UMYU Journal of Microbiology Research *ISSN: 2616 - 0668*
https://doi.org/10.47430/ujmr.1722.015
Received: 4th April, 2017 **Accepted:** 21st Dec, 2017

Prevalence of Intestinal Parasitic Infections among Out - Patients visiting General Hospital Malumfashi, Katsina State

Badamasi, M. and Liadi, Y.M.
Department of Biology, Umaru Musa Yar'adua University Katsina, Katsina State, Nigeria.
Corresponding author: mudassir.badamasi@umyu.edu.ng

Abstract
A major public health challenge is posed by gastrointestinal parasitic infections in humans mainly in developing countries across the Globe. In a bid to determine the prevalence of intestinal parasites infections among outpatients visiting General hospital Malumfashi LGA of Katsina state, a total of 200 stool samples were randomly collected. The stool samples were processed and examined macrospically and microspically by using direct smear method. The result showed the prevalence of intestinal parasites infection to be 26.00%. The age group of 51-above had the highest prevalence of 73.33%, while the least 15.12% prevalence was among the age group of 1-10. Gender wise, males had a prevalence of 26.67% while females had 25.00%. On the basis of parasites observed, Hookworm had the highest prevalence with 10%, while *Enterobius vermicularis* had the least prevalence with 0.5%. According to this result, it is apparent that the inhabitants of the study area are faced with problems of parasitic infections. Therefore, there is the need for public enlightenment to promote environmental hygiene throughout the study area and advise the inhabitants of the area to ensure proper awareness on environmental hygiene through enlightenment programmes on the incidences and transmission of intestinal parasites.
Keywords: Intestinal parasite, prevalence, stool, microscopic and macroscopic.

INTRODUCTION

Intestinal parasitic diseases are global health concerns in many developing countries and caused mainly due to fecal contamination of water and food (Odu *et al.*, 2011) as well as favourable climatic, environmental and socio-cultural factors enhancing parasitic transmissions (Mordi and Ngwodo 2007; Alli *et al.,* 2011). These parasites dwell in the gastrointestinal tract of humans and other animals (Loukopoulos *et al.*, 2007). About one third of the world (more than two billion people) is infected with intestinal parasites (Chan, 1997). Poverty, illiteracy, poor hygiene, lack of access to potable water, and a hot and humid tropical climate are some of the common factors attributed to intestinal parasitic infections (IPI) (Shitta and Akogun, 2017).

These infections are most prevalent in tropical and subtropical regions of the developing world where adequate water and sanitation facilities are lacking (Savioli and Albonico, 2004; Cappello, 2004). Recent estimates suggest that *Ascaris lumbricoides* infect over a billion, *Trichuris trichiura* infects 795 million, and hookworms infect 740 million people (de Silva *et al.,* 2003). Other species of intestinal helminths are not widely spread. Intestinal helminths rarely cause death. Instead, the burden of the disease is related to less mortality than to the chronic and insidious effects on health and nutritional status of the host (Stephenson *et al.,* 2000; Stoltzfus *et al.,* 2004). In addition to their health effects, intestinal helminth infections also impair physical and mental growth of children, thwart educational achievement, and hinder economic development (Drake *et al.*, 2004; Guyatt, 2000).

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, cyclosporiasis, and cryptosporidiosis respectively, and they are associated with diarrhoea (Davis *et al.*, 2002). *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 second leading cause of death from parasitic diseases worldwide, with its greatest impact on the people of developing countries (Stanley and Samuel, 2003).

The consistent reports by outpatients visiting general hospital Malumfashi of possible symptoms of gastrointestinal parasitic infection has led to the initiation of the study. Despite the continuous reports in the hospital, there has been no documentation of such reports. The present study is however geared towards assessing the prevalence of gastrointestinal parasites among patients visiting the hospital. Therefore, the aim of the research is to study the prevalence of intestinal infections among outpatients visiting General hospital Malumfashi, Katsina State with the hope to determine the prevalence of intestinal parasites among outpatients visiting General hospital Malumfashi, to relate the prevalence to age and gender of the patients as well as to isolate and identify the parasites involved.

