

HUMAN INTESTINAL PARASITISM IN A RURAL SETTLEMENT OF NORTHERN NIGERIA, A SURVEY.

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ABSTRACT

Intestinal parasites are still a common feature among our communities. This study was set out to ascertain this. One hundred and fifty respondents were recruited into the study. A pretested questionnaire was administered to the respondents with specific hygienic components such as: sources of drinking water, methods of sewage disposal and water purification among others. Stool samples were collected and analysed microscopically and findings analysed.

The overall prevalence of intestinal parasites in Mbangough community was 62%(96 out of 150). The commonest parasite encountered was *Ascaris lumbricoides* (44%), followed by *Enterobius vermicularis* (14%) and *Entamoeba histolytica* (11.3%). Other parasites were *Entamoeba coli* 3.3%, Hookworm 6.0%, *Schistosoma mansoni* 1.3%, *Taenia* species 7.3%, while the least common parasite encountered was *Strongyloides stercoralis* 0.6%. None of the respondents had access to pipe borne water or bore hole.

The prevalence of intestinal parasites in Mbangough community is still quite high. Government should invigorate in her pursuit towards the provision of primary health care facilities in our communities Also health education should be made a compulsory course in all primary schools as well as all adult and literacy classes

INTRODUCTION

Infections are regarded by World Health Organisation (WHO) as the foremost cause of morbidity and mortality among humans (1). Parasitic infections and infestations constitute quite an integral part of this estimate (2). Intestinal parasites continue to ravage both the tropical and subtropical regions of the world (3) despite various efforts employed by governments and organizations worldwide to curtail this menace (4). Among Africans and Nigerians, it is common to find in stool, parasites such as *Enterobius vermicularis*, Hookworm (*Ancylostoma duodenale* and *Necator Americanus*), *Ascaris lumbricoides*, *Entamoeba* and *Taenia* species (5).

These parasitic infections could lead to diseases such as anaemia, retarded growth and intestinal obstruction, but to mention a few (6). Their spread is heavily dependent on various socio-cultural practices such as: sources of drinking water (7), modes of preparation/ processing of food and methods of sewage disposal (8) among others.

This study was designed to find out the prevalence of intestinal parasites in Mbangough community and the level of availability of

Primary health care facilities. The findings from this study will be a good pointer as concerns the degree of observance of basic hygienic tenets of the people of this community. In like manner, these findings will be used to assess the level of success achieved by government in the implementation of ongoing National Primary Health Care policy in this locality in particular and that of Nigeria in general.

MATERIALS AND METHODS

Study Area: The study was carried out at Mbangough community, a settlement in South Eastern Ushongu Local government area of Benue State. It has a land surface area of about 28.2 KM² and circumference of about 18.8 KM. Her population is estimated at 3,800 based on 1991 population census. It is estimated to have about 340 households (household = a man, his wives, children and other dependents), and each household averagely has 9 persons (range 2 to 32). All the inhabitants are of Tiv ethnic extraction and over 96% of them are peasant farmers.

Study Design: The study was carried out in Mbangough community. Households were selected by a predetermined random sampling procedure where one after another household

was selected in each direction faced. Individuals were recruited using simple random sampling method with the aid of blind folded paper and statistical table of random numbers. A pre-tested structured questionnaire was interviewer administered to 150 respondents. Appropriate information such as age, sex, source of water supply, methods of sewage disposal and water purification methods were obtained. Informants

Analysis of Results. The results were analysed using Epi Info statistical software version 2002 where applicable. Chi square (X^2) was used to compare association among proportions, while P values < 0.05 were considered significant.

Ethical Considerations: Ethical approval for the study was dully sought and approval obtained. Similarly, consent was obtained from each respondent

RESULTS

Out of 150 respondents recruited into the study, 64(42.7%) were males while 86(57.3%) were females. The overall prevalence of intestinal parasites in Mbangough community was 62%(93 out of 150). The prevalence among males was 25.4%(38 out of 150) and that among females was 36%(54 out of 150). The male female difference was not statistically significant ($X^2 = 0.33$, $P > 0.05$).The highest prevalence of 16.6%

of first degree relations were used in case of children.

