

PREVALENCE OF *Entamoeba histolytica* INFECTION AMONG PRIMARY SCHOOL CHILDREN IN FIVE SELECTED COMMUNITIES OF WUSHISHI LOCAL GOVERNMENT AREA, NIGER STATE, NIGERIA

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ABSTRACT

Ameobiasis is an infection caused by *Entamoeba histolytica*, which is a serious problem especially in developing countries and ranks third among the parasitic infections that lead to death mostly in primary age children. The aim of the present study was to investigate the prevalence of *E. histolytica* in young children. Three hundred (300) children aged 0-14 years were sampled for *E. histolytica* infection in five rural communities in Wushishi Local Government Area, Niger State, North Central Nigeria. The stool samples were examined for cysts of *E. histolytica* using saline and iodine preparations. The prevalence rate of 17 % was recorded. The prevalence by sex had a higher infection rate in males (19.3 %) than females (14.6%) which was not significantly ($P>0.05$). The prevalence of the infection in relation to age was highest (23%) in 7 to 10 year age group, while the least infection of 12 (12%) was recorded in 11 to 14 year age group. A significant association was found between the sources of drinking water and prevalence of *E. histolytica* ($P<0.05$). The highest was recorded in those using stream/pond (89.2%) and least recorded from Borehole/Tap (40.3%). Therefore, it become necessary need for improved sanitation, personal hygiene, health education policy and a proper deworming scheme amongst school children in the study areas in order to decrease infections rate.

Keywords: Prevalence, *Entamoeba histolytica*, Pupils, rural communities, Niger State.

INTRODUCTION

Amoebiasis also known as amoebic looseness of the bowels is an infection due to any member from the Entamoeba group, a protozoan that occurs worldwide (Pritty and Clark, 2008). The most notable prevalence of amoebiasis is in developing nations in which obstructions between human excrement, meals and water segments are insufficient. Amoebiasis is a disease condition caused by *Entamoeba histolytica* and is perceived to reason around 500 million infections for every annum in developing countries, with a frequency of roughly 50 million and 100,000 deaths (Haque and Petri, 2006).

The prevalence of amoebiasis varies with the population of persons affected, varying among nations and between zones with various financial conditions. Amoebiasis happens around the world, besides its miles most extreme ordinary in tropical areas with swarmed dwelling circumstances and negative sanitation. Africa, Mexico, Part of South America and India have great estimated health issues related with this infection (Haque and Petri, 2010). A few epidemiological examinations have demonstrated a high frequency of intestinal parasitic infections among Nigerian children (Ajero *et al.*, 2008). The event bit by bit increments over the span of youth and usually arrives at its greatest predominance in young people (Azikwe, 2006). The high prevalence of *E. histolytica* contaminations is firmly associated with poverty, poor personal hygiene, poor environmental hygiene and poor health care service providers having an inadequate supply of drugs medication and inappropriate acknowledgment of the transmission systems and life-cycle styles of those parasites (Mbanugo and Onyebuchi, 2002). Kids and pregnant women are normally vulnerable to these diseases. School youths, extraordinarily, are appropriate

focuses for mass treatment programme towards intestinal worms because of the reality they are said to have a higher event of the infection (Mbagwu *et al.*, 2019).

Amoebic dysentery remains an important health problem in Nigeria on account of insufficiencies in sanitation framework and health care facilities (Haque and Petri, 2006). Clinical features of amoebiasis extend from asymptomatic colonization of amoebic colitis (loose bowels or the runs) and intrusive extraintestinal amoebiasis, which is showed most typically looking like liver abscesses (Fotadar *et al.*, 2007). Worldwide insights on the prevalence of *Entamoeba histolytica* contamination demonstrate that 90 % of individuals keep on being asymptomatic while the contrary 10 % expand clinically unmistakable disorder ((Haque and Petri, 2006). When the parasites attack the intestinal wall, they arrive at the submucosa and the fundamental veins. From that point, trophozoites venture in the blood to sites alongside the liver, lungs or pores and skin. Encystation happens in the intestinal lumen, and sore arrangement is whole when 4 nuclei are produce. These infective growths are given into the environmental factors in human faeces and are confirmation against a development of substantial circumstances (Nematian *et al.*, 2012). *Entamoeba histolytica* is essentially associated by means of the ingestion of food and water which are faecally contaminated with the cysts of the parasite (Ibrahim, 2008). In Nigeria, the prevalent and wide spread of amoebiasis which has been attributed to a ton of various environmental sources of transmission (Ajero *et al.*, 2008; Inabo *et al.*, 20014). A few reports have perceived amoebiasis as a significant medical issue particularly among young children of developing nations.

