Original Research Article

Incidence of Ascariasis among Primary School Pupils in two Communities of Kebbi State, Nigeria.

ABSTRACT

This study was carried out to determine the prevalence of Ascariasis among primary school pupils in Jega and Maiyama of Kebbi state, Nigeria. Four (400) stool samples were examined for ascaris infections using formal-ether concentration techniques. The result of this study revealed 11.75% prevalence of the parasite. There was no significant difference (P>0.05) between the prevalence of Ascariasis among pupils examined from various schools. Statistical analysis shows that the prevalence of the infection was associated with community (O.R = 1.55) and gender (O.R = 1.72). the result also shows that the infection increase with increase in age of the pupils. Improved sanitation, personal hygiene, deliberate policy for regular deworming of school children by the government will decrease the rate of ascariasis.

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Keywords: Ascariasis, Prevalence, pupils, Kebbi state, and Nigeria.

1.0 INTRODUCTION

Ascariasis is a parasitic disease caused by helminthes parasite *Ascaris lumbricoides* (Mamman and Maikenti, 2014). The parasite belongs to genus *Ascaris* of the phylum nematoda. Ascariasis is a common infection in children of tropical countries due to poor sanitation. It is, however, rare in adults. Infection is acquired via faecal-oral transmission through ingestion of food, water, or soil contaminated with embryonated eggs of the parasite (Gaash, 2004).

Ascaris lumbricoides infections in humans occur when an ingested infective egg releases a larval worm that penetrates the wall of the duodenum and enters the blood stream. From here, it is carried to the liver and heart, and enters pulmonary circulation to break free in the alveoli, where it grows and molts. In 3 weeks, the larvae pass from the respiratory system to be coughed up, swallowed, and thus returned to the small intestine, where they mature to adult male and female worms. Fertilization can now occur and the female produces as many as 200,000 eggs per day

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for a year. These fertilized eggs become infectious after two weeks in soil; they can persist in soil for 10 years or more (Murray *et-al*., 2005).

One billion people or 25% of the world's population harbour *A. lumbricoides*, making it the most prevalent helminthiasis of humans. It is usually a mild disease with relatively low morbidity and mortality rates. The high global prevalence of *Ascaris* ultimately results in 20,000 deaths per year, mainly due to intestinal obstruction (Chijoke *et al*., 2011).

The most prevalent and important helminthes in developing countries are the soil-transmitted helminthes such as: *Ascaris lumbricoides*, *Trichuris trachiura*, hookworms and *Hymenolepis nana* (Bunza and Abdullahi, 2013).

Ascaris lumbricoides have negative impacts on nutritional status, including decreased absorption of micronutrients, loss of appetite, weight loss and intestinal blood loss that can often result in anemia. They may also cause mental and physical disability, growth retardation in children, skin irritation around the anus and lethal complications if left untreated (Ashtiani *et al*., 2011). Research has been shown that the presence of 26 adult *Ascaris lumbricoides* worms in a child deprives as much as 1/10 (One tenth) of the total protein content of the child (Drake and Bundy, 2001).

Although several studies have been conducted on the distribution and prevalence of ascariasis in Nigeria, there are still several localities in the country for which epidemiological information of ascariasis are not available. Therefore, this study will provide data to assess prevalence of ascariasis and their importance in the health of the communities.

The aim of this research is to determine the prevalence of ascariasis among primary school pupils in some selected primary schools in Jega and Maiyama, Kebbi State.

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2.0 MATERIALS AND METHODS

2.1 Study Area

This study was carried out in Jega and Maiyama local government areas of Kebbi state. The area is located at latitude 13º north and longitude 5º east. The inhabitants are predominantly Hausa people by tribe. The major occupation of the people is farming and trading (Sulaiman, 2008). The area has annual rainfall between 500mm to 1300mm which starts from mid-may to mid-September with heavy concentration in the month of august. The wet season is followed by dry season which commences from September to April. The dry season is characterized by few or near absence of vegetation cover and no incidence of rainfall. Also, during the dry season, a short span temperature condition of cold harmattan (November to march) as well as the hot bazara period (March to May) occur (Suleiman, 2008).

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2.3 Study Population

The study population comprised of 400 primary school pupils. A total of 10 primary schools were randomly selected from Jega and Maiyama for this study using cluster sampling. The pupils enrolled were within the ages of 4-13 years.

2.4 Data Collection and Analysis

A structured questionnaire was administered to obtain information on demographic data. Faecal samples were collected from 400 pupils. Each pupil was given a sample collection bottle bearing serial number that was assigned to his/her name in the record book. The pupils were instructed on how to collect their stool sample into the containers between 7 and 10 am.

