



Prevalence and Trend of Malaria Among Pregnant Mothers in Nsukka Lga of Enugu State Nigeria: Implication for Physical Fitness

KEYWORDS

Prevalence, Trend, Malaria, Pregnant, Mothers

C.C. IGBOKWE

D.A. ANIDO

A.N. ODO

UNIVERSITY OF NIGERIA NSUKKA

UNIVERSITY OF NIGERIA NSUKKA

UNIVERSITY OF NIGERIA NSUKKA

ABSTRACT

The purpose of the study was to determine the prevalence rate of malaria among pregnant mothers in Nsukka Local Government Area of Enugu State (2008-2012). Three research questions and one hypothesis guided the study. The descriptive survey of ex-post-facto design was adopted for the study. The population consisted of all pregnant mothers that attended health facilities in Nsukka LGA. The antenatal case folders were used. A total number of 11,094 malaria cases were found out and used for the study. The instrument for data collection was researchers designed inventory proforma. Data generated were analyzed using frequency and percentages. The Chi-square statistic was used to test the null hypothesis. The result showed that the highest prevalence rate of malaria in pregnancy was recorded in 2008 (210.1 per 1000) while the lowest prevalence rate was recorded in 2012 (147.0 per 1000); age was a factor in the prevalence of malaria among pregnant mothers; and there was a fluctuating prevalence trend of malaria among pregnant mothers for the five years. Based on these findings, the researchers recommended among others that, increased awareness campaign and intervention strategies by the roll-back malaria programme should be maintained to ensure continuous reduction of malaria among pregnant mothers.

Introduction

Malaria is generally a major health problem in most countries worldwide. Breman (2003) stated that more than 240 million people worldwide develop symptomatic malaria annually. Malaria poses a big health challenge in Africa. About 45 countries in Africa including Nigeria are endemic for malaria (Agomo, Oyibo, Anorlu & Agomo, 2009). In Nigeria, malaria ranks highest among the notifiable diseases (Obionu, 2006). It affects all age groups but more severe in children and pregnant mothers. This however could be due to their reduced immunity to fight the parasite.

Malaria is an infectious disease caused by a single-celled protozoan parasite of plasmodium specie (spp). The four plasmodium spp that infect human are plasmodium falciparum, plasmodium malaria, plasmodium ovale and plasmodium vivax (Kalu, Obasi, Nuka & Otu Christian, 2012). The most common plasmodium in tropical Africa is plasmodium falciparum. Malaria in pregnancy has been associated with maternal morbidity and mortality. Lucas & Gills (2007) stated that malaria is responsible for about 11 per cent of maternal deaths in Nigeria.

Malaria is transmitted from one host to another by the female anopheles mosquitoes which become infected when they feed on human, carrying both the male and female gametocytes after which the sexual cycle begins (Myles, 2009). The author further stated that the development and multiplication of the parasite in the mosquito take 7 – 20 days and the insect becomes infected at the end of this period with the appearance of sporozoites in the salivary gland. The sporozoites are injected into the human blood during a mosquito bite; sexual cycle of the development thus begins. It is during this process that the sporozoites quickly disappear from the blood into the liver where they mature and multiply into merozoites which eventually leave the liver to invade red blood cells. This red blood cell cycle lasts for 48 hours at the end of which more merozoites are released into blood stream causing signs and symptoms.

The incubation period of malaria is 10-14 days with an av-

erage of seven days. Signs and symptoms of malaria include general malaise, lack of appetite, headache, joint and body aches, followed by irregular fever which is often interrupted by episodes of rigor (shivering) and then sweating. These symptoms are severe in pregnancy and if not early detected and adequately treated might result to complication like cerebral malaria which leads, among others. Malaria in pregnancy is life threatening and the group of women mostly affected by malaria are women in their first and or second pregnancies, HIV infected women, women with sickle cell diseases and all pregnant women with sickle cell diseases and all pregnant women with anemia (Adesokan, 2010). The control of this disease is still a big challenge to public health especially among pregnant mothers.

Malaria in pregnancy could be controlled through curative and preventive approaches. Obionu (2006) asserted that curative and preventive approaches to control of malaria in pregnancy are very essential. Early diagnosis and appropriate treatment of malaria among pregnant women should be given adequate attention as a way of controlling the disease and preventing its complications. Prophylactic treatment of malaria among pregnant women with sulphadoxine and pyrimethamine (SP) drugs such as fansidar, metakalfin, maldox etc has proved effective.