In any case, these have shown a high predominance of intestinal parasitic contaminations among Nigerian kids in various areas (Aribodor *et al.*, 2012).

Although considerable work has been done in various parts of the world, including Nigeria, there are no published reports on the prevalence of *E. histolytica* from Wushishi local Government area of Niger State to the best of our knowledge. This study therefore aims at filling the information gap on the prevalence of *E. histolytica* infection in some selected rural communities using primary aged children in Wushishu local government area.

MATERIALS AND METHODS

Study Area

The investigation was carried out in five communities of Wushishi Local Government area in Niger State, Nigeria. These includes:- Maito, Lokogoma, Wushishi, Zungeru, Kanko .Wushishi. is situated between Longitude 9°43'N and Latitude 6°04'E and it has an area of 1,879 km² with a populace of 81,783 at the 2006 census evaluation (Census, 2006).

Study Population

The study population consists of a total of three hundred (300) pupils, with (60) pupils selected each from the five communities of Wushishi in Niger State, Nigeria.

Study Design

This is an observational cross section study aimed at capturing the Children population aged between 4-14 years determining the prevalence of *Entamoeba histolytica* among pupils of five selected communities in Wushishi local Government area. The research was conducted within the periods of April to November, 2019.

Ethical Clearance

This study was approved by the board of State Ministry of Health before the commencement of the research study. This study was also conducted at no cost to the subjects and any information obtained from the pupils remains strictly confidential.

Laboratory Analysis Techniques

The collected stool samples were first observed cautiously for consistency, presence of blood stains and any normally obvious parasites (Wakid, 2010). Direct smear and staining methods were utilized to process the stool as described by Cheesbrough, (2005) and afterward observed microscopically utilizing x10 or x40 objective for cysts or trophozoites. A Fomal ether concentration techniques was furthermore used for more quantitative assessment (Botelho *et al.*, 2011).

Data Analysis

Chi-square test was used to evaluate the level of association between the different factors studied. The analysis was done using Statistical Package for Social Sciences (SPSS) version 21 software.

RESULTS

The results of our discoveries revealed that out of the 300 school understudies examined, 51 (17%) were found to be positive for *Entamoeba histolytica* infection (Table 1). The prevalence recorded by by individual communities were as follows; Maito 11.6%, Lokogoma 15%, Wushishi 28%, Zungeru 20% and Kanko 10% (Table 1). There was no association between the communities inspected and the prevalence of *E. histolytica* disease ($P > 0.05$). The prevalence of *E. histolytica* according to sex indicated that out of the 150 female analyzed, 22 (14.6%) were positive or contaminated, while of 150 male students inspected, 29 (19.3%) were infected with *E. histolytica*. The slight increment in male contrasted with the female was not statistically significant ($P > 0.05$) (Table 2). The prevalence of the contamination according to age was most significant (23%) in 7 to 10 age group (Table 3), while minimal disease of 12 (12%) was recorded in 11 to 14 age group. In any case, there was no relationship among the diverse age group ($P > 0.05$) (Table 3). The infection of *E. histolytica* in relation to sources of drinking water is shown in (Table 4). Pupils using water from the stream had the highest infection (89.2%), while the least infections (40.3%) were found in pupils using tap/ borehole water. The prevalence of infection according to sources of drinking water is significant ($P < 0.05$). However, there is an association between sources of drinking water and the infection.

Table 1: Prevalence of *E. histolytica* infection in children 4-14 years in Wushishi LGA

Community	No.of sample	No.of Positive	Percentage Prevalence (%)
Maito	60	07	11.6
Lokogoma	60	09	15
Wushishi	60	17	28.3
Zungeru	60	12	20
Kanko	60	06	10
Total	300	51	17

Key; No; = Number of sample.

