Socio-demographic and ClinicalStudy of Protozoan and Helminth Parasites of Drinking water in Eastern Zone of Kogi ,Nigeria

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ABSTRACT

A study on Socio-demographic and Clinical Features of Protozoan and Helminth Parasites of Drinking water in Eastern Zone of Kogi ,Nigeria, was carried out between July 2013 and May 2015 using water concentration method for parasite isolation.Eleven rivers in six Local Government Areas were studied for parasites isolation, protozoans parasite such as *Balantidium coli*, *Chilometrix mensili (Cm), Cryptosporidium parvum (cp), Enteromonas homini (Eh), Giardia lamblia (Gl),Entamoeba histolitica (Eh),Retortmonas intesthialis (RI), Isospora belli (Ib) Iodamoeba buetshlli (Ib), Cyclospora cayatenesis.The commonest helminth parasites include: Fasciola hepatic (Fh), Taenia Sp, Ancyclostoma duodenale (Ad), Gongylonema Pulchrum (Gp), Dictophylma Renale (Dr),Schistosoma. intercalatum (Si), Enterobium vermicularis (Ev), Diphyllobdhrium latum (Dl), Ascaris lumbricoides (Al), Dracunculus mediness (Dm)*The research interview and questionnaire into various communities and hospitals of the study areas also supported cases of protozoans and helminth infection. Though the opinion of the respondents indicated more of helminth infection, and that majority of people with protozons and helminth infection is not far from community water users. It is therefore recommended that people should be advised to carry out water treatment before used.

Key words: Socio-demographic, Protozoan, Helminth Infection, Kogi

1.0 INTRODUCTION

The waterborne route (Panagiotis *et al.,* 2007) transmits a number of protozoan parasitic infections of humans. Encysted pathogenic protozoan parasites such as oocysts of *Cryptosporidium parvum* and *Giardia lamblia* are usually introduced into surface waters from animal faecal material and human sewage. Indeed, it would seem that their presence in our nation's surface waters is quite ubiquitous, and this presence can threaten the health of the public.*Giardia spp*. and *Cryptosporidium* spp. are recognizedworldwide as highly infectious protozoan parasites thatcan cause severe gastrointestinal disease in humans andanimals (Armon *et al*., 2002; Rose 2002). In recent years, thepresence of these parasites has been reported usually insuperficial waters and sewage samples in many countries (Armon *et al.,* 2002). Sewage sludge is a by-product of activated sludge treatment; it contains an elevated mixture of organic and inorganic compounds and, because of this, a growing trend for the application of this treated sewage residue on agricultural land zones

has emerged. During wastewater treatment by this process, cysts and oocysts of protozoan parasites are sedimented in the sludge. Meanwhile, the presence of these protozoa has implications concerning sewage sludge reuse (Armon *et al*., 2002). Consequently, it is important to quantify the presence of oocysts associated with the practice of sludge application in agriculture and more accurate detection and quantification methods are necessary. Knowing the potential for harm that encysted parasites have, and theprohibitive expense of equipping every water treatment facility 100%, the most effectiveoocyst removal processes, is prevention. Forprevention to be effective however, the significant sources of oocysts in each watershedneed to be defined and managed, but identification of those sources is not as easy as itwould seem. Many of the sources of encysted protozoa in a watershed are not of a point source. This study was designed to assess the occurrence of parasites cysts such as helminthes and protozoans in Public drinking water.

2.0 MATERIALS AND METHODS

2.1 Study Areas

The Eastern zones of Kogi State consist of nine Local Government Areas. Out of these, eleven public rivers in six different Local Government Areas were examined using systematic samplying techniques without bias to choose the Local Government Areas. The sample collection was carried out in the major public river in **Dekina, Bassa, Idah, Ankpa, Omala, and Ofu,** local government areas in the state.

Ankpa is a Local Government Area in Kogi State, Nigeria. Its headquarter is in the town on the A233 highway in the west of the area at7°22′14″N 7°37′31″E / 7.37056°N 7.62528°E. It has an area of 1,200 km² and a population of 267,353 at the 2006 census. The postal code of the area is 270. The north-easterly line of equal latitude and longitude passes through the LGA**.**

Bassa Local Government having a population of 404,777 as at 1991 census projection for 2004 (Simon 2004) is situated along longitude 6036′E and 7^0 30 ′Eand latitude 7^0 30′ E And 8′05^0 N and is bounded the east by Oganenigwu, on the west by Adavi, on the north by Ijumu L.G.A. and on the south by Dekina L.G.A. The local government is not very large compared to Dekina L.G.A. A great number of activities usually associated with most of the township go on in the local government. The sanitary condition of the environment is extremely poor, because majority of the inhabitants are farmers, artisan workers and traders. Farmlands are used as toilets, as there are few public and even private toilet systems in some areas. Some fishing activities also go on there and at the end of the day's work, the farmers take their bath at the banks of the river and wash their produce before being taken to the market.

Dekina is located in the north-eastern part of Odu-Iyale township. It lies approximately between longitude 6 ^{0} 36′E and latitude 7^0 30′E and is bordered to the west by Ofu township, to the north by Bassa L.G.A. and to the south-east by Ankpa township. It is the headquarter home-town of Dekina L.G.A,. the largest L.G.A. in Nigeria in

terms of land mass. The northeasterly line of equal latitude and longitude passes through the southeast of the LGA. It has an area of 2.461km (950sqmi) and population of 260, 312 at the 2006 census.

