Intestinal Parasite And Nutritional Status Among School Children Of Mmiata -Anam, Anambra West Local Government Area, Anambra State, Nigeria

N Orji, J Okafor, R Obi, E Ezeigbo, K Opara

Citation

N Orji, J Okafor, R Obi, E Ezeigbo, K Opara. *Intestinal Parasite And Nutritional Status Among School Children Of Mmiata - Anam, Anambra West Local Government Area, Anambra State, Nigeria*. The Internet Journal of Parasitic Diseases. 2012 Volume 5 Number 1.

Abstract

A survey of intestinal parasite and nutritional status among school children of Mmiata Anam Anambra State was carried out between June to December 2010. Stool samples were collected, questionnaire distributed and body mass index were checked using anthropometric method respectively from five hundred and eighty(580) School Children aged 3 – 18 years. The samples were transported using a transport media to our lady of Lourdes laboratory Ihiala for parasitological examination. Laboratory findings showed that 339 (58.5°/$_o$) School Children were infected with one Parasite or the other. The body mass index (BMI) investigated showed that 397 (68.4°/$_o$) were malnourished while 183 children (31.6 °/$_o$) were nourished. The highest prevalence could be attributed to factors such as poor environmental sanitation, contaminated food, poor personal hygiene, inadequate disposal facilities and poverty. Analysis of the data showed a significant variation (P > 0.05) in infection rate among the nourished and malnourished. This study establishes the parasite infection versus nutritional status of school children in Mmiata Anam, Anambra State Nigeria.

INTRODUCTION

Intestinal parasite is a disabling, painful, debilitating disease with multiple adverse consequences on health, agriculture, school attendance, religious activities and overall quality of life of the affected communities (Smith; 1997) The main causative agent observed were A. lumbricoides Trichuris trichura, hookworm as well as protozoa E. histolytica, E. coli. It is among the most common infections worldwide.

However, the prevalence of intestinal parasitic infections varied considerably from place to place in relation to the pattern of transmission of the disease.

Current estimates by WHO showed that about 3.5 billion people are infected with intestinal parasites, 450 million were ill, majority of which are children. It is found to be the major causes of mortality in developing world, though the risk factor are not well characterized (Smith, 1997). Fifty percent of children in developing countries were infected annually by at least one type of soil transmitted nematode and orally acquired helminthes and Protozoan (Glewwe, 2001).

In the developed world, they represent a threat to those undergoing immunosuppressive therapy or suffering from HIV (Human Immuno Virus) infection (Estambale and Knight, 1992).

Although, in Nigeria the Federal Government has shown remarkable progress in reducing the infection, but it was found that there is no available publication in school children infected with this parasite from Mmiata Anam, Anambra State. It is the intention of this study to fill this gap. From this view point, it becomes necessary to educate the populace on the need to ascertain the quality of drinks, food and their mode of dressing especially on children in the environment to avoid intestinal parasitism.

MATERIALS AND METHODS

STUDY AREA

This study was carried out in Mmiata Anam, a remote (rural) community in Anambra west Local Government Area (LGA), in Anambra State, Nigeria. The research was carried out between June and December, 2010. It is geographically located between latitude 0610' and 0.7 20 ^{I} N and longitude 06.45 ^{I} and 0651 ^{I} E. The local government Area was formally called Mba Mimili (the land of water). Anambra

west L.G.A were made up of Anam (Igbo) and Igala Speaking people who share land mass of 518 km.

Mmiata Anam is a remote area that lack basic infrastructural facilities like road, safe water, electricity and poor health care services. This also affected the lives of workers that are posted there which makes them to come to work once in two weeks due to transportation barrier. Their main occupation is fishing, their community is surrounded with water. The women engage in farming and petty trading to support the family, while their men are mostly full time farmers. They usually involves in cultivation of crops such as yam, rice, cassava etc. and few cash crops such as palm oil. Basically there is no modern or manufacturing industry in the entire L.G.A.

There is no secondary school, they have two primary school which are community primary school and Umuonura primary school Mmiata Anam. They have two health centers.

[

SAMPLE COLLECTION

Preliminary visits were made to the two head teachers of the two primary schools available for the study to secure the necessary approval, co-operation and support needed for the study.

A total of five hundred and eighty pupils between 3-18yers were randomly selected from two primary schools. Initially they were interviewed and anthropometric method was used to assess them based on their weight, height and arm circumference. After which stool sample containers were distributed to them to use and collect the stool. They were instructed on how to collect the sample while those below the age collected theirs through the help of their mother. All samples collected were taken to the laboratory for proper analysis.

SAMPLE PROCESSING

Macroscopic Examination: The faecal samples collected were thoroughly examined for presence of adult helminthes, consistency, and bloodstain mucous (cheesbrough, 2005).

MICROSCOPIC EXAMINATION

Direct Wet Mount Method: One drop of normal saline and lugol's iodine were placed at both ends of the same slide respectively. An applicator stick was used to pick up a portion of the faecal sample and mixed with both normal saline and lugol's iodine. Then a fecal smear of about 5kobo size was made. The samples were carefully covered with cover slips to avoid air bubbles. Microscopic examination of the faecal sample was first done using x10 and x40 objectives respectively (Crompton, 1992).

