

Enteric Parasitic Infections amongst Cement Masons in Benin City, Edo State, Nigeria

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ABSTRACT

Background: Intestinal parasites seem to be an important public health problem, especially in developing countries as the prevailing climates are suitable for their spread.

Aims: This study was conducted to determine the prevalence of enteric parasitic infection amongst masons in Benin City, Edo State.

Methods

Settings and Design: A total of 120 cement masons in building construction sites in the metropolis and suburbs in Benin City were recruited in this study.

Materials and Methods: Faecal specimens were collected from each participant, and intestinal parasites were detected using microscopy.

Statistical Analysis: The frequency data were analysed using Chi-square (χ^2) while the risk factors were calculated using odds ratio.

Results: A prevalence of 30.8% of intestinal parasitic infection was observed amongst masons in Benin City. Length of years of work significant affected the prevalence of intestinal parasitic infection amongst masons. *Ascaris lumbricoides*, *Strongyloides stercoralis*, *Trichuris trichiura*, hookworm and *Entamoeba histolytica* were the intestinal parasites recovered, and *A. lumbricoides* was the most prevalent of all the intestinal parasites recovered amongst masons.

Conclusions: Measures to reduce the prevalence of intestinal parasitic infections amongst masons are advocated.

Key words: Benin City, intestinal parasites, masons

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INTRODUCTION

Intestinal parasites seem to be an important public health problem, especially in developing countries as the prevailing climate is suitable for their spread.^{1,2} These parasitic infections are amongst the most common infections worldwide³ and are caused by helminths and protozoans.⁴ In Sub-Saharan Africa, it is estimated that approximately 25% of the total population is infected with one or more of all intestinal parasites.⁵ Intestinal parasitic infections are endemic worldwide and have been described as the major cause of illness and diseases.⁶ These parasites can cause diseases in humans, in which the burden of these diseases often depends on communities in the tropics and subtropics.⁷ Millions of disability-adjusted life years are lost yearly as a result of which, they represent a persistent burden on social and economic development.⁸ The most common soil-transmitted helminths are *Ascaris lumbricoides*, *Trichuris*

trichiura and the hookworms, with an estimated 5.3 billion people worldwide,⁹ out of which *A. lumbricoides* and *Ancylostoma duodenale* are estimated to infect more than a billion with a high number of people in Sub-Saharan Africa.^{10,11} *Giardia intestinalis* is the most prevalent protozoan worldwide with about 200 million people infected annually.¹² *Entamoeba histolytica* is estimated to infect 40–50 million people out of which 100,000 deaths are recorded yearly.⁴ The majority of infections are associated with conditions such as reduced access to safe drinking water, adequate sanitation, personal and community hygiene, poverty, inadequate access to healthcare, prevailing climatic and environmental conditions.¹³ These conditions lay the stage for continuous transmission of intestinal parasitic infections.¹⁴ The prevalence of these parasites varies from one population to another and both between and within countries.

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Masons are those that work with stone or brick in building a house. They frequently come in contact with the infective forms of these parasites in contaminated sand in the course of using sand for mortaring. Masons are more likely to have poor personal hygiene standards that may result in pathogenic infections. Masons are predisposed to these geohelminths as they regularly come in contact with soil contaminated with the infective stage of these parasites in the course of their duty. Information is lacking on the prevalence of enteric parasitic infection amongst cement masons in Benin City, Edo State. Thus, this study aimed at determining the prevalence of enteric parasitic infection amongst masons in Benin City, Edo State.

MATERIALS AND METHODS

Study area

This study was conducted at various building construction sites in Benin City and environs.

Study population

A total of 120 cement masons in building construction sites in the metropolis and suburbs in Benin City were recruited by random sampling. Participants that recently concluded a course of antihelminthic drug as well as participants that refused consent were excluded from this study. A well-structured questionnaire bothering on the sociodemographic characteristics was administered to each participant. Informed consent was sought from each participant before the collection of specimen. The protocol for this study was approved by the Ethics and Research Committee of the Ministry of Health, Benin City, Edo State.

Specimen collection and processing

Faecal specimens were collected from each participant into clean, transparent and well-labelled universal container. The stool specimens were macroscopically examined for consistency, colour, presence of blood and mucus, presence of segment or adult intestinal parasites. Freshly produced stool samples were processed using a previously described method.¹⁵ About 1 g of faeces was emulsified in 4 ml of 10% formol-saline. The mixture was sieved through a funnel layered with gauze into a test tube. To the filtrate, 4 ml of diethyl ether was added, mixed and centrifuged at 3000 rpm for 3 min. The supernatant was discarded, and from the deposit, saline and iodine mounts were prepared and examined for the presence of intestinal parasites.

Data analysis

The frequency data were analysed using Chi-square (χ^2) while the risk factors were calculated using odds ratio. The statistical software used for the analyses was INSTAT® (GraphPAD Software Inc., La Jolla, CA, USA).

