

Malaria Parasitemia in Anambra East Local Government Area of Anambra State, Nigeria

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ABSTRACT

Malaria is quite possibly the main general medical issues in Nigeria which can be transmitted through the bites of infected female Anopheles as a result of bushy environment, stagnant water or poor housing condition and sometimes nearness to water bodies. This study is aimed at studying malaria parasitemia in Anambra East Local Government Area. The malaria parasitemia in four communities of Anambra East Local Government Area LGA was carried out using standard parasitological techniques for rapid assessment of malaria infection and level of parasitemia. Results showed an overall malaria parasitemia of 22.3%, where 49 participants out of 220 participants were positive. Community based malaria parasitemia of 13(5.9%) in Nando, 12(5.5%) in Umuoba-Anam, 9(4.1%) in Nsugbe and 8(3.6%) in Umueri. The four different communities recorded variations in malaria parasitemia. There should be intensified efforts to continuously educate the masses on all the strategies of malaria prevention.

KEYWORDS: Malaria, Malaria Parasitemia, parasitological, prevention, Anambra State

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1. INTRODUCTION

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. Malaria is brought about by single-celled microorganisms of the Plasmodium bunch and the illness is most usually spread by a contaminated female Anopheles mosquito. The mosquito nibble presents the parasites from the mosquito's spit into an individual's blood. The parasites travel to the liver where they develop and imitate (Caraballo, 2014). Five types of Plasmodium can taint and be spread by people (Caraballo, 2014). Most passings are brought about by P. falciparum, while P. vivax, P. ovale, and P. malariae for the most part cause a milder type of

malaria (Caraballo, 2014). The species P. knowlesi once in a while causes infection in people. Malaria causes signs that ordinarily fuse fever, lethargy, hurling and headaches (Caraballo, 2014).

As of 2004, 107 nations and regions have announced malaria transmission. It is assessed that overall around 3.2 billion individuals are in danger of malaria disease (Korenromp, et. al, 2005). WHO gauge that 350-500 million clinical cases and more than 1 million passings from malaria happen worldwide every year (Korenromp, et. al, 2005). Malaria transmission is generally dispersed and happens in nations of Africa, Asia, Central and South America, the Middle East and Oceania. Be that as it may,

critical topographical variety in bleakness and mortality exists among nations and districts where malaria transmission exists. An assessed 200,000 infant passings happen every year because of malaria disease during pregnancy.

The danger of infection can be diminished by forestalling mosquito chomps using mosquito nets and creepy crawly anti-agents or with mosquito-control estimates like showering bug sprays and depleting standing water (Caraballo, 2014).

2. MATERIALS AND METHODS

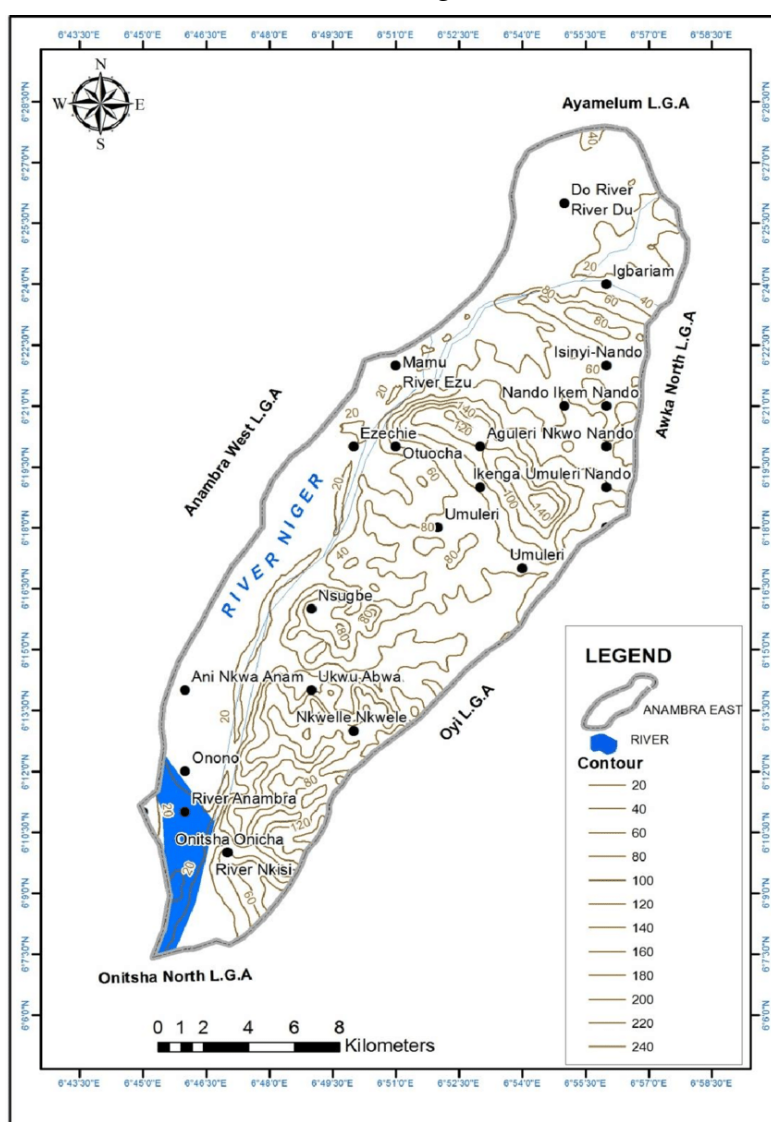
2.1. Research Design:

