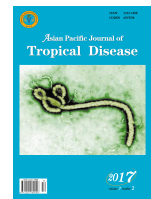


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## Home management practices and its impact on malaria prevalence amongst pregnant women in South-Eastern Nigeria

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### ABSTRACT

**Objective:** To assess and compare the impact of home management of malaria prevalence amongst pregnant women in Aba South Local Government Area of Abia State, Eastern Nigeria. **Methods:** Blood samples from 432 pregnant women who attended Primary Health Care Centre and Abia State University Teaching Hospital were examined using Giemsa-stained thick and thin films. Structured questionnaires were also administered to the women from whom blood samples were collected.

**Results:** Most of the respondents 192 (44.4%) were found to use insecticide-treated nets (ITNs) with a malaria prevalence of 27.1%. Other home management strategies used were burning of local plants 3 (0.7%) with a malaria prevalence of 33.3%. Those who did not own ITNs had a malaria prevalence of 86.7%.

**Conclusions:** The need to intensify effort on educating pregnant women on the proper use of home management strategies especially the use of ITNs and local plants that have anti mosquito activity is encouraged.

## 1. Introduction

Malaria is one of the most important causes of morbidity in the world. It is a vector-borne infectious disease caused by a protozoan parasite, *Plasmodium*, transmitted from person to person, mainly through the bite of an infected female mosquito which requires human blood to nurture her eggs. The female anopheles mosquito is the vector for human malaria, and mainly bites human between 5 p.m. and 7 a.m. In about 97 nations and territories in the tropics and subtropics, malaria is known to be a major health challenge where an approximately 214 million cases occur annually and 3.2 billion people are at risk of infection[1]. An estimated 438000 deaths were ascribed to malaria in 2015, especially in sub-Saharan Africa, where

90% of all malaria deaths occur[1]. A nation that suffers the world's greatest malaria burden, with approximately 51 million cases and 207000 deaths reported annually, while 97% of the total population is at risk of infection is Nigeria[2]. In addition to its ongoing health effect in Nigeria, malaria is known to be responsible for about 60% of outpatient attendance to hospitals, culminating at 11% of maternal mortality and 30% of child mortality, mostly in children between 0 and 5 years[2,3]. Pregnant women and children under five years are particularly prone to have malaria due to their weaker immune systems[4]. Malaria does not only affect the health of the pregnant women, but also increase the cost of treatment coupled with high mortality associated with the disease, which makes malaria a major retarding factor to development in the country[5]. Studies on treatment seeking behavior have shown that most malaria episodes are first treated at home because of inaccessibility to basic health care facilities in most communities especially rural areas. So people used local remedies within their reach[6]. Early recognition and appropriate treatment can go a long way in minimizing the outcome of the disease especially amongst pregnant women. World Health Organization have advocated for the management of malaria infections at home by mothers/caregivers before seeking help from any nearby healthcare outlet[2].

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The study protocol was performed according to the Helsinki declaration and approved by Postgraduate committee of the Department of Zoology and Environmental Biology, Michael Okpara University of Agriculture, Umudike. Informed consents were obtained from pregnant women who attended Primary Health Care Centre and Abia State University Teaching Hospital.

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There is little information in the literature on effects of different management strategies of malaria prevalence amongst pregnant women. The study aimed at assessing and comparing the impact of home management of malaria prevalence amongst pregnant women in Aba South Local Government Area, Eastern Nigeria.

## 2. Materials and methods

### 2.1. Ethical consideration

The study protocol was approved by the Postgraduate committee of the Department of Zoology and Environmental Biology, Michael Okpara University of Agriculture, Umudike before commencing the work. Permission was then taken from the Head of Haematology and Blood Transfusion Department of Abia State University Teaching Hospital as well as from the Head of Departments, Primary Health Care Centre, Aba South to work with pregnant women who attended their antenatal routine checkup. After the purpose of the study was carefully explained to the subjects, their informed consents were obtained before administering the questionnaire.

### 2.2. Study area

This investigation was carried out in selected areas of Aba, Aba South Local Government Area of Abia State. Aba is characterized by tropical climate with distinct wet and dry seasons spanning March–October and November–February, respectively. It is located between latitude 5°7' N and longitude 7°22' E (Detailed characteristics of the area have been presented by Amaechi and Ukpai[7]). The inhabitants are mainly traders, farmers, artisans with a few civil servants. Aba is a city with infrastructural facilities, tertiary institutions of which are Abia State University Teaching Hospital, a few private clinics and Primary Health Care Centres. The major religion is Christianity. The average humidity is 90% with an average temperature of 27 °C and an average rainfall of about 2400 mm. The major agricultural crops grown includes yam, maize, plantain, cassava, oil palm and vegetables. Flood is widespread in the rainy season creating breeding sites for mosquito vectors and ideal transmission conditions for malaria.

### 2.3. Study population

A total of 432 pregnant women between the ages of 15 and 45 years who came for their antenatal routine checkup at Abia State University Teaching Hospital and Primary Health Care Centre, Aba South Local Government Area, Abia State between May and September, 2013 were selected for this study. They were selected randomly without prior knowledge of their clinical and family history. Voluntary informed consent was obtained after each pregnant woman was given information regarding the research objectives and assurance of confidentiality.