MATERIALS AND METHODS

Study Location

The study was conducted at General hospital Malumfashi, Malumfashi local government Katsina state Nigeria. The hospital is owned by the state government and funded by the government.
Malumfashi is one of the thirty-four (34) Local Government Area in Katsina State with a total area of 647km^2. According to the 2006 population census, Malumfashi host a population of 182,920 people (Oladipupo, 2006). It is located in the coordinates 11°48′N7°37′E. The major inhabitants of Malumfashi are Hausas and Fulanis who are predominantly Muslim and few Christian Hausas (Maguzawa). Though the pattern of annual rainfall in this area is variable, it usually occurs between May and September with its peak in August. The main occupation of inhabitants is farming with peanut, millet, maize, cotton and sorghum being the most cultivated. The dominant vegetation of the area is Sudan Savanna type which combines the characteristics and species of both Guinea and Sahel savanna (Tukur *et al.*, 2013).

Parasitological Survey

The study was carried out among the out patients of the laboratory section with ages of (1-70 years). Survey was restricted to patient directed to the parasitological unit alone because of their willingness to give samples for clinical examination.

Ethical Consideration

Ethical approval was sought and obtained from the Research ethics review committee of the Katsina State Ministry of Health. This was done to be in line with the ethical provisions expected of this kind of research.

Stool Samples Collection

Two hundred (200) stool samples were collected in sterile plastic containers, carefully labeled and transported to parasitology unit, for examination within 20 minutes of collection as previously described by (Shitta and Akogun, 2017).

Examination of Stool Samples

The parasitological techniques employed in the examination of stool samples were microscopy and direct smear examination. All the faecal samples were also examined macroscopically for their colour, consistency and presence of adult worms, eggs, cyst and trophozoites.

Direct Microscopic Examination Using Lugo's iodine and Normal Saline

The direct microscopic examination was done in the parasitological section of the hospital. One drop of normal saline and one drop of lugol's iodine was drop at each end of the glass slide. The small amount of the faecal sample was picked using application stick, emulsified first in the normal saline then in the lugol's iodine respectively and then each preparation covered by cover slip. The prepared slides were then examined using 10× and 40× objective lenses of a digital compound microscope (SWIFT M10) as described by (Shitta and Akogun, 2017).
The identification of parasites was done by consulting (CDC, DPDX atlas) Laboratory identification of parasites of public health concern.

Macroscopic Examination

The stool samples were macroscopically observed for presence of blood, mucus, colour, presence of adult worm and consistency of stool as described by (Windell *et al.,* 1996).

Statistical Analysis

The data obtained in the study were analysed statistically using Chi-square (x^2) to compare the differences in the rate of infection between the age groups, gender and source of drinking water. Graphpad instat 3 was the statistical package utilized for the purpose of the analysis.

RESULTS

Out of a total of 200 stool samples examined, 52(26.00%) was observed to be infected with intestinal parasites which were majorly helminthes and protozoan parasites (Table 1). Though the result indicated that 26% of the study population were infected with at least one form of the intestinal parasites, on the basis of gender, the males 32(26.67%) had a slightly higher prevalence of infection than the females 20(25.00%). Statistical analysis however revealed that there was no significance difference between the two sexes (P> 0.05) (Table 2). According to the ages, all the age groups showed different levels of intestinal parasitic infection. The highest prevalence was observed in the age group of 51-above having 11(73.33%) with the least in the age group 1-10 which had 13(15.12%). Despite this, there was no significant difference in the prevalence of intestinal parasitic infections in the age groups (P> 0.05).

In the age group of 1-10, infections with hookworm, *Entamoeba histolytica, Entamoeba coli* and *Giardia lamblia* were observed. However, in this same group, hookworm had the highest prevalence of 6(6.98%) and was followed by *E. histolytica* 4(4.65%) with the rest having least infection rates. In the age group 11-20, *G. lamblia* was observed to have the highest infection rate of 4(13.33%). *Hymenolepis nana* with 3(14.29%) had the highest prevalence among the age group 21-30. The age groups of 31-40, 41-50 and 51-above had hook worm to have the highest prevalence of 5(17.86%), 3(15.00%) and 5(33.33%) respectively (Table 3).

In relation to drinking water sources, patients that utilize both well and tap water had the highest prevalence of 22(56.41%) with tap water having the least 10(16.95%). There was also no significant difference (P> 0.05) with respect to drinking water sources.

