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ERRATUM:

This article was inadvertently republished under Volume 2, No. 2 (July–December 2022) following a redesign and restructuring of the journal website. The correct bibliographic designation for this article is Volume 5, No. 8 (January–June 2020), under which it was originally published. This correction affects only the volume, issue, and publication-period metadata. The article content, DOI, authorship, pagination, and publication date remain unchanged.

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FROM THE EDITORIAL DESK

You are welcome to our rejuvenated Pioneer Medical Journal. On behalf of the Publisher and the Editorial team, I apologise for the absence of the journal from the committee of journals for these past six years. It was due to circumstances beyond our control. We are back and ready to serve you better. The new edition continues with Volume 5 having stopped in Volume 4.

During the period of its absence from the stable, a reorganisation was undertaken with the appointment of a new Editor-in-Chief and the editorial team.

A website was created to interface with the public and online access is being worked on. Our web page is www.pioneermedicaljournal.com.

The editorial team promises to make the journal visible and much sought after by authors to publish articles. We are presently still publishing twice a year, and will, within the next two years publish four times a year.

We thank the Management of the hospital for support in seeing that this journal resurrected. The Editorial team also thanks the Chairman, the entire executive and members of the Medical and Dental Consultants' Association of Nigeria, Federal Medical Centre, Umuahia for their wonderful support.

Our watch word is that Pioneer Medical Journal has come to stay. Once again, thank you and God bless.

Prof Maxwell U. Anah
Editor-in-Chief

WHAT IS ON THIS EDITION

We are glad to publish several interesting topics in this edition. Most of the manuscripts are studies done in Umuahia and its environment. They are interesting and varied.

The Corona Virus disease 2019 (COVID-19) pandemic is raging and it is now the new normal as virtually all sectors have been affected. A review of this has been added. Expect more from us in the next edition.

GENERAL INFORMATION FROM THE EDITOR-IN CHIEF

ALL articles to be submitted to the email address:

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THE Pioneer Medical Journal of FMC Umuahia accepts manuscripts from Nigeria and beyond in areas of basic medical sciences; clinical sciences and related fields. Publication for now is semi-annually.

The journal expects all Manuscripts submitted to her to conform to the widely cited "*Uniform Requirements for Manuscript Submitted to Biomedical Journals*"

Papers in the following categories are accepted: Original Scientific Articles, Case Reports, Brief Communications, Letters to the Editor, and Images in Medical Practice. Review articles are usually accepted. Articles should normally not exceed 3,000 words, while for Case reports, Letters, it is 1,500 words. Images in medicine should not exceed 1,000 words.

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Competing interest should be declared.

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Publication attracts administrative cost as or approved by the MDCAN.

Yours truly,
Prof. Maxwell U. Anah

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THE PREVALENCE OF INTESTINAL HELMINTHIASIS AMONG ANTENATAL BOOKING CLINIC ATTENDEES IN THE FEDERAL MEDICAL CENTRE, UMUAHIA, ABIA STATE, NIGERIA.

Ibrahim Sumaila A.¹, Nduka Ijeoma², Nduka Enyinnaya C.¹

1. Department of Obstetrics and Gynaecology, Federal Medical Centre (FMC), Umuahia, Nigeria.

2. Department of Community Medicine, Abia State University, Uturu, Nigeria.

Correspondence to:
drecnduka@yahoo.com

ABSTRACT

Background: Intestinal helminthiasis in pregnancy is a common public health problem in sub-Saharan Africa where high prevalence rates have been reported.

Objective: To determine the prevalence of intestinal helminthiasis among antenatal booking clinic attendees in FMC Umuahia, the associated factors, and utilization of the study findings to suggest preventive measures.

Methodology: Four hundred and thirty nine antenatal booking clinic attendees in FMC Umuahia were interviewed using pretested coded questionnaires. Stool macroscopy and microscopy were done. Data collected were analysed using Statistical Package for Social Sciences (SPSS) version 17. P-value of less than 0.05 was considered statistically significant.

