Quest Journals
Journal of Medical and Dental Science Research
Volume 9~ Issue 10 (2022) pp: 130-133
ISSN(Online) : 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Gastro-Intestinal Parasitic Infections of Children Karaye District, Kano State, Nigeria

*[a]H. A. Ibrahim, [a]M. M. Karaye and [a]N. M. Abdullahi
([a]*Biology Department, Sa'adatu Rimi College of Education, P.M.B. 3218, Kumbotso, Kano, Nigeria*)

ABSTRACT
Gastro intestinal parasitic infection is among the common disease in families of low hygienic and low economic status in many African and Asian countries. In this studies stool samples collected from children aged between 1-8 years were analysed by the ether sedimentation technique, and examined for helminth eggs and Entamoeba cysts. However, the results indicated that the most frequently occurring intestinal helminth infection was Hymenolepis nana, and only occasionally were eggs of Enterobius vermicularis, Trichuris trichiura, Ascaris lumbricoides and hookworm spp. Observed cysts of Entamoeba spp. were present in some of the samples and ova of Schistosoma haematobium were contaminants of many stool samples. Socio-economic status. climatic conditions and social behaviour play a significant role in the incidence and transmission of parasitic infections in children of the community studied. Families and household were advised to provide improved and or build standard toilet facilities for their children and government should provide Environmental Health Workers for routine check and sensitizes the prevailing community against open defecations.
KEY WORDS: *Gastro-intestinal parasite, infection, children, Kano, Nigeria*

***R**eceived 15 Oct., 2022; **R**evised 28 Oct., 2022; **A**ccepted 31 Oct., 2022 © The author(s) 2022.*
P**ublished with open access at **www.questjournals.org

I. INTRODUCTION

Intestinal Parasite, caused by helminths and protozoan parasites, are among the most prevalent infections in humans in developing countries. In many developed countries, protozoan parasites more commonly cause gastrointestinal infections compared to helminths. Intestinal parasites cause a significant morbidity and mortality in endemic countries. Helminths are worms with many cells. Nematodes (roundworms), cestodes (tapeworms), and trematodes (flatworms) are among the most common helminths that inhabit the human gut. Usually, helminths cannot multiply in the human body. Protozoan parasites that have only one cell can multiply inside the human body. There are four species of intestinal helminthic parasites, also known as geohelminths and soil-transmitted helminths: *Ascaris lumbricoides* (roundworm), *Trichiuris trichiuria* (whipworm), *Ancylostoma duodenale*, and *Necator americanicus* (hookworms). These infections are most prevalent in tropical and subtropical regions of the developing world where adequate water and sanitation facilities are lacking[1][2] . Recent estimates suggest that *A. lumbricoides* can infect over a billion, *T. trichiura* million, and hookworms 740 million people[3][4]. Other species of intestinal helminths are not widely prevalent. Intestinal helminths rarely cause death. Instead, the burden of disease is related to less mortality than to the chronic and insidious effects on health and nutritional status of the host [4][5]. In addition to their health effects, intestinal helminth infections also impair physical and mental growth of children, thwart educational achievement, and hinder economic development [6][7].

The most common intestinal protozoan parasites are: *Giardia intestinalis, Entamoeba histolytica, Cyclospora cayetanenensis*, and *Cryptosporidium* spp. The diseases caused by these intestinal protozoan parasites are known as *Giardiasis, amoebiasis, Cryclosporiasis,* and *Cryptosporidiosis* respectively, and they are associated with diarrhea[8]. *G. intestinalis* is the most prevalent parasitic cause of diarrhoea in the developed world, and this infection is also very common in developing countries. *Amoebiasis* is the third leading cause of death from parasitic diseases worldwide, with its greatest impact on the people of developing countries. The World Health Organization (WHO) estimates that approximately 50 million people worldwide suffer from invasive amoebic infection each year, resulting in 40-100 thousand deaths annually[9][10]. Cryptosporidiosis is becoming most prevalent in both developed and developing countries among patients with AIDS and among children aged less than five years. Several outbreaks of diarrhoeal disease caused by *C. cayetanensis* have been

reported during the last decade [11]. Spread of these protozoan parasites in developing countries mostly occurs through faecal contamination as a result of poor sewage and poor quality of water. Food and water-borne outbreaks of these protozoan parasites have occurred, and the infectious cyst form of the parasites is relatively resistant to chlorine [12]. Other species of protozoan parasites can also be found in the hum an gut, but they are not pathogenic, except *Microsporidia* sp.

II. MATERIALS AND METHODS

I. Stool samples

Stool samples weighing approximately 3g were collected from hundred and eight-one children aged between 1-8 years. The sample were placed in tube containing schaudinn's fluid (Loba Chemie Pvt Ltd) fortified with polyvinyl alcohol (PVA fixative) and returned to the department of Microbiotology, Bayero University, Kano, where they were processed by the ether sedimentation technique(13) to determine the presence of helminth eggs and protozoan cysts.

