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PREDICTORS OF MALARIA AMONG PREGNANT WOMEN ATTENDING ANTE-NATAL CLINIC IN GENERAL HOSPITAL IN ZAMFARA STATE, NIGERIA

KALLAMU HADIZA

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By

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November 2015

Chair : Assoc. Prof. Hejar Binti Abd Rahman, PhD
Faculty : Medicine and Health Sciences

Introduction: Malaria is a major health problem with global concern. It is one of the worldôs most prevalent serious infectious diseases, with approximately 250 million cases and one million deaths per year. Nigeria is included among the 45 countries that are endemic for malaria, and about 97% of the population were at risk especially children and pregnant women.

Objectives: To determine the predictors of malaria among pregnant women attending ante-natal clinic in general hospitals Zamfara State, Nigeria.

Methodology: A case control study was conducted among pregnant women attending ante-natal clinic in general hospital Zamfara State, Nigeria. A total of 522 pregnant women 261 cases and 261 controls were selected using multistage random sampling. Cases and controls in this study were defined as a pregnant woman attending ante-natal clinic from the selected general hospitals in Zamfara, confirmed with and without malaria respectively, using giemsa staining method based on their medical records. Face to face interview and self-administered pretested questionnaire in English and Hausa languages was used to obtain information based on their socio demographic characteristics, maternal history, knowledge, attitude and preventive practices regarding malaria from May to August 2014. The data was analysed using SPSS version 21, chi square test was used to determine the association between the groupôs case and controls, and logistic regression was used to determine the predictors of malaria. Significant level (p) was set at 0.05.

Results: The overall response rate was 89.8%. Chi square results shows that pregnant women Ò 25 years of age were more significantly associated with malaria than those with older age (χ^2 = 17.835, df = 3, p < 0.001), informal education (χ^2 = 166.619, df = 4, p < 0.001), unemployment (χ^2 = 220.519, df = 2, p < 0.001), monthly income < 5000 naira (χ^2 = 353.841, df = 2, p < 0.001), first trimester (χ^2 = 27.754, df = 2, p < 0.001). Other essential significant variables include low level of knowledge on malaria (χ^2 = 96.632, df = 1, p < 0.001), negative attitude (χ^2 = 248.309, df = 1, p < 0.001) and low level of preventive practices (χ^2 = 148.761, df = 1, p < 0.001) are

significantly associated with malaria. Predictors of malaria include informal education (AOR = 8.340, 95% CI = 3.170, 21.947), unemployment (AOR = 8.437, 95% CI = 1.695, 42.007), monthly income < 1000 naira (AOR = 18.809, 95% CI = 3.829, 92.393), low knowledge (AOR = 5.363, 95% CI = 2.130, 13.501), negative attitude (AOR = 33.831, 95% CI = 12.749, 89.778) and no practice (AOR = 44.622, 95% CI = 3.829, 92.392).

Conclusion: This study has identified informal education, unemployment, low monthly income, low level of knowledge, negative attitude and poor preventive practices as predictors of malaria among pregnant women attending ante-natal clinic in general hospitals in Zamfara State, Nigeria. The findings in this study can be used by policy makers to plan how to tackle the risk factors of malaria among pregnant women in the State.

Keywords: Malaria, predictors, pregnancy, Zamfara State, Nigeria

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Sarjana Sains

PERAMAL MALARIA DALAM KALANGAN WANITA HAMIL YANG MENGHADIRI KLINIK ANTENATAL DI HOSPITAL BESAR DI ZAMFARA NEGERI, NIGERIA 2014

Oleh

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Pengerusi : Prof. Madya Hejar Binti Abd Rahman, PhD
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Pengenalan: Malaria merupakan masalah kesihatan utama dengan kebimbangan global. Ia merupakan salah satu penyakit berjangkit yang serius paling lazim di dunia, dengan kira-kira 250 juta kes dan satu juta kematian setiap tahun. Nigeria adalah termasuk di kalangan 45 negara yang endemik malaria, dan kira-kira 97% daripada populasi berisiko terutamanya kanak-kanak dan wanita hamil.

