

Prevalence and control of Malaria in Pregnant Antenatal Mothers at Main Hospital, Iganga District, Eastern Uganda.

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ABSTRACT

Malaria is a protozoal disease caused by Plasmodium spp parasite transmitted by an infected female mosquito as it bites the human host. It is one of the most common causes of infectious disease related deaths in the World with Africa bearing the largest proportion of the world's malaria burden because the region hosts the anopheles mosquito which is the most efficient malaria vectors, and also due to lack of the basic infrastructure and resources necessary for efficient and sustainable control of the malaria disease. Despite the wide control strategies, occurrence of malaria is on the increase with an estimated incidence rate of 37% globally and 42% in Africa. In Uganda, malaria is the leading cause of morbidity and mortality and is responsible for 40% of all outpatient visits, 25% of all hospital admission and 14% of all hospital deaths. The study objective was to determine the prevalence of malaria and associated control methods among pregnant women attending focused antenatal care at Iganga Main Hospital, Iganga District. A descriptive cross sectional study was conducted in June 2017 at Antenatal Care Clinic, Iganga Main Hospital, and Iganga District, Uganda. Quantitative data was collected by means of questionnaires covering a study population of 126 pregnant mothers where a systematic random sampling method was used. 52/126 (41.3%) were found positive to malaria parasites and majority of pregnant women were aged 20-30 years, these had highest infection rate of 44.2% (38/86), with primigravidas having the highest infection rate of 54.8%. It was also observed that according to gestational age of pregnancy, women of first trimester had the highest prevalence of 68.3% (28/41). The study showed that the most common barrier method used to prevent malaria was treated mosquito nets with 76/126 (60.3%). In general, pregnant mothers had fair knowledge about malaria control methods. Despite focused antenatal care and the awareness on malaria control methods, a malaria prevalence of 41.3% was scored. Therefore interventions aimed at social and behaviour change are necessary to address the gaps highlighted by the study.

Keywords: Malaria, mosquito, Plasmodium, mosquito nets

INTRODUCTION

Malaria is a protozoal disease caused by Plasmodium spp parasites. It is transmitted by an infected female mosquito as it bites the human host [1]. The protozoa that cause malaria worldwide include Plasmodium falciparum, Plasmodium malariae, Plasmodium ovale and Plasmodium vivax. However, Plasmodium falciparum causes the most febrile disease [1, 2].

Malaria caused by Plasmodium falciparum is a febrile disease mostly affecting Sub Saharan Africa [3, 4, and 5]. Malaria is endemic in tropical Africa due to presence

of anopheles mosquitoes which are the vectors [6]. It is one of the most common causes of infectious disease related deaths in the World [6, 7, and 8]. It is a major health problem in developing countries causing considerable morbidity and mortality especially in Sub Saharan Africa [5, 9].

Africa bears the largest proportion of the world's malaria burden [10]. This is due to Plasmodium falciparum which causes the most difficult to treat and severe form of malaria, the region hosts the anopheles mosquito which is the most efficient

malaria vectors, and also due to lack of the basic infrastructure and resources necessary for efficient and sustainable control of the malaria disease [8, 9, 10].

There is an increasing risk of the disease in pregnant mothers and the infants than other human categories [11-14]. Children under five years and pregnant women are at risk because of low immunity against the disease. In endemic areas, the frequency and severity of malaria increases with pregnancy [15-19]. Uganda ranks third in malaria burden in Africa in which 95% of the countries are malaria endemic [10].

Therefore malaria is one of the most important diseases in Uganda, causing significant morbidity, mortality and negative socio-economic impact. Malaria is responsible for 30-50% of outpatient visits and 35% of admissions [20-24].

Pregnancy exacerbates malaria through a non-specific activity of immune system, the protective antiplasmodial activity is suppressed at pregnancy and this has a clinical consequence [5, 25, and 26]. Women therefore become more susceptible to malaria upon during pregnancy.

Pregnant women in malaria endemic areas don't always receive the necessary prevention and treatment they need, this contributes to an increased number of maternal and infant death caused by malaria [18, 27, 28, 29]. Studies have shown that 40% of pregnant women come to antenatal clinics in 2nd trimester of their pregnancy missing out on the ITNs, which are part of the preventive package delivered during first trimester ANC visit that would provide additional protection as well as protection for the newborns.

Despite a number of studies conducted over last decades, additional evidence is still required to understand how best to control malaria. Innovative approaches to malaria control targeting high-risk populations are urgently needed to achieve these goals. For formulation of strategies to control malaria in pregnant women, it is a prerequisite to determine the extent of the disease among the pregnant mothers. It is on this basis that studies should be carried to establish the

level of malaria burden in this high risk population.

Problem Statements.

Malaria caused by *P.falciparum* is a great health burden in sub-Saharan Africa where it is endemic [30, 31]. In pregnancy, malaria is an obstetric, social and medical problem that requires multidisciplinary control strategies [31]. It is one of the major causes of maternal morbidity, mortality and infant mortality globally [32, 33]. Despite the wide control strategies, occurrence of malaria is on the increase with an estimated incidence rate of 37% globally and 42% in Africa [34, 35]. In Uganda, malaria is the leading cause of morbidity and mortality and is responsible for 40% of all outpatient visits, 25% of all hospital admission and 14% of all hospital deaths [36]. In eastern Uganda the prevalence of malaria is 37% and this poses a health risk to the pregnant women and their unborn with varying health consequences [37]. This calls for strategies aimed at controlling the malaria disease in this vulnerable population.

