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RESEARCH ARTICLE

PREVALENCE OF GASTROINTESTINAL PARASITIC INFECTION IN A SECONDARY HEALTH FACILITY IN DADIN KOWA COMMUNITY, JOS METROPOLIS, CENTRAL NIGERIA

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ABSTRACT

Objectives: This study investigated the prevalence of gastro- intestinal parasites among patients attending a secondary health care facility in Dadin Kowa community, Jos metropolis, North Central Nigeria.

Methods: Fecal samples from 300 patients were examined microscopically using formal ether concentration technique.

Results: Out of 300 stool samples examined the overall prevalence of intestinal parasites was 43(14.3%).The males had the highest with 16(16.5%) while the females had 27(13.3%).Patients in age group 21-40 years had the highest with 26(16.6%) while age group 1-20 years had the lowest with 10(11.0%).The study revealed that those patients that uses water closet system had the lowest prevalence of 3(3.0%), followed by those using pit latrines with 18(16.4%), while those that usually defecate indiscriminately in the bush/open air had the highest with 22 (24.4%). The study reveals that those with non-formal education had the highest with 18(22.5%), followed by those with primary education with 13(21.7%), those with secondary education had 7(10.0%), and those with tertiary education had the least with 5(5.6%).The study indicates that those using ponds/stream water as sources of drinking /domestic purposes had the highest with 6(60%),followed by those using well water with 34(37.8%) and the least were among those using tap/bottled water with 3(1.5%) .The gastrointestinal parasites recovered in the study area were *Entamoeba histolytica, Ascaris lumbricoides, Hookworm and Schistosoma mansoni* having a prevalence of 8.7%, 3.7%, 1.3% and 0.7% respectively.

Conclusion: The high prevalence recorded was found to be associated with poverty, illiteracy, poor water supply and poor environmental sanitation.

INTRODUCTION

Intestinal parasites are the parasites that inhabit the gastrointestinal tract of an individual that is man and even animals. These parasites are found in the gastro-intestinal tract which comprises of the oesophagus, stomach, duodenum, jejunum, ileum, caecum, colon, and the outlet anus (Bailey, 1998). Intestinal parasitic helminthes and protozoa infections are among the most common infection of humans worldwide. They occur throughout the developing world and are most common in the poorest communities (Nwosu *et al*., 2004).They are responsible for considerable morbidity and mortality (Kang *et al*., 1998). The prevalence of intestinal parasitic infection is higher in developing countries than in developed ones, this is largely due to deficiency of sanitary facilities, unsafe human waste disposal system,poverty,low socio-economic status, and inadequate and lack of safe water supply (Omudu *et al.*, 2004). Factors that favour the prevalence of gastro-intestinal parasites most especially in tropical and subtropical regions of the world include: Favourable climatic conditions; lack of political will to implement control programmes; lack of education on the route of infection; poor environmental hygiene; poor personal hygiene and indiscriminate eating habit (Azominu *et al*., 2002; Ichhpujani and Bhatia, 2005). The mode of transmission of these parasites is mostly through the oral faecal route in which case the infective stage is ingested in food, water, vegetable and hands contaminated with human faeces while the infective larva can penetrate through the unbroken skin (Magambo *et al*., 1998).

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METHODOLOGY

Study Area

The study was carried out in Comprehensive Health Centre Dadin Kowa, Jos Plateau State, Nigeria. The hospital is a secondary health care facility which serves mostly the people within the community. It is located in Jos, the state capital.