The study employed descriptive cross sectional survey design of 220 randomly recruited participants (103 males and 117 females) from age 18 years and above.

2.2. Area of the Study:

This study was carried out in Anambra East local government area (LGA) in Anambra state. The state is situated between latitudes 5o32' and 6o45' and longitude 6o43' and 7o22'E (Ejikeme et. al, 2017). Anambra East is situated very close to water bodies. Anambra East LGA is made up of depositional lowlands with pockets of lakes, ponds and water banks. The study communities lie within the humid tropical rainforest belt of south eastern Nigeria. The main occupation of the people is fishing, subsistence farming and trading. The nature of their occupation predisposes them to frequent mosquito bites.

Towns that make up Anambra East LGA are Aguleri, Enugwu Aguleri, Eziagulu Otu Aguleri, Enugwu Otu Aguleri, Mkpunando-otu Aguleri, Ikem Ivite Nando, Igbariam, Umuoba Anam, Nando, Umueri, Nsugbe.



Map: Contour Map of Anambra East. Source: Anambra State Ministry of Land and Survey

2.3. Population for the Study:

The population of the study was seventy-four thousand nine hundred and eighty eight thousand(74,988) adult population from 18-65 years in Anambra East Local Government Area of Anambra State.

2.4. Sample Sampling Technique:

The sample size for the study consisted two hundred and twenty (220) participants in Anambra East LGA. The Taro Yamane method for sample size was used to determine the sample size for the study. Below is the mathematical illustration for the Taro Yamane:

$$n = \frac{N}{1+N(e)^2}$$

Where n signifies the sample size, N signifies the population under study

E signifies the margin error (it could be 0.10, 0.05 or 0.01)

2.5. Sample Collection and Examination

One Litre of Blood was collected from the participant to obtain a baseline picture of malaria in the area. Blood sample was dropped on the RDT test kits for *P. falciparum*. Another Blood samples were dropped on the outer end of the slide for thin film and thick film on the inner part of the slide. The thin film was fixed in a 70% methanol. All blood films were stained using 3% Giemsa stain for thirty minutes. The slides were sent to the laboratory to be viewed microscopically for Plasmodium detection, speciation and parasite count. Malaria parasitemia was calculated and was reported according to WHO (2015) with little modification in grading as; low (50-500Parasites/ μ L), medium (>500-2000Parasites/ μ L) and high (>2000Parasites/ μ L). Thick blood films were used to establish and estimate the level of parasitaemia by counting the number of parasites against white blood cells/of blood while Thin films were used to determine plasmodium species encountered.

2.6. Method of Data Analysis:

Data was collected was coded in Microsoft Excels spread sheet software and was inputted into statistical package for social sciences (SPSS-IBM) version 23. Statistical outcomes were summarized by simple percentages as well as descriptive statistics (frequency tables) were generated.

3. RESULTS

3.1. Study Participants

In the study, 220 participants were tested for the presence of malaria parasitemia. Out of the number sampled, 60(27.3%) were from Nando community, 55(25.0%) were from Umuoba-Anam, 50(22.7%) and 55(25.0%) were from Nsugbe and Umueri respectively.

Table 1: Study communities and number of Participants

Community	Number of Participants	Percentage %
Nando	60	27.3
Umuoba-Anam	55	25.0
Nsugbe	50	22.7
Umueri	55	25.0
Total	220	100

3.2. Overall Malaria parasitemia

Malaria parasitemia for positive cases in this study area (Table 2) showed that 24(49.0%) of the cases, out of 49 positive cases had low malaria parasitemia with 50 parasites to 500parasites/ μ L of blood. There was high malaria parasitemia (>2000P/ μ L) with 6 (12.2%) positive cases while 19 (38.8%) had medium malaria parasitaemia (500-2000P/ μ L).

Table 2: Overall Malaria Parasitemia in Anambra East

Malaria Parasitemia Class	Number of Positive	Percentage %
Low (50-500P/μL)	24	49.0
Medium (>500-2000P/μL)	19	38.8
High (>2000P/μL)	6	12.2
Total positive	49	100

3.3. Malaria parasitemia results

From table 3, malaria parasitemia was found to be highest in Nando, followed by Umuoba-Anam and Nsugbe with Umueri having the least. The high level of malaria parasitemia was slightly higher in Nando with Nsugbe and Umueri having the least, while the medium malaria parasitemia of the disease was found to be higher in Nando (38.5%) and Umueri.