Objektif: Untuk menentukan peramal malaria dalam kalangan wanita hamil yang menghadiri klinik antenatal di Hospital besar Zamfara Negeri, Nigeria.
Metodologi: Satu kajian kes-kes kawalan telah dijalankan dalam kalangan wanita hamil yang menghadiri klinik antenatal di Hospital besar Zamfara Negeri, Nigeria. Seramai 522 wanita hamil 261 kes dan 261 kawalan telah dipilih menggunakan pensampelan rawak pelbagai peringkat. Kes dan kawalan dalam kajian ini ditakrifkan sebagai seorang wanita hamil yang menghadiri klinik antenatal dari hospital besar terpilih di Zamfara, disahkan dengan dan atampa malaria masing-masing menggunakan kaedah pewarnaan giemsa berdasarkan rekod perubatan mereka. Temuduga bersemuka dan soal selidik praujian tadbir sendiri dalam Bahasa Inggeris dan Bahasa Hausa telah digunakan untuk mendapatkan maklumat berdasarkan kepada ciri-ciri sosio demografi mereka, sejarah keibuan, pengetahuan, sikap dan amalan pencegahan mengenai malaria dari Mei hingga Ogos 2014. Data dianalisis dengan menggunakan SPSS versi 21, ujian khi kuasa dua telah digunakan untuk menentukan hubungan antara kumpulan kes dan kawalan, dan regresi logistik telah digunakan untuk menentukan peramal malaria. Aras signifikan (p) telah ditetapkan pada 0.05

Hasil: Kadar sambutan keseluruhan adalah 89.8%. Keputusan khi kuasa dua menunjukkan bahawa wanita hamil Ò 25 tahun mempunyai hubungan lebih signifikan dengan malaria berbanding mereka yang lebih berusia (…˙ = 17.835, df = 3, p < 0.001), pendidikan tidak formal (…˙ = 166.619, df = 4, p < 0.001), pengangguran (…˙ = 220.519, df = 2, p < 0.001), pendapatan bulanan < 5000 naira (…˙ = 353.841, df = 2, p < 0.001), trimester pertama (…˙ = 27.754, df = 2, p < 0.001). Pembolehubah signifikan penting yang lain termasuk tahap pengetahuan yang rendah mengenai malaria (…˙ = 96.632, df = 1, p < 0.001), sikap negatif (…˙ = 248.309, df = 1, p < 0.001) dan tahap

amalan pencegahan yang rendah (… ˙ = 148.761, df = 1, p < 0.001) adalah berhubung secara signifikan dengan malaria. Peramal malaria termasuk pendidikan tidak formal (AOR = 8.340, 95% CI = 3.170, 21.947), pengangguran (AOR = 8.437, 95% CI = 1.695, 42.007), pendapatan bulanan <1000 naira (AOR = 18.809, 95% CI = 3.829, 92.393), pengetahuan rendah (AOR = 5.363, 95% CI = 2.130, 13.501), sikap negatif (AOR = 33.831, 95% CI = 12.749, 89.778) dan amalan miskin (AOR = 44.622, 95% CI = 3.829, 92.392).

Kesimpulan: Kajian ini telah mengenal pasti pendidikan tidak formal, pengangguran, pendapatan bulanan yang rendah, tahap rendah pengetahuan, sikap negative dan amalan pencegahan miskin sebagai peramal malaria dalam kalangan wanita hamil yang menghadiri klinik antenatal di Hospital besar di Zamfara Negeri, Nigeria. Penemuan dalam kajian ini boleh digunakan oleh pembuat dasar dalam merancang bagaimana untuk menangani faktor-faktor risiko malaria dalam kalangan wanita hamil di negeri ini.