Preventive approaches to the control of malaria during pregnancy include environmental control aimed at elimination of breeding places such as draining areas of impounded water, clearing vegetation forestation and deforestation activities and application of insecticides (Obionu, 2006). Other preventive approaches are personal protection to reduce or prevent human contact with mosquitoes, community mobilization, health education and physical fitness.

Community mobilization and health education involves educating the community members on the mode of transmission of malaria and simple actions to take, to control mosquitoes and reduce mosquito-man contacts. Also, simple information about the signs and symptoms of malaria should be provided to the people so that they can seek

prompt medical attention.

Prevalence refers to all cases (old and new) existing in given population. Park (2009) stated that prevalence is the total number of all individuals who have an attribute or disease at a particular time divided by the population at risk of having the attribute or disease at that period of time. The author further stated that prevalence is of two types: point prevalence and period prevalence. Point prevalence is the number of cases present at a specific moment of time while period prevalence is the number of all cases that occur during a specific period of time. Period prevalence therefore, will be more appropriate measure for this present study as it aims to study the prevalence of malaria among pregnant women from 2008-2012 in Nsukka LGA of Enugu state. The study also sought to determine the trend of malaria among pregnant mothers during this period.

Trend is a general direction in which a situation is changing or developing. Malaria trend describes the pattern of occurrence of malaria infection. Index number was used to establish the trend of malaria among pregnant women for the period of five years. Physical fitness on the other hand plays a very significant role in the control and resistant of malaria infection.

The occurrence of malaria can be positively affected by the physical fitness status of the pregnant mother. Physical fitness as an essential element of life affects the health of the individuals. Howel and Frank (2013) defined it as a state of well being with low risk of premature health problems and energy to participate in a variety of physical activities. Physical fitness is relevant in the control and resistance of malaria infections. This is achieved through exercises, adequate nutrition and antenatal care services utilized by pregnant mothers before and during the course of pregnancy.

Research Questions

1. What is the prevalence rate of malaria among pregnant women in Nsukka LGA between 2008 and 2012?
2. What is the prevalence of malaria among pregnant women in Nsukka LGA between 2008 and 2012 based on age?
3. What is the prevalence trend of malaria among pregnant women in Nsukka LGA between 2008 and 2012?

Hypothesis

There is no significant difference in the prevalence of malaria among pregnant women in Nsukka LGA between 2008 and 2012 based on age.

Methods

The study adopted descriptive survey of ex-post-facto design using the retrospective survey. This method was chosen because it is mostly used in epidemiological studies and is also widely used to retrieve data from records on the occurrence of disease in the past (Nworgu, 2006). The population for the study consisted of all mothers that attended the health facilities in Nsukka LGA from 2008-2012. According to the Monitoring and Evaluation (M&E) unit of the Department of Health, Nsukka LGA, there are fifty health facilities in the LGA with total number of 12,371 pregnant women between 2008 and 2012. Pregnant women's ante-natal folders were used and 11, 094 malaria cases were found out. There was no further sampling because the present study is an epidemiological survey.

The researchers-designed inventory proforma otherwise called prevalence of malaria inventory proforma (PMIP) was used for data collection. It was used to collect data from these health facilities on the prevalence of malaria among pregnant mothers for the period of five years in Nsukka LGA. Data from this inventory provided information in respect to the prevalence of malaria among pregnant mothers using age as the only socio-demographic variable for the study. The face validity of the instrument was established through the judgment of three experts drawn from the Department of Health and Physical Education, University of Nigeria, Nsukka. The PMIP requires no test of reliability. The researchers employed the services of three research assistants (medical record officers) who helped in the transfer of data from the clients' folder to the proforma for the period of five years (2008-2012). Frequency and percentages of the yearly occurrence of malaria in pregnancy was used to determine the prevalence rate of malaria during pregnancy while index number was used to establish the trend of malaria among pregnant mothers. The base line determinant was 2008 occurrence of malaria among the pregnant mothers. The Chi-square statistic was used to test the null hypothesis at .05 level of significance.

Results

The results are hereby presented in tables and graphs as they relate to the research questions and hypothesis.