Procedure: Samples were collected into special bottles and transported immediately to the health centre for processing. Normal saline and then iodine preparations were carried out on each stool sample without concentration procedure. Microscopy was carried out using X5, X10 and occasionally X40 objectives.

(25 out of 150) was recorded among the 10-19 age range. The combined prevalence of intestinal parasites among the age range 1 to 19 was significantly higher than the older ages of 50 years and above ($X^2 = 6.68$, $P = 0.009$), Table I.

Table II shows the prevalence of intestinal parasites identified among the residents of Mbangough community. The commonest intestinal parasite identified in the community was *Ascaris lumbricoides* which infested 66 subjects (44%). This was followed by *Enterobius vermicularis* 14.0%(21 out of 150) and then *Entamoeba histolytica* 11.3% (17 out of 150), while the least common parasite encountered was *Strongyloides stercoralis* 0.6% (1 out 150). There were several instances of multiple parasitic infestation.

Table III shows the pattern of multiple parasitic infestation. Only a single parasite was found in

76 subjects (81.7%), two parasites in 16 subjects 17.2% and three parasites in 1 subject (1.1%).

Table IV analyses the methods of sewage disposal and sources of water supply in the community. Eighty nine respondents (59.3%) use pit latrines while 61(40.6%) use open air

defaecation. None of the inhabitants of the community uses pipe borne water or bore hole since all of them derive their water from wells and streams. None of them boil their water before drinking.

Table I: Age and sex distribution of intestinal parasites among the people of Mbangough community of Benue state.

Age(Years)	MALE		FEMALE		TOTAL
	Negative	Positive	Negative	Positive	
1-9	3(2.0)	9(6.0)	3(2.0)	6(4.0)	21(14.0)
10-19	5(3.3)	14(9.3)	5(3.3)	11(7.3)	35(23.3)
20-29	7(4.6)	4(2.7)	6(4.0)	17(11.4)	34(22.7)
30-39	3(2.0)	3(2.0)	1(0.6)	4(2.7)	11(7.3)
40-49	3(2.0)	6(4.0)	4(2.6)	8(5.3)	21(14.0)
50-59	4(2.7)	1(0.6)	3(2.0)	8(5.3)	16(10.7)
60& Above	1(0.7)	1(0.6)	10(6.6)	0(0)	12(8.0)
TOTAL	26(17.3)	38(25.4)	32(21.3)	54(36)	150(100)

Parenthesis = Percent.

$\chi^2 = 0.33$

P > 0.05

Table II: Prevalence of intestinal parasites among inhabitants of Mbangough community of Benue state. N =150

Parasite	Number Positive	% Infection
<i>Entamoeba histolytica</i>	17	11.3
<i>Entamoeba coli</i>	8	5.3
<i>Enterobius vermicularis</i>	21	14.0
<i>Ascaris lumbricoides</i>	66	44.0
Hookworm	9	6.0
<i>Schistosoma mansoni</i>	3	1.3
<i>Taenia species</i>	11	7.3
<i>Strongyloides stercoralis</i>	1	0.6
<i>Trichuris trichura</i>	0	0
TOTAL	93	62

Table III: Distribution of intestinal parasites among residents of Mbangough community by the number of species of parasites per stool sample.

Number of species per stool sample		
No. Species/Sample	Total Number	Percent (%)
One Species	76	81.7
Two Species	16	17.2
Three Species	1	1.1
Four Species	0	0
TOTAL	93	100

Table IV: Assessment of the sources of water supply and methods of sewage disposal among residents of Mbangough community.

Sewage Disposal		Methods	
Water Systems/Latrines	Pit	Open Air	Air Defaecation
Number	%	Number	%
89	59.3	61	40.6

DISCUSSION

The prevalence of intestinal parasitism in Sources Of Water Supply Mbangough community was found to be 62%. This finding is quite high but compares favourably with the findings of Salako (9) in his study among primary school children in Lagos.