Table 1: Prevalence of individual parasite

Parasite	Number infected	Percentage (%)
Hookworm	20	10
E.hitolytica	10	5
H. nana	3	1.5
A.lumbricoided	1	0.5
E. coli	4	2
S. stercolaris	2	1
Taeniasis	4	2
S.mansoni	2	1
G.lamblia	5	2.5
E. vermicularis	1	0.5
TOTAL	**52**	**26**

Table 2: Prevalence of intestinal parasites according to gender

Sex	Number examined	Number infected	Infection rate (%)
Male	120	32	26.67
Female	80	20	25.00
Total	**200**	**52**	

P<0.05 x^2 =0.875 df=1

Table 3: Age-specific prevalence of intestinal parasites

Age	No. Examined (%)	No. Infected (%)	Hook worm (%)	E. histo. (%)	H. nana (%)	A. lumb. (%)	E. coli (%)	S. ster. (%)	Taenia spp. (%)	G.lamblia (%)	S. mansoni (%)	E. verm. (%)
1-10	86(43.00)	13(15.12)	6(6.98)	4(4.65)	0	0	1(1.16)	0	0	1(1.16)	0	0
11-20	30(15.00)	8(26.67)	1(3.33)	1(3.33)	0	0	1(3.33)	0	0	4(13.33)	0	1(3.33)
21-30	21(10.50)	7(33.33)	0	2(9.52)	3(14.29)	1(4.76)	0	0	1(4.76)	0	0	0
31-40	28(14.00)	9(32.14)	5(17.86)	1(3.57)	0	0	0	1(3.57)	2(7.14)	0	0	0
41-50	20(10.00)	4(20.00)	3(15.00)	0	0	0	0	1(5.00)	0	0	0	0
51-above	15(7.50)	11(73.33)	5(33.33)	2(13.33)	0	0	2(13.33)	0	1(6.67)	0	2(13.33)	0
T0tal	**200(100)**	**52(26.00)**	**20(10.00)**	**10(5.00)**	**3(1.50)**	**1(0.50)**	**4(2.00)**	**2(1.00)**	**4(2.00)**	**5(2.50)**	**2(1.00)**	**1(0.50)**

$P<0.05$ $x^2=109.94$ df=55

Table 4: Prevalence of intestinal parasites in relation to drinking water source

Drinking water source	Number examined (%)	Number infected (%)
Well	102(51.00)	20(19.61)
Tap	59(29.50)	10(16.95)
Both tap and well	39(19.50)	22(56.41)
Total	**200**	**52**

$P<0.05$ $x^2=11.79$ df=2

DISCUSSION

The outcome of the prevalence of intestinal parasitic infection among patients visiting General hospital Malumfashi was 52(26.00%). The result of this study thus, showed a lower prevalence than those recorded in previous studies. This result is quite lower than the prevalence of 50.6% observed among primary school children in Uga (Igbinosa *et al.,* 1996) and 66.7% in Aniocha, Delta State (Houmsou *et al.,* 2010). The males had a higher rate of infection than the females, though without significant difference. This corresponds to a similar work carried out by (Shitta and Akogun, 2017). Going by the number of intestinal parasites revealed in this study, it is obvious that the environmental conditions in the study area support the transmission of wide range of parasites. Worthy of mention is that hookworm and *E. histolytica* were the most common isolated parasites in this study. This is not surprising because these parasites are most common in the tropics and the study area having little or no proper hygienic practices.

The overall prevalence of these intestinal parasites in this study could be attributed to a number of factors which include; poor defecation habit, playing in dirty environment and playing with soil as seen in children, walking barefooted and consumption of poorly cooked food. The prevalence in the age group of 1-10 agrees with a similar work of Shitta and Akogun, (2017). The highest prevalence as observed in the age group 51-above can be correlated to their nature of work whereby most of them are farmers and could have become infected by eating with their unwashed hands which could be laden with infective stages of the parasites.

E. histolytica infection occurs through faeco-oral route, hence, its presence indicates poor sanitary conditions and poor food and personal hygiene. Transmission of hookworm is through penetration of the body mostly feet of human by infective larvae. Its presence thus, depicts indiscriminate bush defecation and that most of the infected individuals walk around barefooted on infected soil. This observation agrees with an earlier observation made by (Obiukwu *et al.,* 2009).

CONCLUSION

Despite the low prevalence of intestinal parasitic infection recorded in this study, it is important to set in motion strategies to further reduce the infection rates of these parasites in the area. Infection with intestinal parasites is mainly as a result of negligence of basic personal hygiene. Some factors implicated in these infections are many but not limited to; poor environmental sanitation, inadequate water supply and poor personal hygiene. A way by which the incidences of these infections can be greatly mitigated is by public enlightenment of the inhabitant of the area of the importance of maintaining good hygiene and sanitation.