Table 1 Prevalence Rate of Malaria among Pregnant Mother (n = 11,094)

Year	F	%	PR
2008	2099	18.9	210.1
2009	2128	19.2	195.9
2010	2256	20.3	166.3
2011	2347	21.2	151.1
2012	2264	20.4	147.0

Note: PR = Prevalence rate

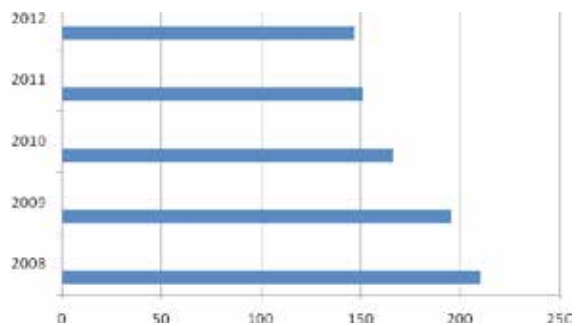


Figure 1: Bar Graph showing the Prevalence Rate of Malaria among Pregnant the Mothers

Table 1 that the prevalence rate of malaria among pregnant mothers from 2008-2012 was highest in 2008 (210.1) and lowest in 2012 (147.0). Figure 1 is a pictorial presentation of the prevalence rate of malaria among pregnant mothers in Nsukka LGA between 2008 and 2012. The figure shows also that the prevalence rate is highest in 2008 and lowest in 2012.

Table 2 Prevalence of Malaria among Pregnant Mothers Base on Age (n = 11, 094)

Year	18 – 30 years		31 – 40 years		41 and above	
	F	%	F	%	F	%

2008	42	3.3	29	2.3	64	5.0
2009	59	4.6	33	2.6	72	5.6
2010	94	7.4	72	5.6	127	9.9
2011	128	10.2	117	9.2	139	10.9
2012	101	7.9	83	6.5	177	9.2

Table 2 shows that the highest prevalence of malaria among pregnant mothers of 18–30 years was recorded in 2011 (7.0%) and lowest in 2008 (6.3%) while pregnant mothers of 31–40 years recorded highest prevalence in 2012 (6.5%) and lowest in 2009 (5.3%). The table further shows that the highest prevalence of malaria among pregnant women of 40 years and above was recorded in 2011 (7.7%) and the lowest prevalence recorded in 2011 (7.1%). These reveal that the prevalence of malaria for the five years (2008 - 2012) was recorded among pregnant women between the ages of 41 and above (7.7%) in 2011 while the lowest (5.3%) was recorded among pregnant women between 31 – 40 years in 2009.

Table 3 Prevalence Trend of Malaria among Pregnant Mothers

Year	F	Index Number
2008	2099	100
2009	2129	101
2010	2256	107
2011	2347	112
2012	2264	108

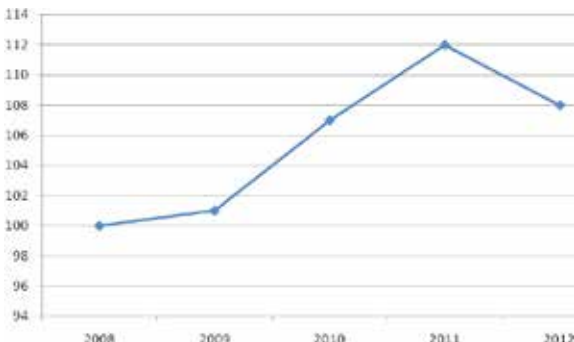


Figure 1: A Line Chart Showing the Prevalence Trend of Malaria among Pregnant Women

Table 3 and figure 2 show that there is a steady increase from 2009 to 2011 when it reached the peak at 112. By 2012, the prevalence trend decreased to 108. This indicates that there was a slight fluctuation in the prevalence trend of malaria among pregnant mothers in Nsukka LGA of Enugu State between 2008 and 2012.

Table 4 Summary of Chi-square Analysis of Prevalence of Malaria Based on Age

Variable	N	Cal χ^2	Tab χ^2	df	P	Decision
Age	11,094	15.7	15.5	8	.05	Rejected

Table 4 reveals that the calculated Chi-square value of 15.7 is greater than the table Chi-square value of 15.5 at .05 level of significance and different of 8. The null hypothesis of no significance difference in the prevalence of malaria among pregnant mothers in Nsukka LGA based on age was therefore accepted

Discussion

The findings in table 1 revealed that there were 11094 cases of malaria among pregnant women for the five years (2008-2012) in Nsukka LGA of Enugu State. The highest prevalence rate of malaria in pregnancy was recorded in 2008 (210.1 per 1000) while the lowest prevalence rate was recorded in 2012 (147.0 per 1000). These findings were not surprising rather expected because of the increased awareness campaign and intervention programmes embarked upon by roll-back malaria (RBM) programme in Nsukka. Aluko and Oluwatosin (2012) stated that pregnant women are part of the key target group of RBM. They further maintained that the four key intervention strategies of RBM as recommended by the World Health Organization (WHO) are: case management of malaria in pregnancy using sulphadoxine + pyrimethamine (SP) as a drug of choice for intermittent preventive treatment (IPT), wide spread use of insecticide treated nets (ITNs), and antenatal care (ANC) services. The findings were also in line with the assertion of Chukwu (2012), who asserted that malaria related deaths had been cut short by 1/3 as there was increase in the number of pregnant women who received two or more doses of IPT from 9.0 to 16.6 per cent.

