

## PREVALENCE OF INTESTINAL HELMINTHES AMONG PRIMARY SCHOOL CHILDREN IN BOSSO, NORTH CENTRAL NIGERIA

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### Abstract

**Introduction:** This study investigated the prevalence of intestinal helminthes among primary school children of Bosso Town, North Central Nigeria.

**Materials and Methods:** Fecal samples from 250 pupils were examined microscopically using formol ether concentration technique.

**Result:** Out of the total 250 samples analyzed, 115 (46%) were found to be infected. The breakdown of the prevalence of helminthes infection showed that *Ascaris lumbricoides* had 41(16.4%) followed by *Strongyloides stercoralis* 36(14.4%) as well as Hookworm 22(0.09%), and *Trichuris trichuria* 16(0.07%). Single species infection was seen in 78(67.8%) of the infected children while 47(40.9%) had mixed infections. The prevalence of infection peaked in the age group (9-10) years in both male (53.5%) and female (46.3%) respectively.

**Conclusion:** The high prevalence recorded was found to be related to poverty, ignorance and poor environmental sanitation.

**Keywords:** intestinal helminthes; *Ascaris lumbricoides*; *Strongyloides stercoralis*

### 1. Introduction

Parasitic diseases are common in the developing countries and constitute a major public health challenge because of their high prevalence rate and their effect on both nutritional and immune status of the population<sup>1</sup>. In Africa, infection with parasitic helminthes is often recognized as one of the important public health problems, because in a world of 2,200 million of inhabitants; there existed 2,000 million helminthes infections with about 15 million Nigerians suffering from Ascariasis alone while there are several thousand with Strongyloidiasis, trichiuriasis, enterobiasis, hookworm and tapeworm infections<sup>2</sup>. Among the parasitic infections, helminthes infections are the most common in the northern part of Nigeria<sup>3</sup>. Helminthiasis can have immuno-modulatory effects on the host<sup>4</sup> with implications for any co-infecting pathogens. Helminthiasis are common in

regions where poverty and poor sanitary conditions prevail. Under such circumstances the incident rates may reach 90%<sup>5</sup>. Poor hygienic living conditions give rise to helminthes infections in children, with the prevalence of such infections being an excellent indicator of socio-economic status. Among the effects associated with these parasites are growth retardation, intestinal obstruction, hepatic and biliary diseases, impaired cognitive development, and nutritional effects such as iron deficiency anemia. Intestinal parasites are transmitted through the contamination of water, soil, and food by feces, a direct consequence of poor hygienic and living conditions<sup>6</sup>. Intestinal Helminthiasis are known to affect the health and academic performance of children in developing countries<sup>6</sup>. Young children pay heavily for some of the less well-known diseases, including infection with one or more of the soil-transmitted

helminthes (STHs): *Ascaris lumbricoides* (roundworm), *Trichuris trichuria* (whipworm), and *Ancylostoma duodenale/Necator americanus* (hookworms).

The poor sanitation/hygiene, lack of portable water, poverty and the ignorance in which the people live their lives predispose children in the study area to helminthes infections. There is therefore a need for a consistent investigation of cases regularly as a basis for credible intervention programmes, hence this study to evaluate the level of helminthes infection and the epidemiological factors among the primary school children in Bosso community.

## 2. Materials and Methods:

**2.1 Study Area:** The study area comprises of primary schools in Tundun-Fulani, Maikunkele, Rafin Yashi, and Bosso all in Bosso Local Government Area of Niger State, Nigeria.

**2.2 Study Population:** The study population comprises of randomly selected primary school children attending some selected primary school in the above-named areas. A total number of 250 pupils comprising of 135 males and 115 females attending primary 3-6 and aged between 8-12 years were selected for this study. Informed consent was obtained from the parents of wards through the school managements.

**2.3 Sample Collection:** Stool samples were collected from the subjects in a clean screwed capped container. Each sample

was labeled appropriately and then transferred to the laboratory immediately for analysis.

**2.4 Preparation of Sample:** Formol ether concentration technique was employed and the helminthes eggs, cyst, larvae observed were then identified with the aid of a chart<sup>7</sup>.

**2.5 Statistical Analysis:** The data obtained were analyzed using chi-square to determine if there is a significant difference between the infected male and infected female.