Kata kunci: Malaria, peramal, kehamilan, Zamfara Negeri, Nigeria

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

<	Less than
>	Greater than
Ò	Less than or equal to
Ó	Greater than or equal to
AOR	Adjusted odds ratio
CI	Confidence interval
COR	Crude odds ratio
DF	Degree of freedom
F	Frequency
FMOH	Federal Ministry of Health
IPT	Intermittent Preventive Treatment
IRS	Insecticide Residual Spray
ITNs	Insecticide Treated Nets
LLINs	Long Lasting Insecticide Nets
MDGs	Millennium Development Goals
N	Total number
NDHS	National Demographic and Health Survey
NMCP	National Malaria Control Programme
NMCSP	National Malaria Control Strategic Plan
NPC	National Population Commission
OR	Odds ratio
RBM	Roll Back Malaria
SP	Sulfadoxine pyrimethamine/Fansidar
WHO	World Health Organisation

CHAPTER 1

INTRODUCTION

1.1 Background

Malaria is the worldôs most prevalent serious infectious disease with major health problems, and has attracted global concern. There were approximately 198 million cases and 584,000 deaths in 2013 (WHO, 2014), and it was estimated that more than 80% of the cases were in Sub-Saharan Africa. Approximately one death occurs every 30 seconds with 90% of the mortality rate occurring in Sub-Saharan Africa, and 90% of malaria deaths are of children less than five years of age and pregnant women (Tillotson, 2012).

Control of malaria still remains a challenge in Africa, as evidenced by the 163 million estimated cases and 528,000 deaths in 2013. Nigeria and the Democratic Republic of the Congo together accounted for 39% and 34% of the global total of estimated malaria deaths and cases respectively in 2013 (WHO, 2014). Nigeria, which is included among the 45 countries that are endemic for malaria, has a population of over 170 million, and 97% of the population are at risk particularly pregnant women and children. The statistics indicate that Nigeria alone accounts for 45% of the prevalence in the African continent (Agomo, Oyibo, Anorlu, & Agomo, 2009; Aregawi, Cibulskis, Otten, & Williams, 2009; Duffy & Fried, 2005). Malaria in pregnancy is a serious health problem both in pregnant women and her foetus with 11% maternal deaths annually in Nigeria (Nzeako, Nduka, & Origie, 2013; World Health Organization, 2012).

The Nigerian climate makes malaria transmission suitable throughout the country, due to geographic location of the country; only 3% of the populace who live at an altitude ranging from 1,200 to 1,400 metres in the Southern Jos, Plateau State are at relatively low risk of malaria. Similarly, it has been estimated that about 140 million people are living in areas of high malaria transmission due to large population of Nigeria (Polsa, Spens, Soneye, & Antai, 2011). About 30 million women in malaria-endemic areas of Africa become pregnant each year, and are at risk of infection with *Plasmodium falciparum*. The prevalence of malaria infection in the north-western part of Nigeria, Sokoto State is 27.29%, as malaria is endemic in Nigeria with seasonal variation in different geographic regions of the country; it has been described as moderately high (Abdullahi et al., 2009; Steketee, Nahlen, Parise, & Menendez, 2001).

Pregnancy complications have been associated with increased incidence and severity of malaria. In Sub-Saharan Africa, the effects of the disease are anaemia, spontaneous abortion, prematurity and stillbirths are effects of the disease (Okpere, Enabudoso, & Osemwenkha, 2010). The increased susceptibility of pregnant women to malaria is as a result of decreased immunity caused by pregnancy which makes them more vulnerable to anaemia, still birth, placental parasitisation and increasing the risk of illness leading to death. Maternal malaria also affects the unborn babies by increasing the risk of spontaneous abortion, stillbirth, premature delivery and low birth weight, and is a leading cause of child mortality (World Health Organization, 2010).

Malaria is usually linked with poverty and may also be a major burden to economic development (Aregawi et al., 2009). The prevalence of the disease is higher in Sub-Saharan Africa than in many other regions of the world, more than 75% of the cases in this region are due to *P. falciparum*, while in most other countries the disease transmission is as a result of the other less virulent plasmodial species. It has however been reported that the majority of the mortality recorded as a result of malaria is caused by *P. falciparum* (Aregawi et al., 2009).

The increased risk of malarial infection could be related to illiteracy, low educational status, unemployment, low income and gravidity of the pregnant women. The other risk factors are environment, such as the presence of unclean gutters, residence in swamps that are favourable conditions for the breeding of Anopheles mosquitoes, poor knowledge, attitude and preventive practices towards the prevention and control measures of malaria (Amuta, Houmsou, Wama, & Ameh, 2014; Bawa, Auta, & Liadi, 2014; Oyefabi, Sambo, & Sabitu, 2015).