Results: The prevalence of intestinal helminthiasis among antenatal booking clinic attendees in FMC Umuahia was 23.5%. *Ascaris* had the highest prevalence rate (17.3%), followed by *Trichuris* (5.24%), while Hookworm had the lowest (0.91%). The prevalence rate was significantly higher ($P < 0.05$) in women with low educational status, lack of portable water supply, poor toilet facilities and poor waste disposal.

Conclusion: The prevalence of 23.5% from this study is high. Health education, good environmental hygiene and toilet facilities, safe water supply, and routine screening and deworming of all pregnant women are highly recommended in order to reduce this high prevalence and the potential materno-fetal complications that intestinal helminthiasis may cause.

Key Words: Prevalence, Helminthiasis, Antenatal Attendees, Nigeria.

INTRODUCTION

Helminthiasis is the infestation of the human body with parasitic worms and it is estimated to affect 44 million pregnancies globally each year.¹ Intestinal helminthiasis is a major public health problem that has been with humans for centuries, and has continued to cause morbidity and mortality especially in low socioeconomic populations because infection is via food-borne, water-borne or soil-borne routes. *Ascaris lumbricoides*, *Trichuris trichiura*, and Hookworm are the common intestinal helminthes in the Tropics and subtropics.²

Hookworm and *strongyloides stercoralis* infect by skin penetration and mostly affect farmers and bare footed humans in swampy areas, whereas *Trichinella spiralis* (Trichina worm) infect via undercooked meat containing the encysted larvae.³ Soil eating (geophagy) is a

form of pica involving consumption of soil or clay and this practice is common among pregnant women in sub-Saharan Africa where it is culturally and widely accepted practice, and is often regarded as a response to compulsive physiological demand during pregnancy.⁴

Hookworm and *Ascaris* contribute to iron deficiency anaemia in pregnancy as they feed on blood and cause further intestinal bleeding by releasing anticoagulant compound.⁵

Ascaris takes most of its nutrients from the partially digested host (human) food in the intestine leading to nutritional anaemia.⁵ A heavy infection sometimes leads to bowel obstruction by a bolus of worms, obstruction of bile or pancreatic duct.⁵

Physiological changes in pregnancy cause water accumulation leading to haemodilution and physiological anaemia, such that

extranutrients especially iron, are required.⁶ Nonetheless, intestinal helminthiasis in pregnancy tends to cause anaemia and decrease in serum iron that causes morbidity to mother and fetus.⁷

A survey of prevalence of helminthic infection in pregnancy in Enugu in 2002 showed a prevalence rate of 27.9%.⁸ A similar but later survey in Enugu in 2005 showed a prevalence rate of 23.6%.⁹ University college Ibadan study reported a prevalence value of 43.4%.¹⁰ Overall prevalence value of 42.4% was reported among Nomadic Fulanis in North-East Nigeria and 33.3% in Adamawa also in North eastern Nigeria.^{11,12} A multicentre study in Jos, Bauchi, Eku¹³ on helminthic infections in pregnancy reported a prevalence of 48%, with *Ascaris lumbricoides* recording the highest incidence, followed by *Trichuris trichiura*.

The prevalence of intestinal helminthiasis in pregnant women in Federal Medical Centre, Umuahia is not known, hence the need to carry out this study.

METHODOLOGY

Setting/Study Population

The study was conducted among antenatal booking clinic attendees at Federal Medical Centre (FMC) Umuahia, Abia State, Nigeria. The hospital is a 400-bed tertiary health facility serving Umuahia (the capital of Abia State), other parts of Abia State, and the neighbouring States of Imo, Enugu, Ebonyi, Akwa Ibom and Rivers State. Majority of the patients are indigenous Igbo, although the Yoruba and Hausa ethnic groups also contribute a substantial proportion of the clientele. Most of the people are civil servants, businessmen and traders.

Design

A cross-sectional analytical study was carried on 439 consenting pregnant women who were interviewed using pretested coded interviewer-administered questionnaires over a seven month period, April to October 2013. The sample size was determined using the formula¹⁴ $P(1-P)Z^2/d^2$ where P is reported

prevalence of helminthiasis in pregnancy (27.9%)⁸. Z is statistic for two-sided comparison at 95% confidence level (1.96). d is margin of error (0.05). Minimum sample size was thus calculated to be approximately 309. Giving allowance for a 10% (0.1x 309) loss to follow-up, the minimum sample size for the study was 339. A total of 500 consenting pregnant women were therefore recruited for the study, but only 439 were studied (as some could not produce stool samples and some were lost to follow-up).