Concentration Method: This was done according to the method described by (Hansen, 1990). This methods enables detection of parasites eggs and larvae through concentration by sedimentation. About 1gm of faeces and 10ml of 1 $^{o}/_{o}$ formation were mixed and stirred, until a cloudy suspension was formed, with gauze fitted into a funnel placed on top of centrifuge tube. Then 3ml of ether were dispensed into the filtrate. The mixture were mixed thoroughly using a glass rod and centrifuged for 3mins. The supernatant of debris and formalin-ether were gently descanted remaining only the sediments. The sediments were agitated, and a drop of it placed on a clean grease free slides and covered with cover slip and then examined under the microscope.

STATISTICAL ANALYSIS

Chi-Square (x^2) statistical test were used, to check the relationship between intestinal parasites and nutritional status, age, sex and behavourial concept.

eq1

RESULTS

A total of 580 school children were screened for intestinal parasite infection amongst the nourished and malnourished (nutritional status). Of the total number examined, 339 (58.5 $^{o}/_{o}$) were infected with different types of parasites while 397 (68.5/) were malnourished and 183(31.6/) nourished respectively. Chi-square analysis showed that there was a significant variation in infection rate among the nourished and malnourished group ($P > 0.05$), Table 1. Table 2, showed anthropometric measurements amongst different age groups. The weights and height obtained from them were compared with WHO standard and then grouped as nourished and malnourished. Table 3, depicts the age-related prevalence of parasitic infection among the malnourished children (group A). Of 397 Children examined, children from 7-10yrs had the highest prevalence of 92 (33.6/) while children from 3-6yrs had the least with 50 (18.3/). Individual parasitic infection varied with age. Ascaris lumbricoides infection had highest prevalence.

The age –related prevalence of parasitic infection among the nourished children (group B) were shown in Table 4. Of the

188 children examined for parasitic infection, Children between 7-10 years also had the highest prevalence of 25 (39/) while individual within the age bracket of 15-18years had the least with 10 (15/). Ascaris lumbricoides also had the highest prevalence infection.

Table 5&6 depicts the sex-related prevalence among the nourished and malnourished. Results obtained in both tables showed that female had more intestinal parasitic infections. Chi-Square analysis also showed significant variation in infection rate amongst both sexes ($P < 0.05$).

Figure 1

TABLE 1: Prevalence Of Intestinal Parasite Amongst Nourished And Malnourished Children In The Study Area.

Classification	No Examined (%)	No Infected (%)
malnourished	397 (68.4)	274 (69.0)
Nourished	183 (31.6)	65 (35.5)
Total	580	339 (58.5)

Key: Group A (Malnourished)
Group B (Nourished)

Figure 2

TABLE 2: Average Body Weight In Kilogram According To Age Group

Age range	W.H.O Standard (kg)	Group A (malnourished) (kg)	Group B (Nourished) (kg)
3-6	10.7	7.4	10.8
7-10	18.3	14.1	19.1
11-14	28.6	24.0	30.0
15-18	40.6	35.2	41.6

Figure 3

TABLE 3: Average Height In Feet According To Age Range

Age range	W.H.O Standard	Group A (feet) (malnourished)	Group B (feet) (Nourished)
3-6	3.1	2.5	3.2
7-10	3.9	3.0	3.9
11-14	4.7	4.1	4.8
15-18	5.6	4.8	5.5

Figure 4

TABLE 4: Age Related Prevalence Of Intestinal Parasite Infection Amongst The Malnourished Children

Age range	No examined	% No infected	(%) H.S	(%) T.So	(%) A.L	(%) T.T	(%) S.S	(%) T.Sa	(%) E.H	(%) G.L
3-6	70	30(18.3)	3(5)	2(11.8)	14(19.7)	8(16.7)	2(18.2)	1(6.7)	17(40.5)	5(21.7)
7-10	142	92(33.6)	18(30.5)	6(35.3)	25(35)	10(27.8)	6(5.4)	8(53.3)	10(23.8)	9(39.1)
11-14	100	70(25.6)	20(33.8)	5(29.4)	18(25.4)	12(33.3)	2(18.2)	1(6.7)	7(16.7)	5(21.7)
15-18	85	62(22.6)	18(30.5)	4(23.5)	4(19.7)	8(22.2)	1(9.1)	5(33.3)	8(19.1)	4(17.4)
Total (%)	397	274	59(21.5)	17(62)	71(25.9)	36(13.1)	11(4)	15(5.5)	42(5.5)	23(8.4)

KEYS:-
H.S = *Hookworm species*
T.So = *Teania solium*
A.L = *Ascaris lumbricoides*
T.T = *Trichuris trichiura*
S.S = *Strongyloides stercoralis*
T.Sa = *Teania saginata*
E.H = *Entamoeba histolytica*
G.L = *Gardia lamblia*

Figure 5

TABLE 5: Age Related Prevalence Of Intestinal Infection Amongst The Nourished Children (Group B)