Sample Collection

Permission was granted by the authority of the Comprehensive Health Centre before the commencement of the study.A semi

Table 1. Prevalence of Gastrointestinal parasites in relation to sex

Sex	No. examined	No. Positive	Prevalence (%)
Males	97	16	16.5
Females	203	27	13.3
Total	300	43	14.3
X2= 2.837	DF= 1	P> 0.05	

Table 2. Prevalence of Gastrointestinal parasites in relation to Age

Age	No. examined	No. Positive	Prevalence (%)
1 -20	91	10	11.0
21 -40	159	26	16.6
41-60	35	5	14.3
61-80	15	2	13.3
Total	300	43	14.3
X2=31.884	DF= 3	P< 0.05	

Table 3. Prevalence of Gastrointestinal parasites in relation to type of toilet system used

Toilet system	No. examined	No. Positive	Prevalence (%)
Water closet	100	3	3.0
Bush/open air	90	22	24.4
Pit latrine	110	18	16.4
Total	300	43	14.3
X2= 14.003	DF=2	P< 0.05	

Table 4. Prevalence of Gastrointestinal parasites in relation to Educational status

Educational status	No. examined	No. Positive	Prevalence (%)
Non-formal	80	18	22.5
Primary	60	13	21.7
Secondary	70	7	10.0
Tertiary	90	5	5.6
Total	300	43	14.3
X2= 9.744	DF=3	P< 0.05	

Table 5. Prevalence of Gastrointestinal parasites in relation to source of drinking water

Source of water	No. examined	No. Positive	Prevalence (%)
Tap/bottled	200	3	1.5
Well	90	34	37.8
Pond/stream	10	6	60.0
Total	300	43	14.3
X2= 40.800	DF= 2	P< 0.05	

Table 6. Prevalence of Gastrointestinal parasites in the area

Parasites	No. examined	No. Positive	Prevalence (%)
Ascaris lumbricoides	300	11	3.7
Schistosoma mansoni	300	2	0.7
Entamoeba histolytica	300	26	8.7
Hookworm	300	4	1.3
Total	300	43	14.3
X2= 33.000	DF=3	P< 0.05	

structured questionnaire was administered randomly to consented patients to obtain vital demographic data. Three hundred (300) faecal samples were collected from Three hundred patients in a clean, wide mouth, screw capped, transparent, dry and disinfectant- free containers between October,2009 and February,2010.Early morning faecal samples were received and processed immediately.

Sample Processing

Macroscopic and microscopic examinations were carried out on all the samples. The samples were processed using saline/iodine wet mount and formol-ether concentration method for identification of characteristic ova, larva or cysts of parasites in accordance to standard procedures (Cheesbrough, 1998 and Ochei and Kolhatkar, 2007). Conclusive diagnosis was made with the identification of the characteristic eggs in the samples.

Statistical Analysis

Data obtained were analysed statistically using Chi-square. A value of $p<0.05$ was considered significant while proportion values of $p>0.05$ was not significant.

RESULTS

Out of three hundred (300) faecal samples analyzed between October, 2009 and Febraury, 2010, 43(14.3%) had cases of intestinal parasitic infection. The prevalence in relation to sex as shown in Table 1 indicates that out of 97 males screened 16(16.5%) were positive while out of 203 females screened 27(13.3%) were positive for gastrointestinal parasitism (P >0.05). This shows that males had a higher prevalence than females although there was no statistically significant association between the sexes. Table 2 shows the prevalence of gastrointestinal parasites in relation to age of patients. The result shows that age group 1-20 had a prevalence of 10(11%), age group 21-40 had 26(16.6%), age group 41-60 had 5(14.3%) and age group 61-80 had 2(13.3%).The result showed that the prevalence increases with age from 1-40 and then decreases from age group 41-80.The result showed that there is a significant relationship between the prevalence and the age groups (P< 0.05).

Table 3 shows the prevalence of gastrointestinal parasites in relation to the toilet system used by the patient. The study revealed that those patients that uses water closet system had the lowest prevalence of 3(3.0%), followed by those using pit latrines with 18(16.4%), while those that usually defeacate indiscriminately in the bush/open air had the highest prevalence with 22 (24.4%).The result indicates that the method of faecal disposition by the patients have effects on the prevalence (P< 0.05). Table 4 shows the prevalence of gastrointestinal parasites in relation to educational status. The result reveals that those with non-formal education had the highest prevalence with 18(22.5%), followed by those with primary education with 13(21.7%), those with secondary education had 7(10.0%), and those with tertiary education had the least with 5(5.6%).The result reveals that levels of educational attainment have significant effect on the prevalence of the infection (P< 0.05).

