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PREVALENCE OF INTESTINAL PROTOZOAN PARASITES INFECTION AMONG PRIMARY SCHOOL PUPILS IN BOSSO LOCAL GOVERNMENT AREA, NIGER STATE, NIGERIA.

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ABSTRACT:

The study was carried out to determine the prevalence of *Entamoeba histolytica* and *Giardia lamblia* among primary school pupils in four communities of Bosso Local Government Area in Niger State, Nigeria. Stool samples from 250 pupils were collected and examined for *Entamoeba histolytica* and *Giardia lamblia* using formol ether concentration technique. Out of the 250 samples analyzed, 115 (46%) for either *Entamoeba histolytica* or *Giardia lamblia* or both. Ninety (36.0%) subjects were positive for *Giardia lamblia* while 46 (18.4%) subjects had *Entamoeba histolytica*. Single species infection was seen in 78 (67.8%) of the infected pupils whereas 47 (40.9%) were infected with both parasites. The age group (9-10) years had the highest rates of infection of 14 (21.5%) and 37 (56.9%) for *G. Lamblia* and *E. histolytica* respectively. Males had the highest rate of infection (53.5%) compared to the females with (46.3%). Poverty, ignorance and poor environmental sanitation were factors found to be associated with the high prevalence rates recorded.

Keywords: Protozoan, Parasites, Infections, Pupils, Bosso, Niger State, Nigeria.

PREVALENCES DES INFECTIONS INTESTINALES DE PARASITES PROTOZOAIRES PARMIS LES ELEVES DE L'ECOLE PRIMAIRE DE BOSSO, CHEF LIEU DE GOUVERNEMENT LOCAL DE L'ETAT DU NIGER, NIGERIA

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RÉSUMÉ

L'étude a été effectuée afin de déterminer la prévalence de *Entamoeba histolytica* et de *Giardia lamblia* chez les élèves des écoles primaires dans quatre communautés de Bosso, chef lieu de gouvernement local de l'Etat du Niger, Nigéria. Des échantillons de selles de 250 élèves ont été recueillis et analysés pour *Entamoeba histolytica* et *Giardia lamblia*, en utilisant la technique de la concentration de l'éther du formol. Sur les 250 échantillons analysés, 115 (46%) soit pour *Entamoeba histolytica* ou *Giardia lamblia* ou les deux à la fois. Quarante-vingt dix (36,0%) sujets étaient positifs pour *Giardia lamblia* tandis que 46 (18,4%) sujets avaient *Entamoeba histolytica*. Une infection d'une seule espèce a été observée dans 78 (67,8%) élèves infectés, tandis que 47 (40,9%) étaient infectés par les deux parasites. Le groupe d'âge (9-10 ans) avait le plus haut taux d'infection de 14 (21,5%) et 37 (56,9%) respectivement pour *G. lamblia* et *E. histolytica*. Les hommes avaient le plus haut taux d'infection (53,5%) par rapport aux femmes (46,3%). La pauvreté, l'ignorance et le manque d'hygiène de l'environnement ont été des facteurs associés à des taux enregistrés de prévalence élevée.

Mots clés: Protozoaires, Parasites, Infections, élèves, Bosso, Etat du Niger, Nigéria

INTRODUCTION

Intestinal parasitic infections (IPI) constitute a global health burden causing clinical morbidity in 450 million people, many of which are women of reproductive age and children in developing countries (1). Numerous protozoa inhabit the gastrointestinal tract of humans; the majority of them are non-pathogenic commensals. The pathogenic

protozoa such as *Giardia lamblia*, *Entamoeba histolytica* and *Blastocystis hominis* can cause severe disease under certain conditions such as severe diarrhea. *G.lamblia* and *E. histolytica* are the most common intestinal protozoa in temperate and tropical countries especially among children (2). The main modes of transmission include faecally contaminated

water, food and person to person especially with poor basic hygiene or lack of sanitation (3).

Intestinal parasitic infections have been linked with increased malnutritional anaemia, protein-energy malnutrition and growth deficit in children (4, 5). Intestinal protozoan's infestation is most common among school age children and tends to occur in high intensities among this group. This infection saps energy and lowers the receptivity of the school children thereby constituting not just a health challenge but a socioeconomic one as well. It is therefore important to evolve a surveillance mechanism that will help in the management of those that are already infected as well as monitor prospective infections in the interest of public health. This study was undertaken to investigate the prevalence of *E.histolytica* and *G. Lamblia* among primary school pupils in selected primary schools in Bosso LGA of Niger State, Nigeria hopping to assist the health policy makers to improve the control measures in order to reduce the prevalence of these infections.

MATERIALS AND METHODS

Study Area

The study area comprises of selected primary schools in Makunkele, Rafin-yashi, Tudun-fulani and Bosso all in Bosso LGA, Niger State

Study Population

The study population consist of primary school pupils (n=250) aged between 8-12 years in Bosso town, Niger State. Participants were chosen randomly from each of the selected primary schools and their bio-data were collected using a structured questionnaire.

Sample Collection

Stool samples were collected from subjects in screw capped containers and taken to the laboratory immediately for analysis. Informed consent was taken from subjects through the schools management.