The findings in table 2 indicated that age was a factor in the prevalence of malaria among pregnant mothers in the area of study. The findings revealed that pregnant mother within the age range of 41 years and above had the highest prevalence rate (7.7%) recorded in 2008 and the lowest rate (5.3%) recorded in 2009, among pregnant mothers within the age range of 31-40 years. These findings were expected because some disease conditions increase with age. Snow (1998) asserted that there was astronomical increase of malaria infection for pregnant mothers who were 40 years and above. This may be due to low utilization of ITNs observed in older pregnant women, resulting from discomfort experienced by some by them when they sleep under the ITN. Aluko and Abimola (2012) also found that there was low utilization of ITN among postpartum women in Ibadan due to discomfort especially excessive heat when slept under ITN.

The Chi-square analysis of no significant difference in the prevalence of malaria among pregnant mothers based on age was rejected. This implies that age is a factor in the prevalence of malaria among pregnant mothers in Nsukka LGA of Enugu State. This finding supports the finding in Table 2 which showed that pregnant mothers within the age range of 41 years and above had the highest prevalence of malaria in pregnancy indication that age is a very story variable prevalence of malaria among pregnant mothers.

The findings in table 3 revealed fluctuating prevalence trend of malaria among pregnant mothers for the five years (2008 - 2012) in Nsukka LGA. The prevalence trend recorded a maximum index number of 112 in 2012 and minimum number of 100 in 2008. This finding was expected because of the influence of intervention programmes on malaria control. Alemu et al (2012) opined that factors affecting malaria incidence and prevalence trends include increase attention to malaria control and preventive measures by different agencies.

Implication of the Study for Physical Fitness

Physical fitness is a general need of every human organism especially pregnant women. This is however very important due to the nature of physical fitness associated with individual lifestyle and nature of the activities pregnant women

engage in during the period of gestation. Aniodo (2011) stated that physical fitness is the acquisition and demonstration of strength, agility, power, balance, flexibility and control. He further asserted that physical fitness is the ability to perform some evaluated task for either social or economic purposes. A pregnant woman, who is physically fit, should therefore be able to accept and effectively execute a task without undue stress.

Health related fitness include stabilized body temperature, heart rate and blood pressure, while health skill related fitness are muscle strength, muscle endurance, flexibility, cardio-respiratory endurance and body composition. It had been established through literature assertions that the exercises and physical activities pregnant women engage in on a daily basis especially during antenatal care services have some physiological effect on several organs of the body. Physical fitness and adequate nutrition therefore, enhance the functioning of all the systems of the body with resultant resistant to malaria infection. Pregnant mothers should not engage in strenuous physical activities as these may endanger the life of the fetus. Hence, gentle physical activities such as being practiced during antenatal care services should be encouraged by both health and physical educators, and other health professionals to promote body system functioning and fetal development.

Conclusions

The following conclusions were made based on the findings and discussion:

1. The highest prevalence rate of malaria in pregnancy was recorded in 2008 (210.1 per 1000), while the lowest rate was recorded in 2012 (147.0 per 1000).
2. The prevalence of malaria among the pregnant mothers differed based on age.
3. There was fluctuating prevalence trend of malaria among the pregnant mothers for the five years (2008-2012).

Recommendations

Based on the findings and conclusions, the following recommendations were made:

1. The increased awareness campaign and intervention programmes by the roll-back malaria programme should be maintained to ensure continuous reduction of malaria among pregnant mothers.
2. Mothers should be encouraged to start antenatal visits early, irrespective of their ages and parity for early detection and treatment of malaria in pregnancy.
3. Environmental hygiene practices should be advocated to reduce the breeding and spread of mosquitoes.
4. Free insecticide treated mosquito nets should be given to mothers during antenatal visits and should be encouraged to sleep on it always to avoid mosquito bites.

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