The faecal samples collected was preserved in 10% formalin and transported to the Zoology Laboratory in the Department of biological sciences, Faculty of science, Kebbi State University of Science and Technology, Aliero for analysis.

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2.5 Laboratory Analysis of Faecal Samples

Fecal analysis was carried out using formol-ether concentration technique as described by National committee for clinical laboratory standard (1997).

2.6 Identification of Parasites.

Identification of the intestinal parasites was done using the morphology of diagnostic stages of human intestinal parasites by Brook and Melvin (2001).

2.7 Data Analysis

The data collected for this study was analyze using Graph Pad Instat software version 3.05. The prevalence of different intestinal parasites was calculated and express in percentages. Chi square test was used to test the association between the prevalence of infection and schools. Odds ratio (OR) was used to determine the association between gender/age of the pupils and prevalence of infection. P-value ≤ 0.05 is considered significant.

RESULTS AND DISCUSSION

Table 1: Prevalence of Ascariasis in Ten Schools in Jega and Maiyama.

School	No exaimed	No positive (%)	Chi-square	D.F	P-value
Giwa Tazo	40	6(15.0)	**4.846**	**9**	**0.848**
Jega Model	40	3(7.5)			
MBD Maiyama	40	7(17.5)			
Nasarawa Pri sch	40	5(12.5)			
Nizamiya Pri Sch	40	5(12.5)			
Rauda Pri Sch	40	2(5.0)			
UBE Dumbegu	40	4(10.0)			
UBE Gindi	40	5(12.5)			
UBE Maiayama	40	6(15.0)			
UBE Mungadi	40	4(10.0)			
TOTAL	**400**	**47(11.75)**			

Table 2: Prevalence of the infection in the two Communities.

Community	No Examined	No Positive (%)	O.R	P-value
Maiyama	200	28(14.0)	**1.55**	**0.214**
Jega	200	19(9.5)		
TOTAL	**400**	**47(11.75)**		

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Table 3: Gender wise Prevalence of Ascariasis.

Gender	No Examined	No Positive (%)	O.R	P-value
Male	200	29(14.5)	**1.72**	**0.121**
Female	200	18(9.0)		
TOTAL	400	**47(11.75)**		

Table 4: Prevalence of the infection with respect to age of the pupils.

Age	No Examined	No Positive (%)	O.R	P-value
4 – 7 yrs	140	13(9.3)	**0.68**	**0.169**
8 – 11 yrs	120	13(10.8)	**0.88**	**0.426**
12 – 14 yrs	140	21(15.0)	**1.59**	**0.095**
TOTAL	**400**	**47(11.75)**		

Over the course of this study, 400 primary school pupils were examined for *Ascaris lumbricoides* infection out of which 47 were found positive. The result of this study revealed 11.75% prevalence. The result confirms the endemicity of Ascariasis in the study area. The prevalence was high compared to the findings of Mamman and Maikenti, (2013) with 6.17% in Akwanga, Nigeria and A prevalence of 1(0.2%) among school age children was recorded in Vom, Plateau State, Nigeria by (Dangana *et al.*, 2012). The relatively high prevalence of Ascariasis recorded in public schools could be attributed to the presence of much garbage around school compounds and the unhealthy conditions of latrines as recorded by (Uwem *et al.* (2008) The populations in developing countries live in conditions that are highly conducive to the acquisition of parasitic infection. Poor hygiene, crowded household conditions, dietary habits, education level of the community and deficient sanitation mark their day-to-day life (Culha *et al.*, 2007).

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Breakdown of result in relation to school showed that high prevalence of ascariasis was recorded Muhammad Bello Dumbegu primary school with 17.5% prevalence. Raudatus sunnah academy had the least prevalence with (5.0%) Table 1. These differences among the Schools were however not significant at 95% confidence level (P = 0.848).

Peak prevalence was recorded in Maiyama (14.0%) than Jega with a total positive cases of 19(9.5%) out of 200 (Table 2). Odds ratio value of 1.55 show that their positive association between community and the prevalence of ascariasis. This is attributable to the possible differences in community practices relating to infection and level of environmental contamination. Similar observation was made by Danladi *et al*., (2015). The distribution and prevalence of various species of intestinal parasites differ from region to region because of several environmental, social and geographical factors (Zahraa, 2010).