This further buttresses the fact that parasitic infection and infestation is still an issue of serious public health importance in Nigeria.

The commonest parasite encountered in this study was *Ascaris lumbricoides* (44%) which was followed by *Enterobius vermicularis*(14%). This is similar to earlier studies in Lagos (9), Brazilian Amazon (10), and Kenyan coast (11). Findings from other centres such as Oman emirate (12), hookworm infection was the commonest organism while findings from Santo Brazil(13) showed *Strongyloides stercoralis* as the commonest organism among alcoholics.

Nutritional status in concert with other external factors such as standard of hygiene could play a significant role in this high prevalence of intestinal parasitism.

Findings from Bangladesh (14) showed a strong relationship between vitamin A, Iron status and helminthiasis. Findings from other parts of the world (15-17) concur with this view. The prevalence of intestinal parasitism was less in the older age group possibly due to higher level of awareness for the need to maintain good hygienic practices.

Twenty-three persons had two parasites in stool while (7) persons had three parasites in stool. Salako (9) in Lagos, Ashford¹¹ in Kenya, Ashford (18) in Kenya and Higgins(19) in Indonesia also demonstrated this polyparasitism as a common feature in tropical and subtropical

parts of the world. The influence of nutrition could be an important factor in multiple parasitic infestations as demonstrated by Tanner (20) among rural children in Tanzania.

There is lack of portable drinking water in the community and about 40% of the inhabitants result to open air defaecation. These are well known unhygienic practices that promote the spread of infections in our localities. This is coupled with the fact that less than 5% of the community population boils their water before drinking. Salako (9) who recorded a 70.6% prevalence of intestinal parasitism in a population that lacked these facilities also emphasized the contributions of these factors towards the spread of intestinal parasites. Okpala (4) in an earlier study in Lagos recorded a much higher figure of 85.1% prevalence of intestinal parasites among (44) schools in Lagos with varying degrees of sanitary conditions.

The Alma-Ata international conference on primary health care held on 12th September 1948 in the Soviet Union was meant to provide primary health care for all communities of the earth. The target year of accomplishment was 2000 AD. However, findings from this and other contemporary studies is a far cry from near achievement even at 5 years behind the target

schedule. Some of the resolutions of Alma-Ata declarations include the following among others: standard sewage disposal facilities for all and unrestricted availability and accessibility to basic health facilities.

The success of that Russian conference is now put to question going by the poor rating of primary health care indices in Nigerian communities, other parts of Africa and beyond.

CONCLUSION

This study has found out that primary health care in our communities is still at very low ebb compared to the developed parts of the world. 78 has failed, posterity has given the "New millennium development goal" (MDG) with a target year of 2015 AD to reduce the world's poverty by half. We therefore call on various

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2. Geneva 1989.
3. Gilles, H. M. *Epidemiology and control of tropical diseases*. W. B. Saunders Co. 1986; 755p.
4. Kilama, W. L. Hookworm infection and disease in Africa and the middle east. In

Provision of portable water for all communities irrespective of location, provision of The teaching of health education in our primary schools in the urban and most especially in the rural communities should be reemphasized. The curriculum should be reviewed where it exists to meet the contemporary needs of basic hygiene in our society. As a matter of necessity, this should be extended to all adult vocational and literacy classes. This will no doubt elevate the people's knowledge and awareness about the basic tenets of good hygiene both at personal and community levels. Although Alma-Ata tiers of government, international and local organizations to this great challenge to achieve this 7 years ahead of time.