Idah is located at the left bank of lower Niger area of Nigeria. On latitude 7° 06'N and longitude 6° 43'E of the Greenwich Meridian in the Guinea Savannah vegetation zones of Nigeria

Omala, local Government Area in Kogi State, Nigeria is bounded in the north by the Benue River. Its headquarters are in the town of Abejukolo (or Abajikolo) in the north of the area. The northeasterly line of equal latitude and longitude passes through the southeast of the LGA. Omala is located north-west of odu –iye.

OFU is a Local Government Area in kogi state, Nigeria, the western boundary, its headquarter is in the town of Ugwoawo to the south of the area at 7*14, 6*55. The northeasterly line of equal latitude and longitude passes through the L.G.A. It has an area of 1,6801km and a population of 192,169 at the 2006 census.

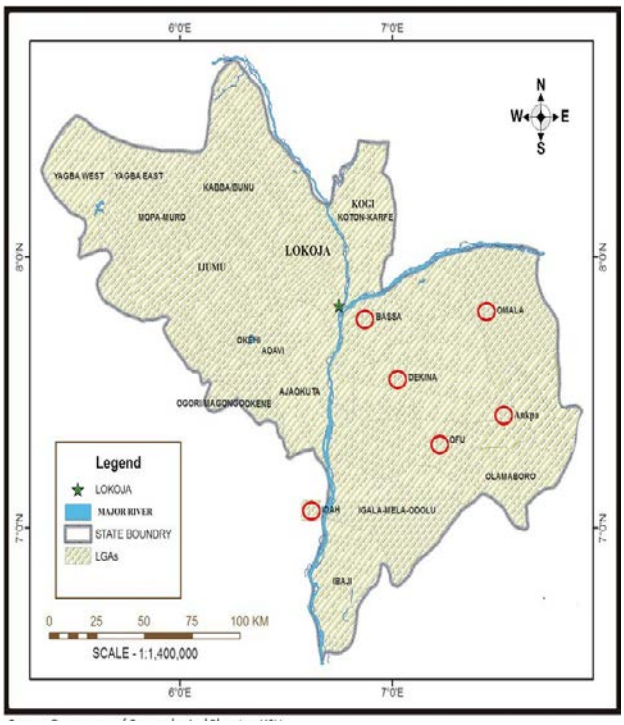

Figure 3.2: Map of Kogi State Showing the Sampling Site

Source: Department of Geography and Planning, KSU (2012).

2.2 Methods

Method of protosoans concentration by Payment, *et al.*,(1989) Kfir *et. al.* (1995) was used.to verify the result obtainable by Vesey *et al.*, 1994). In each water sample, protozoa were collected from the nitrocellulose membrane according to the method of Payment *et al.*(1989) and Kfir *et. al. (1995*), the pH of each sample was adjusted to 3.5. Every sample was filtered separately through a nitrocellulose membrane (0.45µm pore size, 142 mm diameter, Millipore).

RESULS AND DISCUSSION

Table : Socio-demographic and Clinic Features of Protozoan and Helminth infection in six LGAs of the Study Areas

Study Areas	Protozoan & Helminth infection	AGE				SEX		OCCUPATION			MARITAL STATUS	
(LGAs)	**Respondents**	Bellow or equal 35 yrs	34 -45 yrs	46 – 55 yrs	56 above	Male	Female	Education	Higher education	Non education	Married	Single
Ankpa	+++		6	4	-	8	2	6	2	-	8	5
Dekina	+++	5	7	4	2	14	5	16	3	-	14	4
Ofu	+++	10	3	-	-	8	5	12	16	3	14	4
Idah	++	17	1	-	-	11	7	17	-	-	-	18
Omala	++	5	8	-	1	9	3	11	-	1	8	5
Bassa	++	7	6	41	3	19	4	17	2	-	18	4
Total		53	31	49	6	69	26	79	23	4	62	40

Note: ++ =Stand for 11 to 50 respondents +++ = Stand for 51 to infinity respondents

Looking at Socio-demographic and clinic features of protozoan and helminth infection in six LGAs of the Study, In Bassa LGA,the same number of respondents agree to both helmith & protozoa (+++) more than the respondent that disagree (+) .This suggest that both helmith & protozoa infection may be taken the same trend in Bassa LGA. Omala LGA had more number of respondents agree to helmith infection (+++) than protozoa (++) . Ofu LGA had more number of respondents agree to helmith infection (+++) than protozoan (++).The same number of respondents agree to both helmith & protozoa (+++) more than the respondents that disagree (++).This suggest that both helmith & protozoa infection may be taken the same trend in Dekina LGA.For Ankpa LGA there are more respondents agree to protozoa infection (+++) than helmintic Infection (++) ,this suggest that protozoa parasite may likely infect more people than helminth parasite. For Dekina LGA .The same number of respondents agree to both helmith & protozoa (+++) more than the respondents that disagree (++).This suggest that both helmith & protozoa infection may be taken the same trend in Dekina LGA .In conlusion the overall result show that both Bassa and Dekina LGA reveal equal chance of helminth and protozoan infection (+++).Whereas Ofu, Ankpa, Omala and Idah LGA show more of helminth infection (+++) than protozoan (++). The result also shows more of helminthic cases than protozoan in all the study areas. Only two LGA (Bassa and Dekina) give more data for protozoan cases (+++). The study had an apparent relationship with work of (Anon, 1996; Barbara, 1997) which ascertained that water borne parasite has their shed in faecal matter and spread via contaminated water and the occurrence is dependent on factors that include season, age and other demographic characteristics of a population.

3.0 CONLUSION AND RECOMMENDATION

The research interview and questionnaire into various communities and hospitals of the study areas also supported cases of protozoans and helminth infection. Though the opinion of the respondents indicated more of helminth infection, and that majority of people with protozons and helminth infection is not far from community water users. It is therefore recommended that people should be advised to carry out water treatment before used.

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