Sampling Technique

Systematic sampling technique was used to select every second pregnant woman who gave consent to participate in the study in the antenatal booking clinic until the sample size was achieved. Exclusion Criteria included pregnant women who refused consent, those in first trimester, those who have used antihelminthics in index pregnancy and those with chronic medical disorders such as Sickle cell anaemia, Human Immunodeficiency Virus infection, Diabetes Mellitus, Tuberculosis.

Stool Sample Collection and Examination

Stool samples were collected from toilet bucket using wood spatula into clean wide-mouthed bottles with screw-capped covers, and sent immediately to FMC Umuahia Parasitology Laboratory for examination. Containers were given to those who could not produce stool sample, so as to present the samples by next visit. Macroscopic examination revealed the appearance, consistency, blood or mucous stains on the stool. Microscopy examination to detect ova or cysts of helminthes was carried out using wet preparation technique. In Wet Preparation Technique: a drop of normal saline was applied on one side of the glass slide and a drop of iodine on the other side. An applicator stick was used to collect a small amount of stool which was mixed with the drop of normal saline and iodine and each mixture covered with cover slip. The preparation was first examined at a magnification x40 to identify the parasite and ova.

Financial Consideration: The financing of the study was by the investigators and at no cost to the pregnant women.

Data Collection, analysis and presentation

Ethical clearance was obtained from the research and ethics committee of the hospital. Informed consent was obtained from the perspective respondents prior to the commencement of the interviews. Pretested interviewer-administered questionnaires were used by the investigators to obtain vital socio-demographic and reproductive health data. The laboratory stool analysis results were recorded. Data was analysed using SPSS Version 17. P-value of less than 0.05 was considered statistically significant.

RESULTS

Of the 439 antenatal booking clinic attendees, 103 had helminthiasis, giving a prevalence rate of 23.5% (Table 1). *Ascaris lumbricoides* was the most prevalent (17.3%), and was followed by *Trichuris trichiura* (5.24%). Hookworm was the least prevalent (0.91%).

The mean age of the respondents was 30.75 ±17.23 years, with majority of the women in the 25-32 year age group accounting for 58.9% of the total population studied (table 2)

Table 3 showed that majority (67.0%) of the infected women were of low income status. Only 7.8% and 26.2% of high and middle income women respectively were infected. Of the non-infected women 59.5%, 23.8% and 16.7% were in high, middle and low income status respectively. There was no statistical significant difference ($P>0.05$) between income status of the infected and non-infected women, thus income status was not a predisposing factor to helminthic infection.

Fifty eight (56.3%) and 49.7% of infected and non-infected women respectively used bore hole source of water as shown in table 3. Purified water was used by 39.8% and 48.8% of infected and non-infected women respectively. Very few women (3.9% of infected and 1.5% of non-infected) used stream water. No woman used pipe-borne water. There was significant difference

($P<0.05$) in the prevalence of helminthiasis and source of water supply. Water closet toilets were used by 82.5% and 95.2% of infected and non-infected women respectively, whereas 15.5% and 4.2% of infected and non-infected women respectively used open field as toilet (table 3). Pit toilet was used by 1.9% and 0.6% of infected and non-infected women. There was significant difference ($P<0.05$) in the prevalence of helminthiasis and poor toilet facility (pit and open field).

Open waste disposal containers were used by 62.1% of infected and 54.2% of non-infected women, whereas 17.5% and 37.2% of infected and non-infected women respectively used closed waste disposal containers (table 3). Open field was used for waste disposal by 20.4% and 8.6% of infected and non-infected women respectively. There was significant difference ($P<0.05$) in the prevalence of helminthiasis and waste disposal method (open field and open disposal container).

