GSC Biological and Pharmaceutical Sciences, 2019, 06(02), 079–083

Available online at GSC Online Press Directory

GSC Biological and Pharmaceutical Sciences

e-ISSN: 2581-3250, CODEN (USA): GBPSC2

Journal homepage: https://www.gsconlinepress.com/journals/gscbps

(RESEARCH ARTICLE)

Epidemiology of intestinal helminthiasis among patients visiting the out-patient unit of the University of Abuja Teaching Hospital, Gwagwalada, Abuja

Deme Gideon Gywa [1, *], Malann Yoila David [1], Jwanse Rinpan Ishaya [2], Data Kanma Rengun [3], Binshak Nenrot Bala [4] and Lumi Enoch Bitrus [5]

[1] *Department of Biological Sciences, University of Abuja, Nigeria.*
[2] *Health and Development Support Programme, Jos, Nigeria.*
[3] *School of Environmental Science, Plateau State College of Health Technology Pankshin, Nigeria.*
[4] *Department of Medical Laboratory Science, College of Health Pankshin, Nigeria.*
[5] *Department of Science Laboratory Science, University of Jos, Nigeria.*

Publication history**:** Received on 22 November 2018; revised on 14 February 2019; accepted on 18 February 2019

Article DOI: https://doi.org/10.30574/gscbps.2019.6.2.0140

Abstract

The prevalence of intestinal helminthes infection was carried out among patients visiting the out-patient unit of University of Abuja Teaching Hospital Gwagwalada, Abuja from June to October, 2010. A total of 500 patients were examined for stool. The stools were analyzed for intestinal helminthes using formol-ether concentration technique. Out of 500 samples collected and examined, 100 (20.00%) were positive for different intestinal helminthes. *Ascaris*65.50% had the highest prevalence rate of in intestinal helminthe infection. Intestinal helminthe infection was more in males than females with a significant difference (P≤0.05). Based on age, the younger age 16-25 had more intestinal helmithes than the older 66-above with a significant difference (P≤0.05). This study underscores the implications of these infections among the populace.

Keywords: Intestinal-helminthes; Patients; University of Abuja Teaching Hospital

1. Introduction

Parasitic worms are among the most common ause of chronic infection in humans in developing countries [1].The public health importance of gastro-intestinal tract parasites cannot be overemphasized as the burden associated with worm infection is enormous [2]. Globally, there are more than 3.5 billion people that are infected with intestinal worms [3]. Of this number, the worms mostly encountered globally include; *Ascaris lumbricoides* with estimated infection rate of 807 million, *Trichuris trichiura* having 604 million estimated infection rate and Hookworms (*Ancylostoma duodenale* and *Necator americanus*) having 576 million estimated infection rate [4]. Helminthe are known to cause a lot of morbidity and socio-economic deprivation in population living in the tropics, where poor sanitary conditions provide optional environmental condition for their development and transmission [2].This study therefore seeks to investigate the status of intestinal helminthes in the target population, relate the findings to health implications and recommend necessary action.

* Corresponding author
E-mail address: demejnr@gmail.com

2. Material and methods

2.1. Study area

Gwagwalada, where the University of Abuja is located is about 40km away from the federal Capital city, between latitude 8^0 55' N and longitude 7^0 05' E. The FCT falls in the semi seasonal equatorial climate zone with associated contrasting wet and dry periods.

2.2. Collection of samples

A total of five hundred (500) samples of stool were collected from the patients visiting the out-patient unit of the University of Abuja Teaching Hospital, Abuja from June to October, 2010. The stool samples were collected in sterile grease free bottles that were numbered and properly labeled. Prior to collection of samples the sex and age of the patients from which these samples were collected were recorded. Each sample taken was fixed in 10% formalin solution and conveyed to the laboratory for further analysis.

2.3. Preparations of the stool sample

Formol-ether concentration technique procedure was used. 1 g of the faeces was mixed with physiological saline and placed in a screw-cap bottle containing 4 ml of 10% formol water. The bottle was capped and mixed by shaking for about 20seconds. Thereafter the faeces were sieved, and the sieve suspension collected in a beaker. The suspension was transferred to a tube and 3 ml of either was added and mixed and centrifuged immediately at 3000 rpm for 1 minute. The supernatant was carefully poured off leaving behind the sediment. The sediment was mixed, transferred to a slide and covered with a cover glass. The slide was examined under the microscope using first, the 10X objective followed by X40 objective to identify eggs employing the keys of [5] parasites were identified using standard text [5].

2.4. Statistical analysis

Chi-square test was used to calculate for any significant difference ($P \leq 0.05$) in prevalence of intestinal helminthe among different ages and sex.

3. Results

Table 1 Overall prevalence of intestinal helminthes infection among patients

Number of examined	Number of infected	Prevalence (%)
500	100	20.00

Table 1 shows the overall prevalence rate of intestinal helminthes among patients with a prevalence rate of 100 (20.0%).

Table 2 Monthly prevalence of intestinal helminthes infection among patients

Month	Number of examined	Number of infected
June	87	07(08.05)
July	104	07(06.73)
August	167	28(16.77)
September	93	37(39.79)
October	49	21(42.86)

The highest prevalence rate of intestinal helmithic infection rate of 42.86% was recorded in October and the lowest intestinal parasitic infection rate of 8.05% was recorded in July.

Table 3 shows that 116 ova were harvested during the study with September having the highest number 45.00 ova and the least was recorded in June and July 7 ova in both case. Within this period of study, *Ascaris* ova were found to be

highest with 76 (65.50%) while *Enterobius vermicularis* and *Strongyloides stercoralis* where least with 4 (3.50%) in both case. This study can also reveal that the prevalence rate of *Ascaris* infection increases from (42.90%) in June to (72.40%) in October while Hookworm infection decreases from (28.60%) in June to (10.30%) in October and other intestinal parasites show some irregularities in their prevalence rate.

