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Prevalence of Intestinal Parasites in Edo State

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Abstract

Purpose: To determine the prevalence and factors responsible for the spread of intestinal parasites in Edo State and suggest strategies for their control.
Methods: This prospective and cross sectional study involved 3601 (798 males, 1002 females and 1801 children) selected randomly from the 18 local government areas of Edo State. Stool samples collected from the selected participants were analysed using standard techniques. Using a structured questionnaire, factors which disposed to increase in the prevalence of intestinal parasites were investigated between April 2007 and March 2008.
Results: High prevalence (11.3%) of intestinal parasites was recorded in the study. Those drinking well water had the highest prevalence, followed by those who used tap water and least among people who used borehole water. Infection rate was higher in children who lived in bushy surrounding and lower in children who lived in marshy surrounding. The highest infection rate of 10% was observed in chldren who lived in environments where refuse was indiscriminately disposed and lowest (2.5%) in adult males who inhabited environments where refuse was collected in dust bins. Children who ate outside their homes and with unwashed hands were more likely to be infected than adult males who ate at home.
Conclusion: There was high prevalence of parasitic infections in the State. Factors including water source, environment, method of refuse disposal, feeding pattern, sewage disposal, socio-economic status and cultural habits were identified to be contributing to parasitic infection.

Keywords: Socio-economic factors, parasitic infection, Edo state, Nigeria

Raphael M Mordi[1]

Christopher E Okaka[2]

[1]Department of Medical Microbiology University of Benin Teaching Hospital, Benin City, Edo State, Nigeria.

[2]Department of Zoology, University of Benin, Benin City, Edo State, Nigeria.

For Correspondence:

Email: raphael_mordi@yahoo.com

Introduction

Intestinal parasites are a common health problem in all the developing tropical countries of the world. Favourable climatic, socio-economic and cultural factors facilitate transmission of these parasites for the greater part of the year [1-3]. Warm and humid environment enhances embryonation, and flooding facilitates dispersal of infective stages of the intestinal parasites. The parasites create morbidity and result in the loss of effective working hours [4]. The clinical manifestations as well as the pathology, especially in the production of gastritis, peritonitis, intestinal obstruction, dysentery, diarrhea, larval-migrans, anemia, stunted growth and extra-intestinal lesions have been exhaustively discussed [5-6]. Estimates of intestinal parasites are therefore of immense importance in the surveillance of public health [7].

Incidence of intestinal parasites has been reported from different parts of Nigeria [8-13]. However most of the literature evaluated the prevalence of parasites without providing corresponding data on the influence of climatic, socio-cultural, environmental, occupational and other factors which are believed to influence the endemicity and transmission of the parasites [1-2].

In Edo State of Nigeria, the existing documentation on intestinal parasites is fragmented and uncoordinated. Hospital reports, which form the greater part of the documentation, are often on referred patients and thus, failed to give useful information as regards the prevalence, distribution and pattern of infection in the state. This purpose of this study therefore was to determine the prevalence of the parasites and highlight the influence of socio-economic and environmental factors in the spread of intestinal parasites in Edo State.

Materials and Methods

Study area

The study was conducted between April 2007 and March 2008 in all the local government areas of the Ed State. The land area is approximately 1,9794 sq km, and lies roughly between longitudes 05'04'E and 06'43'E and latitudes 05°44'N and 07°34'N. The land cuts across several ecological zones ranging from the coastal mangrove swamps in the south to woodland savanna forest in the northern parts. There is a diversity of cultures and customs which result from the multiplicity of ethnic groups. The major ethnic groups include the Bini, Esan, Igara, Owan and Etsako while the minority ethnic groups include the Urhobo, Ijaw, Itsekiri, Igbanke and Yoruba (*Source: National Census Bureau, Benin City, Edo State, Nigeria*). Occupations vary from fishing along the coastal areas to mixed crop farming in the middle and northern parts of the state. Civil servants, businessmen and petty traders are found in all the areas.

Data collection

A convenient sample of 3601 participants (798 males, 1002 females and 1801 children) were systematically selected at random from all the 18 local government areas of State. Letters explaining the aims of the survey were sent to village heads, community leaders, principals and headmasters of schools and to individual households. A visit was made to explain the benefits of the survey to the local government areas. Containers for stool were then distributed to the participants and the day for the collection of the stool samples was fixed. Each stool was examined for blood; mucus, and presence of segments of adult worms as previously described [14]. Using a questionnaire, some demographic information including age, sex, occupation, water source, environment, method of waste disposal, feeding habits, and sewage disposal were sought from the participants.

Analysis of data

The data collected were entered into a computer spreadsheet and categorized based area, type of environment, method of refuse and sewage disposal, socio-economic status and cultural affiliations, and water source. Results were subjected to statistical analysis with significance level at $P < 0.05$.