Sample Analysis.

Analysis of the stool samples was done in the laboratory to check for *G.lamblia* and *E.histolytica* using formol-ether concentration technique as previously described (6).

Statistical Analysis

The data generated was analyzed for significant difference between the rate of intestinal protozoan parasites infection recorded between males and females tested during the study using chi-square test (7).

RESULTS

A total of 250 primary school pupils comprising of 135(54%) males and 115(46%) females were investigated for infection with intestinal protozoa. One hundred and thirty six (54.4%) subjects out of the 250 subjects investigated were found to be infected with single species infection was seen in 78 (67.8%) of the infected pupils, whereas 47(40.9%) were co-infected with two or more species of helminths.

The prevalence rates of infection in both males and females were highest in the age group (8-10) years with 53.5% and 46.3% respectively. These where however not statistically significantly different ($p < 0.005$).

The distributions of infections in the four selected primary schools in relation to sex and age are shown in Tables 1-3 below.

TABLE 1: OVERALL PREVALENCE OF *E.HISTOLYTICA* AND *G.LAMBLIA* AMONG AGE GROUP AND SEX

Age (Years)	Total Number Tested	Males	Number of Male Positive (%)	Females	Number of Female Positive (%)
8-9	56	32	17(53.1)	24	11(45.8)
9-10	83	45	35(77.8)	38	26(68.4)
10-11	55	30	19(63.3)	25	10(40)
11-12	56	28	13(46.4)	28	5(17.8)
Total	250	135	84(62.4)	115	52(45.2)

TABLE 2: TOTAL NUMBER OF SINGLE INFECTION FOR *G.LAMBLIA* AND *E. HISTOLYTIKA*

Age(Years)	Total Number Tested	Number Positive for <i>G. lamblia</i>	Number Positive for <i>E.histolytica</i>
8-9	56	8	24
9-10	83	14	37
10-11	55	12	23
11-12	56	6	6
Total	250	46 (18.4 %)	90 (36 %)

TABLE 3: PREVALENCE OF *E.HISTOLYTIKA* AND *G.LAMBLIA* CO-INFECTION IN THE PUPILS STUDIED

Age(Years)	Total Tested	Number	Number of Pupils Infected with both Parasites
8-9	56	5	
9-10	83	8	
10-11	55	6	
11-12	56	3	
Total	250	22(8.8%)	

DISCUSSION

The intestinal protozoa are widely distributed and infections usually vary according to immunity, region and age. An increase in the incidence of these infections is evident in low socio-economic communities with poor sanitation (8).

One hundred and thirty six (54.4%) subjects out of the 250 subjects investigated were found to be infected with either *E. histolytica* or *G. Lamblia*. The breakdown of the result revealed 90 (36.0%) and 46 (18.4%) cases of *E. histolytica* and *G.lamblia* respectively. This result is lower than the findings earlier reported (9) in Maiduguri and (10) in India for *G. lamblia* (41.4%) and (79%) respectively. *E.histolytica* however, is higher than earlier findings by (9) in Maiduguri which was about (17.6%). This may be due to the environmental conditions in India and Maiduguri and their high level of orientation about *G.lamblia*.

The high level of *E.histolytica* may be due to the high level of ignorance about this infection in the study area.

The distribution of infection on the basis of age revealed that age 8-9 years 17(53.1%) and 11(14.5%), 10-11 years 19(63.3%) and 10 (40%) for male and female respectively is more infected with this parasitic infection, it was observed in the questionnaire that this age group is ignorant of this disease, with age 9-10 (77.7% and 68.4%) having the highest number of infection. This may be due to the fact that they are the most active among these children and involved more in outdoor activities than the other age groups. Age 11-12 (46.4% and 17.8%) was not highly infected with this diseases, this may be because they are matured than the other groups and do not involve much in outdoor activities than the other age groups. It was also established from the questionnaires that this age groups are knowledgeable of this disease hence the low infectivity rate.

In this study it was observed that males had 84 (62.2%) cases of infection compared to 52 (45.2%) recorded among the females. this could be attributed to the fact that males are more involved in outdoor activities such as playing, fishing etc and are more exposed to this infection than females. This is in line with previous findings in Maiduguri (8 Biu and Adam, 2008) with males having a total of 43(70.5) and 11(18.0) and females 38 (80.9) and 8 (17.0) for *E.histolytica* and *G.lamblia* respectively. This study showed that there was difference in the prevalence rate observed among the different age groups and gender which agrees with the previous findings of 11-15

The result of this study highlights the public health challenge represented by intestinal parasitism in the study area in particular and the nation in general, and the needs to be addressed to decrease its burden on health care. The high prevalence can be attributed to poor environmental management, poor personal hygiene and lack of public health education. Public health education and improved sanitations conditions in our environment are key success to the prevention of spread of intestinal protozoan infections. In this regards the finding of this study can serve as a basis for developing strategies and preventive programs targeting group at risk of intestinal protozoan infections like school children.

CONCLUSION

It can be concluded based on this research that an overall 54% prevalence rate was found and male pupils are infected with the two protozoan parasites (62.2%) than females (45.2%).

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