKTH) Kano, Nigeria was determined between September and November 2009. The procedure involved collecting and processing of stool samples in accordance with standard parasitological techniques. Out of 577 samples collected and processed, 50 (8.7%) were positive for hookworm infection with a peak in those subjects in the age group 21– 30 years (3.3%), followed by 51– 60 years (1.6%) and then 31 – 40 years (1.3%). No case of infection was detected among patients of 71 years and above. This study showed that the prevalence of infection was higher among females (5.7%) than males (3.0%), and significant difference exists in the rate of infection between the two sexes at P = 0.05. The above prevalence rate of infection could become higher in years to come and therefore become more threatening due to increase in birth rate and other socio-economic factors. Consequently, it is suggested that laying emphasis on personal and community hygiene can be achieved through promoting health education in addition to early diagnosis and treatment of the infection will go a long way in checking the spread of this infection in our community especially as it causes maternal death.

Keywords: Community health, hookworm, hospital, infection, Kano Keywords: Herbalism, Phytoch Phytochemicals, Scent, Benin

INTRODUCTION

Hookworm is a parasitic nematode that lives in the small intestine of its host, which may be a mammal such as dog, cat or human (Markell *et al.*, 2006). Two species of hookworm commonly infect humans, *Ancylostoma dueodenale* and *Necator americanus*. Hookworms are thought to infect more than 600 million people world wide. Both *A. duodenalis* and *N. americanus* are found in Africa, Asia and America (Markell *et al.*, 2006). Infection by hookworm is the second most common human helminth infection after ascariasis. In contrast to most intestinal helminthiasis, where the heaviest parasitic loads tend to occur in children, hookworm prevalence and intensity can be higher among adult males. Indeed, in most endemic areas Hotez *et al.* (2005) reported that adult women are the most severely affected by anaemia, mainly due to their much higher need for iron as a result of menstruation and repeated pregnancy in addition to the fact that customarily they have access to much poorer food than men. Hotez *et al.* (2005) added that majority of the infected individuals live in poverty-stricken areas with poor sanitation.

Although this infection is rarely fatal, but anaemia can be significant in heavily infected individuals, thus Gyorkos *et al.* (2006) reported that 56% of all pregnant women in developing countries are suffering from anaemia out of which 20% of all maternal deaths are either directly or indirectly related to anaemia.

The infection of the host is caused by the larvae and not the eggs, caused by walking bare footed through areas contaminated with faecal matter (Hawdon and Hotez, 1996). This kind of infection has been recognised as one of the leading causes of child morbidity in the developing countries of the tropics and sub-tropics. Hence, in susceptible children this infection affects their intellectual cognitive and causes growth retardation; intra-uterine growth retardation (IUGR), prematurity and low birth weight (LBW) among new borns in infected mothers are also associated by this kind of infection (Markell *et al.*, 2006).

Since determining prevalence rate of a disease is an important information that can be used in sensitizing government and other stakeholders interested in disease prevention and control towards taking appropriate measures before the situation goes out of hand, this study was conducted with the view to determining the prevalence of hookworm infection among the patients attending Aminu Kano Teaching Hospital by screening them for the presence of eggs of the hookworms through microscopic stool sample analysis.

MATERIALS AND METHODS
Study Area

The study area was Aminu Kano Teaching Hospital (AKTH), located along Zaria Road, Tarauni Local Government Area, Kano State, Nigeria. The predominant tribes attending the hospital are Hausa-Fulani with other tribes like Yoruba, Igbo, Kanuri, and other minority tribes that live within and outside Kano. The importance of this hospital is so enormous as a number of the patients come on referral in addition to those that attend the out patient unit.

Kano State is located on latitude $12^o09'$ N and longitude $7^o41'$ S of the equator (Antwi, 1991). According to National Population Commission (2007) the population of Kano during the 2006 National Population Census was 2163225, with 964889 males and 1198336 females. Kano is within the savannah region of Nigeria, with rainy season usually from May to October and the cold dry season is within the months of November to April (Oyeyi *et. al.*, 2009).

Sample Collection
Five hundred and seventy seven (577) samples were collected and analysed from patients on the basis of clinical information written on the patients' Laboratory Request Form issued by Consultants between 14th September and 13th November 2009. Fresh stool sample for hookworm screening was collected from each of the patients in a dry, clean, leak proof and sterilized sample container, while making sure that no urine, water, soil or other contaminants get into the container. The fresh stool samples were processed and examined microscopically (Cheesbrough, 2005).