## 3. Results:

In this study, 250 primary school children comprising of 135 males and 115 females were investigated for infection with helminthes. In all, 115 (46%) subjects were found to be infected. *Ascaris lumbricoides* had the highest prevalence rate (16.4%), followed by *Strongyloides stercoralis* (14.4%), Hookworm (0.09%) and *Trichuris trichuria* (0.06%). Total prevalence rates of 47.8% and 52.1% were observed for males and females respectively (table 1).

Single species infection was seen in 78 (67.8%) of the infected children, whereas 47(40.9%) were co-infected with two or more species of helminthes.

The prevalence rates of infection in both male and females peaked in the age group (8-10) years with 53.5% and 46.3% respectively.

The distribution of infection in the four selected primary schools in relation to Sex and Age is shown in Tables 2-5 below.

**Table 1. Helminthes observed in this study with their percentage frequency**

Intestinal helminth	Percentage of infection
<i>Ascaris lumbricoides</i>	41(16.4%)
<i>Strongyloides stercoralis</i>	36(14.4%)
<i>Trichuris trichuria</i>	16(0.06%)
Hookworms	22(0.09%)

**Table 2. Prevalence of intestinal helminthes in relation to sex and age in Babandabo primary school, Maikunkele.**

Age range	No of male examined	No of male infected	% of infection	No of female examined	No of female infected	% of infection
8-10	18	11	61.1	17	8	47.1
10-12	12	5	41.7	15	6	40.0
Total	30	16	53.3	32	14	43.8

**Table 3. Prevalence of intestinal helminthes in relation to sex and age in UBE primary school, Rafin-yashi.**

Age range	No of male examined	No of male infected	% of infection	No of female examined	No of female infected	% of infection
8-10	16	8	50.0	18	13	72.2
10-12	17	5	29.4	15	6	40.0
Total	33	13	39.4	33	19	57.6

**Table 4. Prevalence of intestinal helminthes in relation to sex and age in Model primary school, Tundun-fulani.**

Age range	No of male examined	No of male infected	% of infection	No of female examined	No of female infected	% of infection
8-10	22	9	40.9	13	6	46.2
10-12	13	5	38.5	13	7	53.8
Total	35	14	40.0	26	13	50.0

**Table 5. Prevalence of intestinal helminthes in relation to sex and age in Madrasatul Hayatul Islam primary, Bosso.**

Age range	No of male examined	No of male infected	% of infection	No of female examined	No of female infected	% of infection
8-10	21	10	47.6	14	6	42.9
10-12	16	7	43.6	10	3	30.0
Total	37	17	45.9	24	9	37.58

#### 4. Discussion:

In this present study, 115 (46%) out of the 250 primary school children surveyed were found to be positive for intestinal helminthes. The relatively high prevalence of helminthes (46%) observed in this study agrees with the findings of previous studies in parts of Northern Nigeria<sup>8, 9</sup>. This finding is also consistent with the report<sup>10</sup> that other parts of tropical Africa have shown very high (>70%) infection rates of intestinal helminthes. Poverty, illiteracy, poor hygiene and lack of access

to potable water have been advanced as the possible factors responsible for the endemicity of intestinal parasitic infections in most part of Africa and developing nations.

*Ascaris lumbricoides* had the highest prevalence of (16.4%), followed in descending order by *Strongyloides stercoralis* (14.4%), Hookworm (0.09%), *Trichuris trichuria* (0.06%). This result is consistent with the reports of earlier studies<sup>11, 12, 8, 13</sup> that these parasites particularly *Ascaris lumbricoides*,

*Strongyloides stercoralis* as well as Hookworm are common throughout much of Nigeria. Contrary to the findings of a study<sup>14</sup> in southwest Nigeria in which *S. stercoralis* was identified as the most prevalent, *Ascaris lumbricoides* had the highest prevalent rate in this study. These observed variations in the prevalence rate of intestinal helminthiasis from different rural communities may be factors such as climate, standard of personal and environmental hygiene which may either favor or discourage the distribution of individual parasites.

Single species infection was seen in 78(67.8%) of the infected children while 47(40.9%) were co-infected with either two or more species of helminthes parasites. The relatively high level of infection observed in this study suggests the endemicity of the parasites which makes transmission quite easy and thus re-infection and co-infection with multiple parasites possible.