REFERENCES

Alli, J.A., Kolade, A.F., and Okonko I.O. (2011). Prevalence of intestinal nematode infection among pregnant women attending antenatal clinic at the University College Hospital, Ibadan, Nigeria, *Advances in Applied Science Research,* **2**:1–13.

Cappello, M. (2004). Global health impact of soil-transmitted nematodes. *Pediatrics Infectious Diseases Journal*, **23**:663–4.

Chan, M.S. (1997). The global burden of intestinal nematode infections—Fifty years on. *Parasitology Today*, **13**:438–43.

Davis, A.N., Haque, R. and Petri, W.A. (2002). Update on protozoan parasites of the intestine. *Current Opinion Gastroentrol,* **18**:10–4.

De Silva, N.R., Brooker, S., Hotez, P.Z., Montresor, A., Engles, D. and Savioli, L. (2003). Soil-transmitted helminth infections: updating the global picture. *Trends in Parasitology*, **19**:547–51.

Drake, L.J., Jukes, M.C.H., Sternberg, R.J. and Bunday, D.A.P. (2000). Geohelminth infections (ascariasis, trichiuriasis, and hookworm): cognitive and development impacts. *Paediatric Infectious Diseases,* **11**:245–51.

Guyatt, H.L. (2004). Do intestinal nematodes affect productivity in adulthood. *Parasitology Today*, **16**:153–8

Houmsou, R.S., Amuta, E.U. and Olusi, T.A. (2010). Prevalence of intestinal parasites among school children in Makurdi, Benue State, Nigeria. *The International Journal of Infectious Disease,* **1**: 4-7.

Igbinosa, I.B., Ogbunuju, T.C., and Ugbomoiko, U. A. (1996). The pattern of intestinalparasites among school children in Uga, Anambra State. *Journal of Medical Laboratory Science,* **5**: 27-31

Loukopoulos, P., Komnenou, A., Papadopoulos, E. and Psychas, V. (2007). "Lethal ozolaimus megatyphlon infection in a green iguana (Iguana iguana rhinolopa)," *Journal of Zoo and Wildlife Medicine*, **38(**1): 131–134.

Mordi, R.M. and Ngwodo, P.O.A. (2007)."A study of blood and gastro-intestinal parasites in Edo state," *African Journal of Biotechnology*, **6**(19): 2201–2207.

Obiukwu, M.O., Igbodika, M.C. and Onyido, A.E. (2009). Community survey of geohelminth infection in Nnewi, Anambra State. *African Journal of Sciences,* **10**(1): 2364-2376.

Odu, N.N., Akujobi, C.O., Maxwell, S.N., and Nte, A.R. (2011). "Impact of mass deworming of school children in rural communities in Rivers State, Nigeria: option for programme sustainability," *Acta Parasitologica*, **2**: 20–24.

Oladipupo, A. (2006). Sun news online. The Sun publishing Ltd. Retrieved 2007-02-17.

Savioli, L., and Albonico, M. (2004). Soil-transmitted helminthiasis. *Nature Review of Microbiology*, **2**: 618–620

Shitta, K.B. and Akogun, O.B. (2017). Intestinal helminth infections among the nomadic Fulanis in two localities of Adamawa State, north-east Nigeria. *Nigerian Journal of Parasitology,* **38**(1): 69-73.

Stanley, M.D. and Samuel, L. (2003). Amoebiasis. *The Lancet,* **361**(9362): 1025-1034

Stephenson, L.S., Latham, M.C., Ottesen, E.A. (2000). Malnutrition and parasitic helminth infections. *Parasitology*, **121**: S23–38.

Stoltzfus, R.J., Chway, H.M., Montresor, A., Tielsch, J.M., Jape, J.K., 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. *Journal of Nutrition*, **134**: 348–56.

Tukur, R., Adamu, G.K., Abdulrashid, I., Rabiu, M. (2013). Indigenous trees inventory and their multipurpose uses in Dutsin-Ma area of Katsina State. *European Science Journal,* **9**(11): 288-300.

Windell, L.R., Hiroshi, T., Mary, R.A., Haruki, U. and Kanbara, H. (1996). Differentiation of *Entamoeba histolytica* and *E. dispar* DNA from cysts present in stool specimens by polymerase chain reaction: its field application in the Philippines. *Parasitology Research,* **82**(7): 585-589.