Microscopy and Identification
The faecal samples were processed and examined for the presence of the hookworm eggs. Microscopic examination of the stool samples was done by direct saline preparation for ova and cysts (Cheesbrough, 2005). On a microscope slide, emulsified small stool specimen was added on to a normal saline (sodium chloride 0.9 w/v) and on one edge of the side cover slip was carefully placed on the suspensions avoiding over floating and air bubbles. The samples were microscopically examined, identified and confirmed using x10 and x40 objective lenses (Cheesbrough, 2005).

Statistical Analysis
The data generated was analysed for significant difference between the rate of hookworm infection recorded between males and females tested during the study using Chi-square test as described by Mukhtar (2003).

RESULTS AND DISCUSSION
Table 1 shows the summary of the results obtained during this study. The result indicated that out of 577 patients examined, 50 (8.6%) were infected by the hookworm, with 17 (3.0%) being males and 33 (5.7%) being females and significant difference exists in the rate of infection between the two sexes (P = 0.05). The higher prevalence found among the females could be due to the fact that they are normally involved more in household activities such as food preparation, cleaning of surroundings and water fetching in which they work barefooted, thus possibly stepping on areas contaminated with faecal matter containing the larvae (Hawdon and Hotez, 1996;

Adeyeba and Essiet, 2001). Similarly, the higher prevalence rate of 3.3% recorded among patients between 21 – 30 years could probably be due to their higher involvement with the above activities and therefore they became more at risk of infection by the disease. Moreover, the complete absence of infection from among patients of 71 and above years and only 0.2% from those between 0 – 10 years could be attributed to their old age and tender age respectively, and hence their non-participatory manner on the above risk factors that normally expose individuals to the hookworm infection. In addition, the observation that adult women between 21 – 70 years had higher prevalence rate of this infection in this study of 0.3 – 2.4% as against their male counterparts in the same age group with 0.2 – 0.9% only, further upheld the report of Hotez *et al.* (2005) that says adult women are the most severely affected by anaemia in most endemic areas due to their much higher needs for iron because of menstruation, repeated pregnancy and the fact that they get poorer food than men (Bethony *et al.*, 2006), which can be directly related to over dependence of most of them on men for their daily needs.

Comparing this prevalence rate with what was obtained in similar studies else where such as Darjeeling, India with 42.8% (Pal *et al.*, 2007), Hoabinh, North western Vietnam with 52% prevalence out of 526 tested households tested (Verle *et al.*, 2003), Xiulongkan village, China with 60% infection rate (Gandhi *et al.*, 2001) and Minas Gerais, Brazil with 62.8% as reported by Fleming *et al.* (2006), one can say that the prevalence rate of 8.7% found in this study is relatively very low. This can be attributed to the fact that the hospital is city–based, where a significant number of those patronizing it have better awareness compared to those in the rural areas although some of the cases could be referral type from other hospitals. It should however be noted that the above prevalence rate could be different if the study was extended to cover rainy season.

CONCLUSION AND RECOMMENDATIONS
The above prevalence rate of infection is low but could become higher and more threatening in the future due to increase in birth rate and continued deterioration in other socio-economic factors, such as .lack of quality food that is sometimes associated with poverty, which is common among most Nigerians and especially when walking in poor hygienic environment bare footed. Consequently, it was suggested that laying emphasis on personal and community hygiene can be achieved through promoting health education in addition to early diagnosis and treatment of the infection especially among pregnant women, will go a long way in checking the spread of this infection in our community especially due to its devastating effect in causing maternal death.

Table 1: Prevalence of Hookworm Infection Among Patients Attending Aminu Kano Teaching Hospital by Age and Sex

Age (yrs.)	Sex	Number Examined	Number Infected	Infection (%) (by sex)	Sub-total
0 – 10	M	56	1	0.2	01 (0.2)*
	F	56	0	0.0	
11 – 20	M	87	3	0.5	06 (1.0)
	F	69	3	0.5	
21 – 30	M	107	5	0.9	19 (3.3)
	F	65	14	2.4	
31 – 40	M	51	2	0.3	08 (1.3)
	F	31	6	1.0	
41 – 50	M	15	1	0.2	03 (0.5)
	F	7	2	0.3	
51 – 60	M	12	4	0.7	09 (1.6)
	F	8	5	0.9	
61 – 70	M	3	1	0.2	04 (0.7)
	F	3	3	0.5	
71 – 80	M	1	0	0.0	00 (0.0)
	F	2	0	0.0	
81 – 90	M	3	0	0.0	00 (0.0)
	F	1	0	0.0	
S/total	**M**	**335**	**17**	**3.0**	
	F	**242**	**33**	**5.7**	
G/ total		**577**	**50**	**8.7**	50 (8.7)

*Values in parentheses are percentages
Key: M = male, F = female

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