The prevalence of infection peaked in the age group (8-10) years in both males and females with (53.5%) and (46.3%) respectively. There was no significant difference between the infected children in relation to age and sex except in Model primary school in Tundun Fulani.

This present investigation on intestinal helminthiasis indicates that *Ascaris lumbricoides*, *Strongyloides stercoralis*, as well as Hookworm were more prevalent among the primary school children in Bosso community. and majority of these children with helminthes infections were from low socioeconomic group, with concomitant low hygiene practices and lack of portable water supply. Most of these children come from low income family with poor environmental sanitation and poor or no access to portable water for drinking and domestic use. These children depend on stream water and shallow well of low quality level as sources of drinking and domestic use. Most children from these communities based on lack of parental care spend most of their leisure

time swimming, fishing and roaming about bare-footed. All of these are the factors predisposing the children of this community to helminthes infection.

### Conclusion.

The present study reveals that intestinal helminthes are abundant among the primary school children of Bosso community. This situation strongly calls for the institution of control measures, including treatment of infected individuals, improvement of sanitation practices, and provision of clean water. It is recommended that the Federal and State Environmental Sanitation Programs should encourage personal and environmental hygiene throughout the nation through awareness campaigns.

### References.

1. Adeyeba O.A. and Akinlabi A.M. (2002). Intestinal parasitic infections among school Children in a rural community, southwest Nigeria. *Nigerian Journal on Parasitology*. 23:11-18.
2. Abanobi O.C., Anosike J.C. and Dada E.A. (2000). A study on the intestinal worms (Helminthiasis) Infestation in a central Nigeria rural community. *Journal of Applied science in Environmental Management*. Volume.10 (2), pp 61-66.
3. Awolaja. A., Akinboye, D.O. and Agbolade O.M, (2004). Intestinal helminthiasis and Urinary schistosomiasis in some villages of ijebu North. *Africa Journal of Biotechnology*. Volume3 (3), pp.206-209.
4. Van Riet (2007). Chronic helminthes infections induce immunomodulation: consequences and mechanisms. *Immunobiology*, 212(6):475-9
5. Maya-Redon C., Jimenez-Cisneroz B.E. (2007). Helminthes and Sanitation. *Communicating Current Research and Educational Topics and Trends in Applied Microbiology* 8: 71.

6. Dar P.A., Ahmad F., Zargar S.A., Amin A., Dar Z.A. and Wani S.A. (2010). Intestinal helminthiasis in children of Gurez valley of Jammu and Kashmir State. *India Journal of Global Infectious Diseases* 2:91-94.
7. Cheesbrough M. (2005a). "District Laboratory practice in tropical countries" Part 1 second edition, Cambridge University Press, Cambridge CB2 2RU, U.K. pp 214.
8. Kogi, E., Umoh, J. U. and Vajime, C.J. (1991). Intestinal parasites and gastroenteritis among patients attending the University Clinic, Samaru Zaria, Nigeria. *The Nigerian journal on Parasitology* 12: 77 –80.
9. Alo, E. B., Anosike, J. C. and Danburan, J. B. (1993). A survey of intestinal helminthes Among students of post-primary institution in Adamawa State, Nigeria. *Applied Parasitology*, Volume 34, pp 1-7.
10. Dada, E. O., Adeiyongo., C. M., Anosike, J. C., Zaccheaus, V. O., Okoye, S. N. and Oti, E. E. (1993). Observations on the epidemiology of human taeniasis amongst the Goemai tribe of Northern Nigeria. *Applied Parasitology*. 34 (4): 23 –29.
11. Ogbe M.G. and Adu O.O. (1990). Intestinal helminthiasis in an orphanage in Nigeria. *Bioscience Resources Communication* 2:105-118.
12. Ndifon, G. T. (1991). Human Helminthiasis in the Tiga Lake Basin, Kano, Nigeria. *The Nigerian Journal on Parasitology* 12: 81- 84.
13. Gundiri, M. A. And Akogun, O. B. (2000). Gastrointestinal and urinary parasitic infections amongst School children in Rumde, Yola. *The Nigerian Journal on Parasitology* 21: 117 – 124
14. Kuka, S. A., Ajogi, I. and Umoh, J. U. (2002). Helminthiasis amongst primary school children in Lere L. G. A. kaduna State. *The Nigerian Journal l on Parasitology* 21: 109-116.