Table 2: Prevalence of *E. histolytica* infection in relation sex in Wushishi LGA

Sex	No. of sample	No. positive	Percentage (%) Prevalence
Male	150	29	19.3
Female	150	22	14.6
Total	300	51	17

Table 3: Prevalence of *E. histolytica* infection in relation to age group

Age	No. of sample	No. positive	Percentage (%) Prevalence
4 – 6	100	16	16
7 – 10	100	23	23
11 – 14	100	12	12
Total	300	51	17

Key; No; = Number of sample.

Table 4: Prevalence of *E. histolytica* infection in relation to sources of drinking water.

Sources of drinking water	No. Samples	No.of Positive	Percentage(%) Prevalence
Well	149	81	54.4
Borehole/Tap	114	46	40.3
Stream/Pond	37	33	89.2
Total	300	160	53.3

DISCUSSION

The result of this investigation indicated that the general prevalence of *E. histolytica* infection among understudies of five communities in Wushishi local government area remained at 17%. The prevalence rate recorded in this examination was in consistence with the report of (Aribodor *et al.*, 2012; Gimba *et al.*, 2014) in Anambra, South east Nigeria separately. The prevalence of *E. histolytica* recorded in this investigation was very lower than those got by some other researcher. A prevalence of 26.7% among young kids was recorded in Lafia, Nasarawa State (Reuben *et al.*, 2013). Likewise, with 72.00% in Abeokuta Ogun State South Western Nigeria, (Damen *et al.*, 2011) with 80.90% in Konduga Borno State North Eastern Nigeria, (Egbuobi *et al.*, 2013) with 64.10% in Akonkwo Imo State South Eastern Nigeria and (Simon-Oke and Ogunleye, 2015) with 67.63% in Akure Ondo State South Western Nigeria.

The prevalence of *E. histolytica* infection obtained in this investigation among the five communities was not statistically significant ($P > 0.05$). This could as a result of predisposing factors which are prevailing in the study communities such as ignorance, unhealthy sociocultural practices, poor drainage system, unhygienic methods of disposing human faeces and refuse, poverty, inadequate health care facilities as well as low standard of personal hygiene and general cleanliness in the communities.

The slight increase in the prevalence of male compared to female observed was also not a statistically significant. However, this could be attributed to the fact that they are more adventurous than their female counterparts and have a greater tendency of indulging in outdoor activities (Reuben *et al.*, 2013; Inabo *et al.*, 2011). It could also be maintained that males engaged more in activities that predisposes them to the

infections such as farming, fishing, and hunting. These activities necessitated more contact and exposure to the infections. On the other hand, female children are more preoccupied with domestic activities which limits their level of exposure to the possible sources of infection (Aribodor *et al.*, 2012). This is however contrary to the report of (Nyenke *et al.*, 2008) in Degema and environs where they reported that females were more infected than males.

The high prevalence of 16% and 23% recorded among children between age groups 4 to 6 and 7 to 10 respectively could be as a result of their low immunity, social and sanitary habits since they spend most of their time outdoors. They play a lot with hand on sand with no care and also eat most of the time with unwashed hands. The age group 11-14 recorded the least level of infection. This could be attested to the fact that they are quite matured and are so conscious of the need to take personal hygiene more seriously as compared to the other age group. This agrees with the findings of (Reuben *et al.*, 2013; Schmidt and Roberts, 2019).

The significant difference ($P < 0.05$) in the prevalence of *E. histolytica* observed in children that sourced water from well, borehole and stream 5%, 40% and 89.2%, respectively (Table 4) . Pupils using water from the stream had the highest infection while the least infections were found in pupils using tap/ borehole water. The prevalence of infection according to sources of drinking water is significant. This could be due to the extent to which these water sources are associated with defecation habits, sewage disposal habits and the level of sanitation at home and in the community at large.

Similarly, this study results agrees with (Lawan *et al.*, 2004) reported a statistically significant relationship between gastro intestinal infection and source and domestic treatment of

drinking water, among the under-fives in Jos, Plateau State Nigeria.

CONCLUSION

The high prevalence of *E. histolytica* disease in children in tropical Africa is a developmental challenge which calls for the assessment of the impact of programmes on evaluation of the effect of projects on impact of millennium development goals in the areas of health. Mass chemotherapy and coordinated proportions of parasitic control would be of most extreme significance in decreasing the degree of diseases among kids. Consequently, it is suggested; that the general population ought to be sensitized on personal and public health; health training on these parasitic infections ought to be instructed in school and through the local health workers to the people of their immediate environment.

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