Table 3 depicts the prevalence of the infection with respect to gender of the pupils. The prevalence of Ascariasis among gender shows that the male pupils were more parasitized (14.5%) than the female pupils (9.0%). Despite positive association between gender and the prevalence of the infection (O.R = 1.75), the effect is not statistically significant (P = 0.214). This is in consonance with Elekwa and Ikeh, 1996. The reasons for this variation might be due to the fact that the male pupils do more of the activities which necessitate more contact and exposure to the parasite such as playing, swimming and fetching of water in streams.

The high prevalence of 15.0% and 10.8% was recorded among pupils within the age groups 12-14 and 8-11 respectively while the lowest prevalence (9.3%) was seen among age group 4-7. The result shows increase in prevalence of the infection with increase in age. The pupils within the age group 8-11 and 12-14 are more expose to the infective stage of the parasite than their

younger counterpart. They may possible be responsible of the high prevalence of the infection among these age group.

CONCLUSION

The establishment of this parasite among primary school pupils in this study area may portend grave consequences on human health. There is therefore the need to introduce and intensify prevention and control measures. Proper intervention by the government through provision of clean and safe drinking water, provision of free medications and public health education. Coverage and periodicity of deworming programme need to be comprehensive and intensified among public schools where the infections seem to be higher.

Comment [M26]: Proper intervention by the government through provision of clean and safe drinking water, provision of free medications and public health education is necessary.

References:

Ashtiani, M.T.H, Monajemzadeh, M, Saghi, B, Shams, S, Mortazavi, S.H, Khaki, S, Mohseni,N, Kashi, L, and Nikmanesh , B. (2011). Prevalence of intestinal parasites among children refered to children's medical center, Tehran, Iran. *Annal of trophical medicine and parasitology.* 105(7): 507-513

Brook, M.M, and Melvin D.M (2001). *Morphology of diagnostic stages of intestinal parasites of humans.* Division of Laboratory Training and Consultation, Second Edition.

Bunza, M.D.A. and Abdullahi, K. (2013), Major helminth disease agents. A.B.U press limited Zaria, Kaduna state, Nigeria.

Chijioke, I.R., Ile, C., Ilechukwu, G.C.A., Okafor, C.I., Ekejindu, I.M. and Sridhar, M.K.C. (2011). A community based survey of the burden of *Ascaris lumbricoides* in Enugu. *Ann. Med. Health Sci.,*. 1(2):165-171.

Culha, G., Kemal, M., C. Ozer, (2007). The Distribution of Intestinal Parasites among Turkish Children Living in rural area. *Middle East Journal of Family Medicine*, Vol.6, Issue 6.Ed. 3(1),20- 25.

Dangana, A., Abayomi, R.O. and Way, G.D. (2012). Survey of *Ascaris lumbricoides* among pupils of Primary school in Jos South LGA of plateau state. *J. Med. Sci. Adv.,* 1(1): 21-26.

Danladi Y.K, Ugbomoiko U.S. Babamale O.A. (2015). Prevalence and socio- environmental predictors of cryptosporiosis in Kebbi state, Nigeria. *American journal of bioscience and bioengineering. Vol. 3, No. 6, 2015. Pp 149-157.*

Drake, L. J. and Bundy, D.A. (2001) Multiple helminth infections in children: Impact and control. *Parasitology*

Elekwa and Ikeh, 1996?

Gaash, B. (2004). *Ascaris lumbricoides. Indian J. Practising Doctor.* 1(3): 11-12.

Mamman, A.S. and Maikenti, J. (2014): Prevalence of Ascariasis among Secondary School Students in Akwanga, Central Nigeria. Journal of Biology, Agriculture and Healthcare ISSN 2224-3208 (Paper) ISSN 2225-093X (Online) Vol.4, No.23, 2014

Murray, R. Patrick; Rosenthal, S.Ken, P.faller and A. Michael, (2005). *Medical Microbiology*, Fifth Edition. United States: Elsevier Mosby.

NCCLS, (1997). Procedures for the Recovery and Identification of Parasites from the Intestinal Tract.Approved guideline M28-A. National Committee for Clinical Laboratory Standards, Wayne, Pa.

Sulaiman, K. (2008). A social, economic and political history of Jega. Published by Kraft Books Ltd. ISBN: 978-978-48886-1-5.

Uwem, F.E., Simon, N.O.E., Chiedu, F.M. and Sammy, O.S. (2008). Helminthiasis and Hygiene conditions of schools in Ikenne Ogun State, Nigeria. *PLoS Negl. Trop. Dis.,* 2(1): e146.

Zahraa, S.H, 2010. A study of prevalence of intestinal parasitic infection in Shatrah district. *Thi-Qar journal of parasitology*.

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