Results

Four parasites species were detected in 11.4% (410) of the participants (Table 1). *Ascaris lumbricoides,* Hookworm species, *Trichuris trichiura*, and *Enterobius vermicularis* accounted for 57%, 25%, 12.5% and 5% of the total number infected people, respectively.

Table 1: Prevalence of parasites in Edo State

Parasite	Prevalence (%)
Ascaris lumbricoides	6.5
Hookworm species	2.8
Trichuris trichiura	1.4
Enterobius vermicularis	0.6

A prevalence rate of 6.4% was recorded among children who drank well water and was followed by those who drank tap water and was least among those who used borehole water at 1.1%. Infection rate of 9.1% was recorded among children who lived in bushy surrounding and 6.4% in children who lived in mashy surrounding. bushy environment predisposed to infection.

Among the children who lived in environment where refuse was indiscriminately, a high infection rate (10%) was observed. Adults living in environments where refuse was collected in dustbins had relatively low rate of infection (2.5%). Children who ate outside their homes had a much higher prevalence rate of infection (11.4%) as compared adults (7%). Similarly, children who ate without washing their hands before eating with them (8.6%) had a higher infection rate than adults with similar behaviour (5%). A prevalent rate of 11% was recorded in children who defecated in nearby bushes and 2% in adult males and females who used pit toilets.

Discussion

The pattern of infection in this study clearly showed that the source of water, either for drinking or domestic use, was an important factor in the epidemiology of intestinal parasites. In many parts of the State, well water is often obtained from locations that may not be far away from pit latrines or waste disposal sources. Among the rural inhabitants in towns and villages, pipe-borne water is lacking and water source for drinking and domestic use for the majority of the inhabitants are restricted to well or pond water [15]. In some localities where streams or rivers remain the major source of water, people also use them both as defecation sites as well as drinking and for domestic use. This poor hygienic practice often results in pollution of water with the ova, cysts, and larvae of intestinal parasites [1]. This habit, in addition to the perennial flooding, produces a conducive condition for embryonation and dispersal of infective stages of intestinal parasites of man in the humid topics [4]. Amoebic dysentery is acquired mainly through drinking water that is polluted with cysts of *Entaemoeba histolytica*. However, it is suggested that filt flies might be more important in the transmission of protozoan cysts than water [4]. Since the pond/well water, often taken by some of the participants, are usually untreated before consumption, individuals who depended on this source of water had higher prevalence rate of intestinal parasitic infection than the those who drank tap water and water from a bore-holes.

The pattern of infection in this study stresses the influence of environment on the epidemiology of intestinal parasites. The bushy humid environment provided a conducive condition for the embryonation

and dispersal of the infective larva stages of intestinal parasites [1]. Marshy grounds formed by excessive rainfall results in saturated soil and exert checks on the embryonation and dispersal of the infective stages of some intestinal parasites [16]. The relatively low rate of helminthes infection recorded on the marshy environment in this study could therefore be due to the nature of the soil coupled with very high rainfall which floods and erodes top soil with its possible helminthes larval fauna into nearby creeks.

It was clearly demonstrated in this study that improper disposal of refuse can enhance the prevalence of intestinal parasites. This explains the significant difference in infection rate between adult males who lived in environments where refuse was collected in dustbins and children who lived in environment where refuse was dumped anywhere ($p<0.05$). This result stresses the contribution of environmental sanitation on the spread of intestinal parasites. There is therefore the need to encourage personal hygiene, clean homes, clean immediate environment which will translate into clean and healthy community [16].

The feeding habit has been shown to influence the epidemiological picture of intestinal parasitic infections. The rate of transmission of parasites which gain entry into the host by ingestion is influenced by the feeding behaviour of the host [17]. Ingestion may occur as a result of consuming improperly cooked food which contains digenean cercariae or consuming food or vegetables which are contaminated with sinfective agents such as Ascaris ova or the ova of *Ancylostoma duodenale.* The eating habits as regards eating outside and not washing hands before food predispose to risk of infection. Contacts between hands and inanimate objects harbouring infective stages of intestinal parasites can be a source of infection if such hands are in contact with the mouth [4].

Improper faecal disposal should be discouraged as it enhances the rate of parasitic infection as demonstrated in this study. Some unhygienic habits, particularly among the inhabitants of the riverine areas who use the river both as toilet and source of drinking water, require educational intervention.

Conclusion

A high prevalence of parasitic infections and possible factors which predisposed to spread of intestinal parasitic infections in Edo State have been presented in this work. AN effective educational intervention is required to address these factors which include water source, method of refuse disposal, environment, feeding pattern, sewage disposal, and unhygienic habits. Despite the so called limited resources of the State Government, safe drinking water should be considered a right for every community.

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