II. Processing of the samples

Each stool sample was mixed thoroughly, washed through fine gauze and the effluent collected and centrifuged at 3,000 rpm for three minutes, the supernatant was then discarded and the faecal material resuspended by shaking vigorously in 7ml of water and 3ml diethyl ether. This suspension was centrifuged at 3,000 rpm for three minute and the floating detritus and excess fluid were decanted leaving a pellet of concentrated faecal matter in the bottom of the test tube. A sample of this concentrated material was then placed on a microscope slide and examined by means of a microscope (mag x 100) and the presence or absence of helminth eggs and Entamoeba cysts was recorded [13].

III. RESULTS

The incidence of intestinal parasitic infection in children of Seven villages in Karaye District is given in Table 2. Twenty-three percent of the stool samples were positive, at the time of collection, for crysts of *Entamoeba* spp. The most common intestinal helminth infection was the cestode *Hymenolepis nana* which was observed in 18% of the samples. Eggs of *Ascaris lumbricoides* were present in only two samples and on both occasions the eggs were unfertilized and the total number of ova was very low. Occasionally eggs of *Trichuris trichiura, Enterobius vermicularis*, hook worm spp and *Schistosoma mansoni* were found in the stool materials. Twenty five percent of the sample were contaminated with ova of *Schistosoma haematobium*.

IV. DISCUSSION

The incidence of intestinal nematode infections in the pre-adult population of Karaye District is very low when compared with equivalent rural communities in other countries such as Malaysia in which 72.3% positivity for intestinal protozoa[14] where found, this may reflects the high exposure of this community to poor sanitary conditions. However, the low transmission rates of these parasites in this area may be due to the extreme climatic conditions which prevail in the pre monsoon periods. During the dry season temperatures range from 30^0C - 45C for many weeks and these temperatures combined with low humidity and bright sunlight may be harmful to the free living stages of these species of soil-inhabiting nematodes.

A similar study carried out by [15]. (1982) showed the prevalence for 4.26% intestinal protozoan (2.3% and 2.62% with *E. histolytica* and *G.lamblia* respectively) and studies carried out by[16] were the prevalence rates for intestinal protozoa were 21.0% *E. histolytica,* 8.6% *G.lamblia* and only 3.3% for *E. coli* correspond with this work on the low presence of intestinal parasite on children..

The occurrence of *Hymenolepis nana* as the major Helminth parasite of the intestinal tract is worthy of note. This cestode which inhabits the distal regions of the small intestine, is capable of direct transmission as well as transmission via small arthropods such as *Tenebrio molitor*. It is possible that the high rate of transmission of *H. Nana* in this area is related to the dietry dependency on sorghum and millet and the simple way in which this crop is stored and used.

Although 25% of the stools contained eggs of *Schistosoma haematobium,* it is possible that the prevalence within the community is much greater, as this species of *Schistosome* inhabits blood vessels draining the bladder and the eggs are only occasionally found as contaminants of stool material. It is not surprising that the highest incidence of Schistosome infections are in the communities of Kwanyawa, Yola and Malan Sani, in villages associated with permanent or near permanent supplies of open water. The occurrence of low number of *E. histolytica* in this study also correlate well with that of [17] where they obtain low prevalence of *E. histolytica* (0%) and high prevalence of *G .lamblia* (24.4%) among the children in oil palm estate in Malaysia.in study carried out on parasitic infection in children.

Personal hygiene among population in these study area was of low economic status and their children tend to have peculiar habits such as not washing hands before and after eating. They also consume raw food

particularly many edible wild and cultivated fruits without washing them. This habit is also common among adults population due to low educational status, as such contribute to the high prevalence of intestinal protozoa. The results of this survey give some insight into the nature of the intestinal infections in children of this area, but more detailed and extensive study is necessary to obtain a more comprehensive picture of the prevalence of the parasitic infections and the possible routes of transmission within the community.

V. CONCLUSION

Intestinal parasite is associated with open defecation system which is still prevailing in many communities in rural set up, therefore Environmental Health Workers should embark on regular supervision of the affected community and educate them on the danger of that practice on their children health.

Figure 1: Map of Kano state showing local government area were studies was conducted, (courtesy of NigeriaGalleria)

Table 1: Information relating to the villages involved in the study, Karaye District, Kano State, Nigeria.