RESULTS

A total of 37 (30.8%) out of 120 masons had intestinal parasitic infection. The age group of 21–25 years had the

highest prevalence (38.9%) of intestinal parasitic infection amongst masons when compared with other age groups. However, age did not significantly affect the prevalence of intestinal parasitic infections amongst cement masons ($P = 0.7695$). Marital status, educational status, source of water and source of food did not strongly associate with the prevalence of intestinal parasitic infection amongst masons ($P > 0.05$). Length of service of masons significantly associated with the prevalence of intestinal parasitic infection ($\chi^2 = 36.510$; $P < 0.0001$) with those who have worked for over 30 years having the highest prevalence (85.7%) of intestinal parasitic infections [Table I].

The intestinal parasites recovered in this study were *A. lumbricoides*, *Strongyloides stercoralis*, *T. trichiura*, hookworm and *Entamoeba histolytica*. *A. lumbricoides* was the most prevalent (73%) intestinal parasite observed amongst masons [Table II].

DISCUSSION

Intestinal parasites are amongst the most common of all chronic human infections, occurring predominantly in areas of poverty and inadequate hygiene and sanitation in the developing world.¹⁶ The prevalence of intestinal parasites has been studied in some populations mostly children,^{17–19} HIV-infected patients^{20,21} and artisans²² all in Benin City. Data are lacking on the prevalence of intestinal parasitic infection amongst masons in Benin City, Edo State. Thus, this study was conducted to determine the prevalence of enteric parasitic infection amongst masons in Benin City, Edo State.

Patterns of intestinal parasitic infections in the population may be altered on account of changes in man behaviour and lifestyles during a time and prevalence of these varies with different geographical regions.^{22–24} An overall prevalence of 30.8% of intestinal parasitic infection was observed amongst masons in this study. The prevalence observed in this study was higher than the 5.3% observed amongst HIV-infected patients in Benin City²⁵ and 10.06% reported amongst patients in Iran.²⁶ The difference in the prevalence may be due to the type of study population used. The study of Akinbo and Omoregie²⁵ used HIV-infected patients on highly active retroviral therapy; Zebardast *et al.*²⁶ used gastrointestinal disorder patients while we used cement masons. Masons are likely to have frequent contact with contaminated sand carrying the infective forms of intestinal parasites while working on sites. This may explain the finding in this study.

Age, marital status, educational status, source of water and source of food did not significantly associate with the prevalence of intestinal parasitic infections.

The length of years of work significantly associated with the prevalence of intestinal parasitic infections as those who have worked 30 years and above had the highest prevalence (85.7%) of intestinal parasitic infections. Masons frequently

Table I: Effect of risk factors on the prevalence of intestinal parasitic infection amongst masons

Risk factor	Number tested	Number infected (%)	OR	95% CI	P
Age (years)					
16-20	10	2 (20.0)			0.7695
21-25	36	14 (38.9)			
26-30	28	7 (25.0)			
31-35	23	6 (26.1)			
36-40	15	5 (33.3)			
≥41	8	3 (38.0)			
Marital status					
Single	74	23 (31.1)	0.9701	0.4367-2.155	0.9406
Married	46	14 (30.4)			
Educational status					
None	25	9 (36.0)			0.3296
Primary	44	16 (36.4)			
Secondary	51	12 (23.5)			
Source of water					
Borehole	74	25 (33.8)	1.446	0.6394-3.268	0.4937
Rain/well	46	12 (26.1)			
Source of food					
Canteen	22	8 (36.4)			0.6054
Home	50	13 (26.0)			
Food vendor	48	16 (33.3)			
Length of service (years)					
0-10	38	8 (21.1)			0.0001
11-20	62	11 (18.0)			
≥30	21	18 (85.7)			

CI: Confidence interval, OR: Odds ratio

Table II: Frequency of intestinal parasites observed amongst cement masons

Parasite	Frequency (%)
<i>Ascaris lumbricoides</i>	27 (73.0)
<i>Strongyloides stercoralis</i>	3 (8.1)
<i>Trichuris trichiura</i>	1 (2.7)
Hookworm	1 (2.7)
<i>Entamoeba histolytica</i>	5 (13.5)

come in contact with the infective forms of these parasites in contaminated soil in the course of using sand for mortaring as the ova of *A. lumbricoides* can survive in the soil for prolonged periods as much as 10 years,²⁷ up to 2 years for infective larva of hookworm and several weeks for the cysts of *E. histolytica*.²⁸ Prolonged contact with contaminated soil may be responsible for this finding amongst masons.

A. lumbricoides, *S. stercoralis*, *T. trichiura*, hookworm and *E. histolytica* were the intestinal parasites recovered in this study. *A. lumbricoides* was the most prevalent (73.0%) of all the intestinal parasites observed in this study. The finding of *A. lumbricoides* as the most prevalent parasite in this study is in tandem with previous studies in mining area, tertiary hospitals and artisans.^{21,22,29,30}

CONCLUSIONS

An overall prevalence of 30.8% of intestinal parasitic infection was observed amongst masons in Benin City. Length of years of work significantly affected the prevalence of intestinal parasitic infection amongst masons. *A. lumbricoides*, *S. stercoralis*, *T. trichiura*, hookworm and *E. histolytica* were the intestinal parasites observed, whereas *A. lumbricoides* was the most prevalent of all the intestinal parasites recovered amongst masons. Measures to reduce the prevalence of enteric parasitic infections and its associated sequelae are advocated.

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Conflicts of interest

There are no conflicts of interest.

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