Age range	No examined	No infected	(%) H.S	(%) A.S	(%) T.T	(%) S.S	(%) T.S	(%) E.H	(%) G.L	(%) T.S
3-6	31	13(23.4)	3(23.4)	6(24)	1(16.7)	-	3(15)	-	-	-
7-10	65	25(39)	5(38.5)	10(40)	2(33.3)	1(25)	5(46)	-	2(40)	-
11-14	51	17(26)	3(23.4)	(5(20)	2(33.3)	2(50)	3(25)		2(40)	-
15-18	36	10(15)	2(15.4)	4(16)	1(16.7)	1(25)	1(8.3)	-	1(20)	-
Total (%)	183	65(100)	13(20)	25(39)	6(9)	4(6)	12(18.3)	-	5(8)	-

Figure 6

TABLE 6: Sex Related Prevalence Of Intestinal Parasite Amongst Malnourished (Group A)

Sex	Male	% Male	Female	% Female
Parasite				
Hookworm spp	26	20.3	33	22.6
A. lumbricoides	29	22.7	42	28.8
T.trichura	18	14.7	18	12.3
S.stercoralis	5	3.9	7	4.8
T.solum	8	6.2	19	6.2
T.saginata	7	3.9	7	4.8
E. histolytica	23	18.0	11	13.0
G. lamblia	12	9.3	11	7.5
Total (%)	128(46.7)	100	146(53.3)	100

KEYS
Malnourished = Group A
Nourished = Group B

Figure 7

TABLE 7: Sex-Related Prevalence In Group B

Sex (%)	Male	% Male	Female	% Female
Parasite				
Hookworm spp	7	23.3	8	22.9
A. lumbricoides	10	33.3	12	34.3
T.trichura	3	10.0	3	8.6
S.stercoralis	4	13.3	4	11.4
T.saginata	-	-	-	-
E. histolytica	3	10	5	14.3
G. lamblia	3	10	3	8.6
T.solum	-	-	-	-
Total (%)	30(46.2)	100	35(53.8)	100

KEY
Malnourished = Group A
Nourished = Group B

DISCUSSION

The result of this study showed the presence of parasitic infections in the study area. The malnourished subjects had higher prevalence rate of the parasitic infection in the area. The result obtained agreed with Glewwe (2001) which said that Chronic Malnourishment due to intestinal parasitic infection can lead to stunted growth and loss of weight which also affects the immune system. Chi Square analysis depicts that there is significant variation.

The study has shown that subjects within the age range of 7-10years had the highest prevalence rate, in both the nourished 25 (39%) and malnourished 92(33.6%)

respectively. This revelation, was in contrast with the WHO's global Database which estimates that Children under 5years were more infected. There was also a significant variation.

Sex-wise, more females were infected than males in both nourished and malnourished. This trend might result from the fact that females are more exposed to infection, because of their attachment to their mother, they tend to accompany them to their farmland or to their shops were they play with soil. This observation do not agree with Mbanugo(2002), which states that gender influences malnutrition, since male have a better nutritional status than female, that in our culture food are unevenly distributed among both sexes because of the traditional believe which makes male to eat healthier part of meat like Chicken, while female eats the non nutritional part.

From the research, it was also observed that more than one parasite infection occur per person. According to Crompton (1992), stunting depends on the number of parasite per person and it's effect can be reversed when the child feeds properly.

In conclusion, appropriate control-measures should be taken care of in the study area. The Government should intervene by providing the basic amenities in the area, also adopting the integrated control measures in the total eradication of these parasite infections. The exposure of the individual to risk of infection should be reviewed because it's as a result of poverty and want, socio-economic status etc. Beside these individual will constitute foci of infection to the public thereby throwing the public health of the community into jeopardy.

A well articulated health educational progromme with emphasis on personal and community responsibility at making the environment ecologically unconducive for the spread of the parasites and improving their personal hygiene could from a subject of preaching in the community.

References

1. Chessbrough; M. (2005). Medical Laboratory manual for tropical countries. 2nd edition, University press Cambridge, pp 200-357
2. Crompton; D.W.T. (1992). Ascariasis and Children malnutrition. Transaction of the Royal society of tropical medicine and hygiene 86:577-579
3. Estambale; B and Knight; R. (1992) Protozoan infections and HIV-infection: a Review. E. Afr Med. J. 69: 373-377
4. Glewwe; P.K (2001) The impact of early childhood nutritional status.
5. Mbanugo; J.I. (2002). Gender influence on malnourishment. Nigerian Journal of Parasitology. 28:56-60
6. Smith, L.A (1997). Still around and still dangerous Giardia lamblia and Entamoeba histolytica, Clinical Laboratory Science 10(5): 279-286

Author Information

N.M Orji
Department of Biological Science, Anambra State University

J.E Okafor
Department of Biological Science, Anambra State University

R.K. Obi
Department of Microbiology, Federal University of Technology

E.U Ezeigbo
Department of Animal and Environment Biology, Evans Enwerem University

K.N Opara
Department of Public Health, Federal University of Technology