Name of Village	Estimated population	Medical facilities	Water supply	Sanitation facilities
Kwanyawa	3300	Government dispensary, Traditional birth attendants	Open wells and Stream	Pit latrines system
Gurawa	500	Private Health workers, Traditional birth attendants	Open wells	6 pit latrines**
Mallan Sani		Village health worker (Private)	Open well seasonal ponds	pit latrines System and Open dafaecation**
Danzau	210	Traditional birth attendants, Village health worker (Private)	Open wells seasonal ponds	Several pit latrines (used by civil servants) **
Dangayaki	1020	Traditional birth attendants	Seasonal ponds , Bore hole and Open wells	4 pit latrines, individual pit latrines System and Open dafaecation *
Yola	1200	Traditional birth attendants	Seasonal ponds	4 pit latrines (used by civil servants)
Tinkis	400	Traditional birth attendants, Village health worker (Private)	Dam , bore hole and Open wells	6 pit latrines

****** Open dafaecation very common\

Table 2: The incidence of intestinal parasitic infections in children of various villages in Karaye District, Kano State, Nigeria.

Village(s)	Number of children	Predominant age group	Entamoeba spp.	Ascaris	Hook worm spp.	Hymernolepis nan	Schistosoma, haema tobium	Others
Kwanyawa	37	1-6 Yrs	0	0	0	6	5	* **
Gurawa	22	1-4 Yrs	0	0	1	15	0	
Mallam Sani	24	1-8 Yrs	1	1	0	1	2	
Danzau	30	6-8 Yrs	0	0	0	4	1	*
Dangayaki	28	6-8 Yrs	0	0	0	4	0	*
Yola	31	3-8 Yrs	1	1	0	10	3	* ***
Tinkis	20	1-8 Yrs	0	0	1	4	0	

** S. Mansoni* *** Enterobius vermicularis* **** Trichuris trichiura*

REFERENCES

[1]. Savioli L, Albonico M. (2004) Soil-transmitted helminthiasis. *Nat Rev Microbiol*.;2:618–9.
[2]. Cappello M. (2004) Global health impact of soil-transmitted nematodes. *Pediatr Infect Dis J*. 2004;23:663–4.
[3]. de Silva NR, Brooker S, Hotez PZ, Montresor A, Engles D, Savioli L. (2003) Soil-transmitted helminth infections: updating the global picture. Trends Parasitol. ;19:547–51.
[4]. Stephenson LS, Latham MC, Ottesen EA. (2000) Malnutrition and parasitic helminth infections. Parasitology. ;121:S23–38.
[5]. Stoltzfus RJ, Chway HM, Montresor A, Tielsch JM, Jape JK, Albonico M. (2004) Low dose daily supplementation improves iron status and appetite but not anemia, whereas quarterly anthelminthic treatment improves growth, appetite and anemia in Zanzibari preschool children. *J Nutr*. ;134:348–56.
[6]. Drake LJ, Jukes MCH, Sternberg RJ, Bunday DAP. (2000) Geohelminth infections (ascariasis, trichiuriasis, and hookworm): cognitive and development impacts. Sem Paediatr Infect Dis. ;11 :245–51.
[7]. Guyatt HL. (2000) Do intestinal nematode affect productivity in adulthood. *Parasitol Today*. ;16:153–8.
[8]. Davis AN, Haque R, Petri WA., Jr Update on protozoan parasites of the intestine. Curr Opin Gastroentrol. 2002;18:10–4.
[9]. World Health Organization. (1997) Amoebiasis. *WHO Weekly Epdemiol Rec*.;72:97–100.
[10]. Petri WA, Jr., Haque R, Lyerly D, Vines RR. (2000) Estimating the impact of amebiasis on health. *Parasitol Today*. ;16:320–21.
[11]. Herwaldt BL. (2000) *Cyclospora cayetanensis*: review, focusing on the outbreaks of cyclosporiasis in the 1990s. *Clin Infect Dis.* ;31:1040–57.
[12]. Okhuysen PC, White AC (1999)., Jr Parasitic infections of the intestine. *Curr Opin Infect Dis.* 1999;12:467–72.
[13]. Harrigan, W. F, (1998). *Laboratory Methods in food diary Microbiology*. Academic Press, San Diego, C A.
[14]. Noor Azian, M.Y., San, Y.M., Gan, C.C., Yusri, M.Y., Nurulsyamzawaty, Y., Zuhaizam, A.H.,Maslawaty, M.N., Norparina, I. and Vythilingam I,(2007). Prevalence of intestinal protozoa in an aborigine community in Pahang, Malaysia. *Tropical Biomedicine* 24(1): 55–62.
[15]. Hamimah, I., Zahedi, M. & Ainiyah, A.J.(1982). The prevalence of intestinalparasites among children at the General Hospital, Kuala Lumpur,Malaysia. *Medical Journal of Malaysia* **37:** 373-377.
[16]. Sinniah, B., Sinniah, D., Singh, M. & Poon,G.K. (1978). Prevalence of parasiticinfections in Malaysian oil palm estateworkers. *Southeast Asian Journal of Tropical Medicine and Public Health* **9:** 272-276.
[17]. Nor Aza, Ashley, S. & Albert, J. (2003).Parasitic infections in human communities living on the Ringes of the Crocker Range Park Sabah,Malaysia. *Asean Review of Biodiversity and Environmental Conservation* 1-4.