Table 3: Malaria Parasitemia in the different communities

Anambra East LGA		
Nando		
Low (50-500P/μL)	6	46.2%
Medium (>500-2000P/μL)	5	38.5%
High (>2000P/μL)	4	15.4%
Total positive	15	100%
Umuoba-Anam		
Low (50-500P/μL)	6	50.0%
Medium (>500-2000P/μL)	4	33.3%
High (>2000P/μL)	3	16.7%
Total positive	13	100%
Nsugbe		
Low (50-500P/μL)	4	44.4%
Medium (>500-2000P/μL)	3	33.33%
High (>2000P/μL)	2	22.2%
Total positive	9	100%
Umueri		
Low (50-500P/μL)	2	25.0%
Medium (>500-2000P/μL)	4	50.0%
High (>2000P/μL)	2	25.0%
Total positive	8	100%

4. DISCUSSION

Malaria is endemic throughout most of the tropical countries with an ongoing transmission in 95% countries and territories (WHO, 2015). This study in four communities in Anambra East local government

areas of Anambra state has confirmed an ongoing malaria transmission in the area.

Malaria parasitemia recorded in this study were mostly below 2,000 parasites/ μ L of blood with many cases falling below 500 parasites/ μ L. According to WHO (2013), asymptomatic parasitaemia may occur in high transmission areas after childhood, when anti-malaria semi-immunity occurs. In recent years, the use of more sensitive diagnostic techniques has demonstrated a significant number of malaria infections at densities beneath the limit of detection of conventional microscopy and rapid diagnostic tests (RDT). Lowest malaria parasitemia was recorded in Umueri.

According to the Nigeria Malaria Fact Sheet (US Embassy in Nigeria, 2016), malaria accounts for 60% of outpatient visits, 30% of hospitalizations among children under five years of age in Nigeria and contributes to an estimated 11% of maternal mortality. All the mosquitoes encountered in this study are potential vectors of different mosquito-borne diseases. Apart from constituting a serious nuisance to humans, mosquitoes also transmit diseases such as Japanese and Saint Louis encephalitis, Rift valley fever, West Nile Virus and lymphatic filariasis (Goddard et al., 2002). Apart from malaria, Anopheles mosquitoes are also known to transmit *Wuchereria bancrofti* (filarial worm); the Timorese filarial, *Brugia timori* and several arboviruses.

5. Conclusion

The findings of this study have shown that there is ongoing transmission of malaria in the area. Mosquito proofing houses should become the central plank of malaria control activities in the tropical countries. Apart from the fact that mosquitoes are possibly becoming resistant to the insecticides used in treating bed nets, the effectiveness of insecticide treated bed net is also limited by the fact that it is primarily designed to protect individuals who are sleeping from mosquito bite. Most mosquito bites take place within the house from dusk, when people are still busy with activities such as cooking, eating, reading, relaxing, etc. as such any measure taken to keep mosquitoes from entering the house therefore, should be given more attention.

Based on the findings, the following recommendations were drawn:

1) Mosquito-proofing houses should become the central plank of malaria control activities in the tropical countries: Apart from the fact that mosquitoes are becoming resistant to the insecticides used in treating bed nets, the effectiveness of insecticide treated bed net is also limited by the fact

that it is primarily designed to protect individuals who are sleeping from mosquito bite. Most mosquito bites take place within the house from dusk, when people are still busy with activities such as cooking, eating, reading, relaxing, etc. Sometimes in the course of relaxation, one can even sleep off in sitting rooms without going under bed net. Any measure taken to keep mosquitoes from entering the house therefore, should be given more attention.

2) Rational integrated approach of control methods should be seriously considered: The current approach in Nigeria for example, where the use of insecticide treated bed net is being widely promoted, while all other control measures are being sidelined is wrong. Policy makers should sit and determine which method(s) will be most effective in any given environment. For example, in villages where many people do not have suitable bed where ITBN can be fixed (they sleep with tiny mattresses or mat laid on the floor), consideration should be given more to control methods that prevent mosquitoes from gaining access into homes and those that target mosquito breeding sites instead of insisting on the use of insecticide treated bed net.

3) Architects and other builders should be educated to have disease prevention uppermost in their minds during house designing and construction: Some of the houses encountered in the study area, especially the mud houses have doors and windows that are not suitable for screens (Appendix B). This is simply because the builders did not have such a thing in mind during the construction of the houses.

4) There should be intensified effort to continuously educate the masses on all the strategies of malaria prevention and encourage environmental sanitation: It was observed in this study that people live in houses surrounded by stagnant water (appendix B) and nothing is done to stop mosquitoes from breeding inside the water.

5) Repairing of dilapidated building: A situation whereby the house or any part of the building gets dilapidated, the right experts should be invited to correct/repair it.

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