Table 3 Ova of different intestinal helminthes among patients

Month	Number of examined	Numbers of ova/cyst	*Ascaris*	*Hookworm*	*Enterobius*	*Strongyloides*	*Trichuris*	*Taenia*
June	87	7	3(42.9%)	2(28.60%)	0	0	1(14.3%)	1(14.30%)
July	104	7	4(57.1%)	1(14.30%)	1(14.3%)	0	1(14.3%)	0
August	167	28	17(60.7%)	4(14.30%)	1(03.6%)	1(03.6%)	2(11.8%)	3 (10.7%)
September	93	45	31(68.9%)	6(13.30%)	1 (02.2%)	2 (04.4%)	4(08.9%)	1 (2.2%)
October	49	29	21(72.4%)	3(10.30%)	1 (03.4%)	1 (03.4%)	2(06.9%)	1 (3.4%)

Table 4 shows that based on age in the intestinal helmithes, the younger age group had the highest of intestinal parasitic infection of 36(23.40%). As the age advances, the rate intestinal parasite infection rate decreases, hence the least prevalence rate of intestinal infection rate of 11.40% was recorded at the age group of 66- above. However, at ($P<0.05$) there was a significant difference between the intestinal parasite infection and the age group.

Table 4 Intestinal helminthes infection among age groups

Age Group	Number examined	Numbers positive (%)
16-25	154	36(23.40)
26-35	86	18(20.90)
36-45	79	16(20.20)
46-55	91	17(18.70)
56-65	64	10(15.60)
66-above	26	3(11.50)
Total	500	100

Table 5 illustrates the highest rate of intestinal helminthes infection of 27.50% was recorded more among males compared to the females with intestinal helminthes infection rate of 10.70%. However, at $P<0.05$ there was a significant difference between intestinal parasite infection among gender.

Table 5 Intestinal helminthes among gender of patients

Gender	Number of examined	Number of positive (%)
Male	276	76 (27.50)
Female	224	24 (6.70)
Total	500	100

4. Discussion

Intestinal helminthes are endemic in sub-Saharan African and Nigeria as well, and their co-infection occurs commonly [6]. This cross-sectional study assessed the prevalence of intestinal helminthes infection. The prevalence of intestinal helminthes infections occurred at20.0% which is comparable to 16.9% prevalence rate found in the eastern part of Nigeria as reported by Chigozie [7] and 15.6% obtained in Thailand [8] but lower than the 64% obtained in the western part of Nigeria and 63% obtained in Kenya [9] in similar studies. This difference could be attributed to difference is timing of the studies, variation in personal hygiene, sanitary conditions of the various environments and seasonal variations. In the general distribution of the different intestinal helminthes infection, *Ascaris lumbricoides*, Hookworms,

Enterobius vermicularis, *Strongyloides stercoralis*, *Trichuris trichiura* and *Taenia* species were encountered in this study. *Ascaris lumbricoides*, was found to have the highest prevalence rate of 65.50%. This is possible because this parasite infective stage is known to withstand very stringent environmental conditions [10, 11]. Other parasites had Hookworm (13.80%), *Enterobius vermicularis* (3.50%), *Trichuris trichiura* (8.60%), *Strongyloides stercoralis* (3.50%), and *Taenia* with (5.20%).The highest rate of intestinal parasitic infection was recorded in dry season(October) with 59.18% and the least in the rainy season (July) with 06.73%. This is so because during dry season, most eggs of the geo-helminthes are deposited in the soil [12].

The prevalence rate of intestinal helminth infection with regards to age groups, the 16-25 age groups were found to have the highest prevalence rate 23.40%with prevalence rate reducing as age increases as 66- above of age recorded the least infection rate of 11.50% with a significant difference (P≤0.05). The reason for this may be due to the fact that the body must have developed resistant immune system to the infection because of frequent infections.

However, intestinal helminth infection was recorded more in males with 27.50% compare to the 10.70% infection rate recorded in female with a significant difference (P≤0.05). This higher prevalence among males was also in accordance with the findings of Adeyeba and Akinlabi [13]. This is because the males always engage themselves in so many activities like agriculture and other commercial activities which may predispose intestinal helminth parasite infection.

5. Conclusion

The results obtained from the study have provided baseline information on the worm burden of the target population. It can therefore be concluded that the younger ages and the male are more disposed to intestinal helminth infection. Therefore, a mass drug distribution is recommended to the target population by relevant authorities.

Compliance with ethical standards

Acknowledgments

Authors of this research are grateful to all staff of University of Abuja Teaching Hospital for assisting in sample collection, sample processing and sample analysis.

Disclosure of conflict of interest

All authors who have contributed to this work and, the preparation of the manuscript have all agreed to every part of the work and therefore, there is no conflict of interest.

Statement of ethical approval

The samples used in this study were duly collected from the individuals employed in this study through sample bottles given to the human subject. This method, to the best knowledge of the authors does not require any ethical approval since it does not involve direct collection by the researchers.

Statement of informed consent

The consent of all individuals used in this study was duly sort and obtained through the use of administered papers and, the human subjects signed.

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How to cite this article

Deme GG, Malann YD, Jwanse RI, Data KR, Binshak NB and Lumi EB. (2019). Epidemiology of intestinal helminthiasis among patients visiting the out-patient unit of the University of Abuja Teaching Hospital, Gwagwalada, Abuja. GSC Biological and Pharmaceutical Sciences, 6(2), 79-83.