

Identifying an Effective Intervention Group for the Control of Intestinal Helminthes in Under-8 School Children in Ugep-Urban

Okoi Nta Obono¹; Etim John John²; Obasesam John³;
Aduloju Richard Akinola⁴ & Okonkwo Browne Chukwudi⁵:

¹Department of Family Medicine, University of Calabar Teaching Hospital

²Department of Public and Community Health, Novena University, Ogume, Delta State

³Department of Radiography and Radiological Sciences, University of Calabar

⁴Department of Dentistry, Novena University, Ogume, Delta State

⁵Department of Medicine, Novena University, Ogume, Delta State

Corresponding author: **Etim John John**

Abstract

The aim of this study was to identify an effective intervention group for the control of the intestinal helminthes infection among under-8 years old in Ugep-Urban. The study examined 650 stool samples of under-8 years old children from 6 government-owned primary schools in Ugep-Urban. The researchers used normal saline and iodine to analyze the stool samples and identified two (2) major intestinal helminthes: Ascaris lumbricoides and hookworm. The results of this study revealed that the newly enrolled under-8 years old children in government-owned schools were more infected with Ascaris lumbricoides and hookworm than those in the private owned nursery and primary schools. The study detected a significant difference in the prevalence of Ascaris lumbricoides and hookworm between the under-8 years children from government owned primary schools than those in private owned nursery and primary schools ($p < .001$). The study results therefore suggests that an appropriate deworming programme is needed for the newly enrolled under-6 years old children in the government owned primary schools in Ugep-Urban.

Keywords: Intestinal helminthes, Infection, Under-8 year old, 0-intervention, deworming programme.

Introduction

Intestinal helminthes infection is highly prevalent among school age children in both government owned and private owned primary schools.^{1,2} Recent studies have suggested that the worm load of the school children could represent the level of hygiene in the communities where those schools are found.^{1,3} From our experience, it was suggested that deworming of the school age children could contribute to the reduction in the intensity of helminthes infection of the untreated community.⁴

According to the Cross River State Ministry of Health, helminthes infection ranks fourth among the 10 most prevalent diseases in their outpatient services. Various helminthes studies in the State also revealed a high prevalence of helminthes infection among different populations in the past decade. However, no one has compared the worm load of the school age children in school of government owned primary schools and

private owned schools in Ugep-Urban. This study tried to find out such a relationship in both setting by testing the major helminthes infection among the school age children in Ugep-Urban. The aim therefore was to identify an effective intervention group for deworming the school children and the community.

Materials and Method

This study was conducted in 6 government owned primary schools and 3 private nursery and primary schools. Stool containers, normal saline and iodine were used. From the researchers' inspection of the schools, most of the government owned primary schools have no toilets and sanitary facilities. School children used the open field outside the school for defecation. More than half of the school age children did not wear sandals or shoes regularly to schools as compared to school children in private owned schools. The government official school age starts from 2 years old and above. The headmasters of the various schools' report concluded that, a significant proportion of under-8 years old children are enrolled into primary schools particularly in elementary one. School authorities also encourage headmasters to enroll under school age children into the primary schools.

Data Collection/ Analysis

A cross-sectional study was carried out. The researchers collected 1000 stool samples (650 from the 6 government owned primary schools and 350 from the private owned schools) in June 2018 and about 2 months after the school resumed. In the start of the first term, 360(36%) of the school age children were 4-5 years old, 450(45%) were 5-6 years old and 190(19%) were 7 – 8 years old.

For stool samples collection, the researchers informed the school children and their headmasters and proprietors of the procedure of the samples collection and provided stool containers with identity numbers. The following day, stool samples were collected and then obtained demographic data of the school children from the school register.

For the laboratory examination, the researchers used normal saline and iodine to analyze the stool samples in Ugep General Hospital laboratory. The researchers identified two major intestinal helminthes which are *Ascaris lumbricoides* and hookworm. It took the researchers two weeks to analyze the stool samples in the laboratory.

Data entry and statistical analysis was performed using the SPSS version 20 and Chi-square test were performed to test for the significance of helminthes infection between the government owned primary schools and the private owned schools at 95% significant level.

Results

In the 9 schools, the mean age of the 1000 children was 6.3 years old. 650(65%) were males and 350(35%) were females. On average 306(30.6%) of the children in government owned primary school were infected with one or more intestinal helminthes and 103(10.3%) in the private owned schools. The prevalence of at least one of the two major intestinal helminthes was significantly different between the government owned primary schools and private owned primary schools as shown in Table 1 ($P < 0.05$). No difference was detected between male and female children in both groups.