Table 5 shows the prevalence of gastrointestinal parasites in relation to sources of water supply. The result indicates that those using ponds/stream water as sources of drinking /domestic purposes had the highest prevalence with 6(60%),followed by those using well water with 34(37.8%) and the least were among those using tap/bottled water with 3(1.5%). The result showed that there is a significant relationship between the prevalence and the sources of water supply (P< 0.05). Table 6 shows the prevalence of gastrointestinal parasites in the study area in which *Entamoeba histolytica, Ascaris lumbricoides, Hookworm and Schistosoma mansoni* having a prevalence of 8.7%, 3.7%, 1.3% and0.7% respectively (P<0.05).

DISCUSSION

A total of three hundred (300) samples were screened of which 43(14.3%) had cases of intestinal parasitic infection. Although the study reveals that males had a higher prevalence than the females, there was no significant association between the prevalence and sex ($P > 0.05$). This result was in consonance with the findings of Akinbo *et al.* (2011) and Ogbuagu *et al*. (2010) who reported similar findings in Benin City, and Nnamdi Azikiwe University Teaching Hospital Anambra State, Nigeria respectively. This high prevalence associated with males may be due to the fact that they are more often engaged in predisposing activities such as farming or playing football barefooted, playing in streams or ponds and also eating of unwashed fruits with unwashed hands.

The study reveals that the prevalence of infection increases between age groups 1-40 then it started to decreases between age groups 41-80.Age group 21-40 recorded the highest. The results indicates that there was a significant relationship between the prevalence of the infection and age $P < 0.05$).This agreed with the findings of Akinbo *et al.* (2011) who reported in a similar study in Benin City, Nigeria, that there was a significant relationship between intestinal parasitic infection and age. This study reveals that those patients privilege to have water closet system had the lowest prevalence of 3(3.0%),followed by those using pit latrines with 18(16.4%),while the highest were among those who defeacate indiscriminately in the bush/open air who recorded 22(24.4%).This agreed with Ogwurike *et al.(*2010) who reported similar findings in Jos.

The study also reveals that people who had no formal education had the highest prevalence rate with18 (22.5%), followed by those with primary education who had 13(21.7%), then those with secondary education had 7(10.0%), and those who had tertiary education had the lowest with 5(5.6%).This study shows that the prevalence of parasitic infection in the area decreases with increase in educational levels. The study indicates that those using ponds/stream water as sources of drinking /domestic purposes had the highest prevalence with 6(60%),followed by those using well water with 34(37.8%) and the least were among those using tap/bottled water with 3(1.5%). This difference was statistically significant ($p<0.05$).This study agreed with the findings of Ogbuagu *et al*.(2010) in a similar work in Nnamdi Azikiwe University Teaching Hospital Nnewi,Anambra State,South East Nigeria. This study reveals that with the provision of safe water supply the prevalence rate may be reduced.

The study shows that the distribution of the gastrointestinal parasites recovered in the study area are *Entamoeba histolytica, Ascaris lumbricoides, Hookworm and Schistosoma mansoni* having a prevalence of 8.7%, 3.7%, 1.3% and0.7% respectively. *Entamoeba histolytica* had the highest while *Schistosoma mansoni* had the least. This agreed with Ogbuagu *et al*. (2010) who reported *Entamoeba histolytica* as the most prevalent parasitic infection in a similar study. While it disagreed with the findings of Dibua *et al*.(2007) who reported *Ascaris lumbricoides* as the most prevalent followed by *Entamoeba histolytica* and *Hookworm.* The reported high prevalence of the parasites in this study may be attributed to a wide contamination of the environment by indiscriminate defeacation of faecal matter thereby enhancing the transmission of gastro intestinal parasitic infection.

Conclusion

Gastrointestinal infection is common in the study area this may be associated with poverty, lack of safe water, indiscriminate defaecation, illiteracy and socio-economic or cultural beliefs. Risk factors associated with infection suggest that mass de-worming strategies with provision of safe water and health education, particularly among residents in the community will go a long way toward minimizing or eradicating gastrointestinal infection in the community.

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