1.2 Problem statements

Malaria still remains an important public health concern globally; about 3.3 billion people were at risk of malaria infection in 2013. It has been indicated by the World Malaria Reports that Africa bears the heaviest burden and the highest risk of malaria infection. Africa accounted for about 82% and 90% of the reported malaria cases and deaths respectively, with pregnant women and children below five years suffering the most (WHO, 2014).

High prevalence rates of malaria among pregnant women have been reported by many studies in different parts of Nigeria, (namely Kogi, Katsina, Kano, Benue, Osun and Rivers States) ranging from 30.0% to 72.5% (Adefioye, Adeyeba, Hassan, & Oyeniran, 2007; Amuta, Houmsou, Wama, & Ameh, 2014; Bawa, Auta, & Liadi, 2014; Gajida, Iliyasu, & Zoakah, 2010; Mofolorunsho, Audu, & Omatola, 2014; Nzeako, Nduka, & Origie, 2013). More than 90% of the Nigerian population were at risk of malaria and at least 50% of the total population experience an incidence of malaria yearly. The disease also affects the general population, beyond the effects on pregnant women and children (Federal Ministry of Health, 2004; Roll Back Malaria, 2013).

Each year up to 10,000 maternal deaths were recorded as a result of maternal malaria and it contributes to high maternal morbidity rates; that is, severe anaemia, fever, and placental parasitaemia especially in first time mothers (Falade, Tongo, Ogunkunle, & Orimadegun, 2010; Savage, Msyamboza, Gies, DôAlessandro, & Brabin, 2007). It has also been attributed to between 75,000 to 200,000 infant deaths annually (Steketee et al., 2001).

1.3 Significance of the Study

The significance of the study is to identify the predictors of malaria among pregnant women, and highlight areas for possible management modification and further research based on the findings of current predictors of malaria among pregnant women in Zamfara State. Identifying the predictors and implementing prevention of malaria during pregnancy is one of the major interventions in helping to reduce maternal and infant mortality and morbidity.

Since no research has been reported so far on the predictors of malaria among pregnant women in Zamfara State, this study will provide more information. Hence, information that will be gathered from the study will be used by the Ministry of Health, Zamfara State, to improve programmes dealing with prevention services against malaria in the State.

1.4 Objectives

1.4.1 General Objectives

The general objective is to determine the predictors of malaria among pregnant women attending ante-natal clinic in general hospitals Zamfara State.

1.4.2 Specific Objectives

i. To determine the socio-demographic factors (such as age, ethnicity, religion, marital status, educational status, occupation and monthly income) of pregnant women among cases and controls.
ii. To determine the maternal history (such as gravidity and trimester) of pregnant women among cases and controls.
iii. To determine the level of knowledge (such as causes, signs and symptoms, breeding sites, people at risk, mode of transmission, prevention and control, effects, seasonal variation and diagnosis), attitude (such as mode of transmission, treatment, prevention and control) and preventive practices (using LLIN, repellent spray, long sleeves, mosquito coil and good hygiene) on malaria in pregnant women among cases and controls.
iv. To determine the association between socio-demographic factors, maternal history, knowledge, attitude and practices of pregnant women and malaria.
v. To determine the predictors of malaria in pregnant women among cases and controls.

1.5 Research Hypotheses

i. There is a significant association between the socio-demographic factors of cases as compared to controls with regards to malaria in pregnancy.
ii. There is a significant association between the maternal histories of cases compared to controls with regards to malaria in pregnancy.
iii. There is a significant association between the levels of knowledge of cases compared to controls with regards to malaria in pregnancy.
iv. There is a significant association between the levels of attitude of cases compared to controls with regards to malaria in pregnancy.
v. There is a significant association between the levels of practice of cases compared to controls with regards to malaria in pregnancy.
vi. Socio-demogrphic factors, maternal history, level of knowledge, attitude and practice are risk factors of malaria among pregnant women.
vii. Socio-demogrphic factors, maternal history, level of knowledge, attitude and practice are predictors of malaria among pregnant women.

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