Table 2 shows that the under-8 years old school children were more infected with one or two of the major helminthes in government owned schools than those in private owned schools. The same table shows a significant difference in the prevalence of *A. Lumbricoids* and hookworm between the under-8 years old children in the government owned schools and those in the private owned schools ($P < 0.05$)

Discussion

In this study, we found a significant difference in the rate of infections between the under-8 year old children in the government owned schools and those in the private owned schools. The prevalence of at least one of the two major intestinal helminthes was higher among the first grade children (4 – 6 years old) in government owned schools than those in private owned schools. This is because of the high level of hygiene in private owned schools than in government owned schools.

Previous studies reported that pre-school children under-8 years old have the highest intensity of *A. lumbricoides* and hookworm.⁵ However, this study supported the fact by showing clearly that these pre-school children were infected with helminthes while at school and not at home because of poor hygiene, with open defecation in the government owned schools. This could cause the helminthes infections to pass from one student to another. This finding also agreed with Olsen observation that the school environment is a place for the transmission of intestinal helminth.⁵

Warren et al also stated that re-infection rates tend to be higher in school children than at home or in the community.² In our study area, the under-8 years old children usually stay at home looking after their young ones after school hours, while their parents go to farm. This further supports Olsen observation that the school environment is a place for the transmission of intestinal helminthes.

Conclusion and Recommendation

These results suggest that a deworming programme can be effective and is necessary for the school children, particularly the newly enrolled under-8 years old children in government owned primary school than at home or in the community. Therefore, local government and state government should promote the level of hygiene in primary schools by providing toilet facilities and pipe borne water. They should enact a law that all primary school children wear sandals to schools.

References

1. Bundy, D. A. P., Wong, M. S., Lewis, L. L., Hoeton, J. Control of geo-helminthes by delivery of targeted chemotherapy through schools. *Trans Roy Soc Trop Med Hyg* 1990; 84: 115 – 120.
2. Warren, K. S., Bundy, D. A. P., Anderson, R. M., et al. Helminth infection: In Jamison, D. T., Mosley, W. H., Measham, A. R. and Bobadila, J. L., eds. *Disease control priorities in Developing countries* London in oxford University Press, 1993; 131 – 160.
3. Guyatt, H. L., Brooker, S., Donnelly, C. A. Can prevalence of infection in school aged children be used as an index for assessing community prevalence? *Parasitology* 1999; 118: 257 – 268.
4. Partnership for child Development. *Community perception of school based delivery of ant-helminthes in Ghana and Tanzania.*
5. Olsen, A. Experience with school based interventions against soil transmitted helminthes and extension of coverage to non-enrolled children. *Acta Trop* 2003; 86: 255 – 266.
6. Rai, S. K., Nakanishi, M., Npadyay, M. P., et al. Effect of intestinal helminthes infection on some nutritional parameters among rural villagers in Nepal. *J. Med Sci* 1998; 44: 91 – 98.
7. Bundy, D. A. P. Control of Intestinal Nematode infections by chemotherapy: Mass treatment versus disgnostic screening. *Trans roy Soc Med Hyg* 1990; 84: 622 – 625.
8. Holland, C. V., Asaolu, S. O., Crompton, D. W. T., White-head, R. R., Coombs, I. Targeted anthelnurithuic treatment of school children: Effect of frequency of application on the intensity of ascaris lumbricoides infection in children from rural Nigeria villages, *Parasitology* 1996; 113, 87 – 95.
9. Beasley, N. M. R., Hall, A., Tomkins, A. M., et al. The health of enrolled and non enrolled children of school age in tanga, Tanzania. *Acta Trop* 2000; 76: 223 -229.

10. Olsen, A. The proportion of helminth infections in a community in Western Kenya which would be treated by mass chemotherapy of school children. *Trans Roy Soc Trop med Hyg* 1998; 92: 144 – 148.
11. School and community health project. Participatory baseline study of school and community health project. Kathmandu: new ERA and SCHP, 1997.

Table 1: Age distribution among the under-8 school age children in government owned schools and private owned schools (n=1000)

AGE GROUP (years)	Government schools	Private schools	p-value
4 – 5	36% (234)	36% (126)	<0.01
5 – 6	45% (292.5)	45% (157.5)	<0.05
7 – 8	19% (123.5)	19% (66.5)	<0.01
Total	100 (650)	100% (350)	

Table 2: Prevalence of major intestinal helminthes among under-8 years age group in government and private schools

Government schools n = 650	Primary schools n = 350	P - value
A. lumbricoides 93 (24.7%)	21 (6.0%)	<0.01
Hookworm 22 (5.9%)	15 (4.3%)	<0.01
Total 115 (30.6%)	36 (10.3%)	