Table 3 also revealed that women with tertiary education in the infected and non-infected groups were 53.4% and 36.3% respectively, while those with secondary education were 42.7% and 61.6% respectively. Only 3.9% and 2.1% of infected and non-infected women respectively had primary education. There was significant difference ($P<0.05$) in the prevalence of the helminthic infection and low level of education. Among the grandmultipara, 4.9% were infected while 3.6% were non-infected. Sixty six percent of multipara/primipara were infected while 55.6% were non-infected. Infected nulliparas were 29.1% while the non-infected were 40.8%.

Table 1: Prevalence of Helminthiasis

Age group (years)	Percentage (%) n=439
17-24	2.10
25-32	13.44
33-40	7.74
41-48	0.22
Mean age = 30.75±17.23	

Table 2: Age Of Respondents

Age group (years)	Percentage (%) n=439
17-24	2.10
25-32	13.44
33-40	7.74
41-48	0.22
Mean age = 30.75±17.23	

TABLE 3: Sociodemographic characteristics of 439 respondents

Variable	% infected	% non- infected	X ² value	df	p-value
Formal Education					
None	0.0	0.0	11.649	2	0.003
Primary Education	3.9	2.1			
Secondary Education	42.7	61.6			
Tertiary Education	53.4	36.3			
Source of water					
Pipe-borne water	0.0	0.0	56.197	2	0.000
Bore hole water	56.3	49.7			
Purified water (SW)	24.3	48.8			
Stream	19.4	1.5			
Toilet facilities					
Pit	1.9	0.6	17.856	2	0.000
Open field	15.5	4.2			
Water closet	82.5	95.2			
Residential					
Swamp	0.0	0.0	100.0	100.0	
Warm	100.0	100.0			
Waste disposal					
Open field	20.4	8.6	19.879	2	0.000
Closed container	17.5	37.2			
Open disposal container	62.1	54.2			
Parity					

DISCUSSION

The prevalence of intestinal helminthiasis among antenatal booking clinic attendees of 23.5% noted in this study is similar to the value of 23.6% reported in Enugu⁹, but lower than the Ibadan study¹⁰ with prevalence value of 43.4%. Prevalence rates reported among nomadic Fulanis in North-East Nigeria (42.4%)¹¹ and Adamawa state (33.3%)¹² also in North eastern Nigeria, were higher than the 23.5%. Poor environmental sanitation, lack of portable water, poor sewage and waste disposal, poor general hygiene, and increase in soil contamination, are factors responsible for high prevalence of intestinal helminthiasis, and they were the same reasons for the high prevalence rate among the nomadic Fulanis in North-East Nigeria¹¹ as well as in the Adamawa¹² and Ibadan¹⁰ studies.

Ascaris lumbricoides, *Trichuris trichiura* and hookworm were the common worms identified in this study, and these have also been reported in previous Nigerian studies.⁹⁻¹³ *Ascaris lumbricoides* had the highest prevalence rate (17.3%) in this study and this was the pattern noted in previous studies.^{9,10,15,16} This may be attributed to the well protected ova of *ascaris* which can withstand drying and can survive for a very long time than those of other helminths.¹⁷

The low prevalence rate of hookworm (0.9%) in this study compared to other studies^{15,16} may be attributed to the fact that none of the respondents in this study was a farmer, since hookworm infestation is via skin penetration among farmers especially in swampy and contaminated soil.

Low educational status, unsafe sources of water, poor toilet facilities, and poor waste disposal were found in this study to be predisposing factors to helminthic infection. This corresponds with the findings of other studies.^{8,15,16} Ignorance of the disease and its pathophysiology compounded by poor environmental and general hygiene encourage the spread of intestinal helminthiasis in pregnancy.

CONCLUSION

The prevalence of intestinal helminthiasis among antenatal booking clinic attendees in FMC Umuahia is 23.5%. This prevalence can be reduced appreciably by improvement in formal education, general standard of living, environmental sanitation, personal hygiene, provision of pipe-borne water and proper sewage disposal. Health education of all pregnant women on intestinal helminthiasis and its preventive measures, as well as routine deworming of all pregnant women from the second trimester of pregnancy is recommended.

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