### 2.4. Collection of blood samples

Safety procedures were adopted in the collection of finger-prick blood samples by swabbing the area to be sampled with 70%

alcohol and allowed to dry before collection using a sterile lancet as described by Cheesbrough[8]. On the same slide, thick and thin blood films were made and labeled accordingly after which 10% of Giemsa solution was used to stain the blood films while methanol was used to fix the thin blood films for 2 min. This was done to allow for proper detection of malaria parasite and identification of the presence of *Plasmodium* species[9]. Furthermore, the diluted stain was placed on the slides covering the thick and thin blood films, which was allowed to stand for 30 min, after which was washed off. The slide was cleaned and then placed in a draining rack to allow air to dry. Microscopically, the blood films were examined using 100× oil immersion objective lens. Thick blood films were then examined to find out the presence of malaria parasite while the examination of thin blood film was for the identification of the presence of *Plasmodium* species using the method as outlined by Cheesbrough[8].

### 2.5. Data collection

Structured questionnaires were administered to the women containing questions on home management practices and their treatment seeking behaviour when malaria complications were suspected. Those who could not read or write were guided by the researcher to respond to the questionnaire.

### 2.6. Data analysis

Data collected on peoples' knowledge, attitudes and practices were managed and analyzed using computer program SPSS version 17.0. *Chi-square* ( $\chi^2$ ) test was calculated to determine the different associations of the variables. Significant level was placed at  $P < 0.05$ .

## 3. Results

In Table 1, a total of 192 (44.4%) of the respondents indicated that they used insecticide treated nets (ITNs) as their home based practices for malaria prevention while 126 (29.2%) of the respondents indicated that they combined more than one management practices. Only about 58 (13.4%) used insecticides spray, and 15 (3.5%) slept under a fan while 29 (6.7%) preferred mosquito coil. ITNs had the highest impact 52 (27.1%) on malaria prevention while fan had the lowest impact 13 (86.7%).

**Table 1**

Home management practices used in relation to malaria prevalence [ $n$  (%)].

| Home management practices      | Respondents | Positive for malaria parasite |
|--------------------------------|-------------|-------------------------------|
| Use of insecticide treated net | 192 (44.4)  | 52 (27.1)                     |
| Use of insecticides            | 58 (13.4)   | 30 (51.7)                     |
| Use of mosquito coil           | 29 (6.7)    | 21 (72.4)                     |
| Wearing of long sleeves        | 5 (1.2)     | 4 (80.0)                      |
| Use of fan                     | 15 (3.5)    | 13 (86.7)                     |
| Use of insect repellent cream  | 4 (0.9)     | 3 (75.0)                      |
| Burning of local plants        | 3 (0.7)     | 1 (33.3)                      |
| Multiple choices               | 126 (29.2)  | 48 (38.1)                     |
| Total                          | 432 (100.0) | 173 (40.0)                    |

$\chi^2 = 47.532$ ;  $df = 7$ ;  $P < 0.05$  (Significant).

#### 4. Discussion

Globally, malaria is known to be a major public health problem that many countries experience much death and economic losses associated with ill health especially amongst pregnant women with low immune system. This investigation revealed that the majority of the subjects in Aba South Local Government Area of Abia State practiced home-based management of malaria. Malaria in pregnancy has been found to be linked to a lot of health complications that include maternal anemia, low birth weight as a result of uterine growth retardation and pre-term birth, which are vital contributors to infant morbidity and mortality[10]. This investigation revealed that majority of pregnant women in the study area practiced home-based management of malaria due to varied reasons ranging from the bureaucratic bottlenecks in most government hospitals that are relatively affordable as compared to their private counterparts, which have affected health seeking behavior in most pregnant patients resulting in dissatisfaction. Other reasons bothered on far distance of the hospitals and health centre from homes, poverty, ignorance and low level of education.

The study revealed that most of the respondents (44.4%) were found to have ITNs and also utilized them as the means of protection against mosquito vector. The high patronage of the ITNs may have resulted in the much reduced malaria prevalence recorded amongst the respondents (27.1%) as compared to 86.7% prevalence recorded amongst those who reported as not using ITNs. This finding is similar to that of Ntonifor and Veyufambom in Cameroon who reported a low prevalence amongst pregnant women and children who had the ITNs and were found to also utilize them[11]. This confirmed the assertion of Nzayirambaho *et al.*[12] and Adeneye *et al.*[13] that stated that on control measures to reduce malaria, the most promising measure is the use of ITNs and curtains.

Other measures used included burning of local plants around homes. This was done because the plants were readily accessible, eco-friendly and cost effective. It had the ability to repel mosquito vectors and was effective and potent as was seen in the reduced prevalence of malaria in respondents (33.3%). Similar result was observed by Innocent *et al.* in rural communities of Tanzania[14]. Other less effective modes of home management utilized by the respondents were the use of mosquito coil that was recorded to have a prevalence of 72.4% and wearing long coverings (80.0%). However, the need for regular and proper sensitization and education on the proper use of this mosquito repellent plants amongst pregnant women and other vulnerable group are advocated[15]. This will help to improve the current interventions both at individual and community level towards mosquito and malaria control strategies.

#### Conflict of interest statement

We declare that we have no conflict of interest.

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