REFERENCES

1. Voughan, J. P., Morrow, R. H. *Manual of Epidemiology for district health managers*. WHO, Hookworm disease, eds. Schodi G. A. and Warren K. S: London: Taylor and Francis. 1990; pp17-32.
5. Okpala, I. The incidence of intestinal parasites among school children in

- Lagos (Nigeria). *West Afr. Med. J.* 1956; 5: S167.
6. Feachem, R. G., Guy, M. W and Harrison H. P. et al. Excreted disposal facilities and Intestinal parasitism in urban Africa. Preliminary studies in Botswana, Ghana and Zambia. *Trans-Roy-Soc. Trop. Med. & Hyg.* 1983; 77(4): 515-521.
 7. Keusch, G. T., and Migasena, P. Biological implications of polyparasitism. *Rev. Infect. Dis.* 1982; 4: 880- 882.
 8. Ogbonna, C., Okolo, S. N and Okonji, M. C. Intestinal worms and nutritional status of under-fives in Jos, Nigeria: Any relationship? *Nig. J. Clin. Prac.* 2004; 7(2): 79-81.
 9. Rowland, M. G. M., Paul, A. and Prentice, A. M. et al. Seasonal aspects of factors relating to infant growth in a rural Gambian village. Paper presented at the IDS/Ross Institute conference: Seasonal dimensions to rural poverty, July 1978.
 10. Salako, A. A. Effects of portable water availability on intestinal parasitism among rural school children with sewage disposal facilities in the Mjidun and Owutu sub-urban community of Lagos state. *Nig. Med. Practi.* 2001; 39(3/4): 30- 35.
 11. Ferraz, E. and Thatcher, V. E. Parasitic infections in villagers from three districts of the Brazilian Amazon. *Ann. Trop. Med. & Parasitol.* 1998; 92(1): 79- 87.
 12. Ashford, R. W., Craig, P. S. and Oppenheimer, S. J. Polyparasitism on the Kenyan coast I. Prevalence and Associations between parasitic infections. *Ann. Trop. Med. & Parasitol.* 1992; 75: 269- 279.
 13. Idris, M. A., Ruppel, A. and De Carnerl, I. et al. High prevalence and intensity of Hookworm infection in the Dhofar Governorate, Oman. *Ann. Trop. Med. & Parasitol.* 1993; 87(4): 421- 424.
 14. Zago – Gomes, M. P., Aikawa, K. K. and Perazzio, S. F. et al. Prevalence of intestinal nematodes in alcoholic patients. *Rev. Soc. Brazil Medic Trop.* 2002; 35(6): 571- 574.
 15. Persson, V., Ahmed, F. and Gebre-Medhin, M. et al. Relationships between vitamin A, Iron status and

- helminthiasis in Bangladeshi school children. *Public Health Nutrition*. 2000; 3: 83- 89.
16. Hall, A. Intestinal parasitic worms and the growth of children. *Trans-Roy-Soc. Trop. Med. & Hyg.* 1993; 87: 241- 242.
 17. Gupta, M. C., Mithal, S. and Arora, K. L. et al. Effects of periodic deworming on nutritional status of *Ascaris* infested preschool children receiving supplementary food. *The Lancet*. 1977; 16: 108- 110.
 18. Finkelman, F. D., Shea-Donahue, T. and Goldhill, J. Cytokine regulation of host defence against parasitic gastrointestinal nematodes. Lessons from studies with rodent models. *Annual review of Immunology*. 1997; 15: 505- 533.
 19. Ashford, R. W., Craig, P. S. and Oppenheimer, S. J. Polyparasitism on the Kenyan coast II. Spatial heterogeneity in parasitic distributions. *Ann. Trop. Med. & Parasitol*. 1993; 87(3): 283- 293.
 20. Higgins, D. A., Jenkins, D. J. and Kurniawan, L. et al. Human intestinal parasitism in three areas of Indonesia: a survey. *Ann. Trop. Med. & Parasitol*. 1984; 78: 637- 663.
 21. Tanner, M., Burnier, E. and Mayombana, C. et al. Longitudinal study on the health status of children in a rural Tanzanian community. *Parasitoses and Nutrition following control measures against intestinal parasites. Acta. Tropica*. 1987; 44: 137- 174.
 22. Mc. Mahan, R. On being in charge. A guide for middle management in primary health care. W. H. O. Geneva, 1980.