The study is aimed at determining the prevalence of malaria among pregnant women attending ANC at Iganga Main Hospital. This knowledge will guide stakeholders in about the malaria burden in pregnant women and formulate appropriate measures for its control.

Aim of the Study

To determine the prevalence of malaria and associated control methods among pregnant women attending focused antenatal care at Iganga Main Hospital, Iganga District.

Specific objectives of the Study

1. To determine the prevalence of malaria among pregnant women attending focused antenatal care at Iganga Main Hospital, Iganga District.
2. To identify the Malaria control methods used by pregnant women attending focused antenatal care at Iganga Main Hospital, Iganga District.

Research Questions

1. What is the prevalence of malaria among pregnant women attending

- focused antenatal care at Iganga main hospital?
2. What are the malaria control methods used by the pregnant women attending focused antenatal care in Iganga?

Justification of the Study

The study was to generate knowledge about the prevalence of malaria among pregnant women and the associated factors. This knowledge will guide stakeholders in formulation of appropriate strategies to control and manage malaria in pregnant women.

METHODOLOGY

Study Design

The study was a descriptive cross sectional study involving collection of quantitative data.

Study Area

The study was conducted at Antenatal Care Clinic, Iganga Main Hospital, Iganga District, Eastern Uganda.

Study Population

The study population involved pregnant women who came for antenatal visit at Iganga Main Hospital during the study period.

Sample Size

The sample size was obtained using Fisher's Formula as below;

$$n = \frac{z^2 pq}{d^2}$$

Where; n=Desired sample size
 Z=Standard deviation at the required degree of accuracy
 P=prevalence 9%
 q=1-P
 d=is the proportion of error the researcher is able to accept.

$$n = \frac{1.96^2 \times 0.09 \times 0.91}{0.05^2}$$

n=125.8
 n= 126 participants

Sampling method

Systematic random sampling method was used to select participants.

Study inclusion and exclusion criteria

Inclusion criteria.

The participants included all pregnant women attending ANC services attending focused antenatal care in Iganga Main Hospital of sound mind and consented to be part of the study to be conducted in May and June, 2017.

Exclusion criteria

All women who were pregnant but refused to consent to the study and those who were mentally ill, deaf or dumb.

Data collection method

Blood samples was taken from participants, wet smears made and slides processed for microscopy was determined the presence of malaria parasites. Malaria control methods were obtained through using close ended questionnaire. The results were entered on the same patient's sheet to complete the required data on the sheet.

Data quality control

To ensure quality control, the blood samples were immediately processed for analysis to determine presence of malaria parasites. Pre-tested questionnaires were used in data collection about the malaria control practices. Completeness of the questionnaires will be ensured.

Data analysis

The data collected from the study was manually analysed and tabulated

Data presentation

Tables were used for data presentation.

Ethical Consideration

The study was carried out after approval of the proposal by the School of Allied Health.

An Introductory Letter from the Administration School of Allied Health Sciences was obtained. Permission was also obtained from the administration of Iganga Main Hospital. Respondents were requested for their consent prior to the study.

Confidentiality was maintained all through the research process and the interviews will be conducted in reasonable privacy.

RESULTS**Socio demographic characteristics of participants**

The study involved 126 participant pregnant mothers. The majority (68.3%) were 20-30years old. Most of the

participants (88.1%) were married and the majority (32.5%) had attained primary level education. Most participants (46%) were peasants (Table 1).

Table 1 Respondents social demographic data.

Age (years)	Frequency	Percentage (%)
<20	17	13.5
20-30	86	68.3
>30	23	18.2
Marital status		
Single	5	4
Married	111	88.1
Divorced	10	7.9
Educational level		
Primary	41	32.5
Secondary	36	28.6
Tertiary	29	23
None	20	15.9
Occupation		
Civil servant	13	10.3
Business personnel	21	16.7
Peasant	58	46
Others	34	27
Religion		
Protestants	28	22.2
Others	53	42.1
Catholic	24	19.0
Muslims	21	16.7

Prevalence of malaria among pregnant mothers

The results show that out of the 126 participants whose blood samples were examined for infection with malaria

parasites, 41.3% tested positive to malaria parasites (*Plasmodium falciparum*). However 58.7% tested negative to malaria parasites (Table 3).

Table 2 prevalence of malaria among pregnant women

Participant's blood sample results	Frequency	Percentage
Infected (malaria parasites present)	52	41.3
Normal (malaria parasites absent)	74	58.7
Total	126	100

Methods used by the pregnant mothers to control malaria

It was observed that the most common barrier method used by the participants to control malaria was treated mosquito nets (60.3%). The least used barrier method was clothes that cover all limbs (6.35%). The most common environmental

method used was cutting grass around homes (53.2%). While the least environmental method used was covering pot holes with sand (16.7%). The most common chemical method used was pesticide spray (60.3%) while the least used was burning indigenous leaves (15.9%). (Table 4)

Table 3 methods used by pregnant mothers to control malaria

Variable	Frequency	Percentage %
Barrier Methods Used		
Plain mosquito nets	18	14.3
Treated mosquito nets	76	60.3
Mesh wire on windows	24	19.05
Clothes to cover all limbs	08	6.35
	126	100
Environmental methods		
Cut grass around homes	67	53.2
Cover pot holes with sand	21	16.7
Stagnant water clearance	38	30.1
	126	100
Chemical control methods		
Repellents	30	23.8
Burning indigenous leaves	20	15.9
Pesticides spray	76	60.3
	126	100

DISCUSSION

Prevalence of malaria among pregnant women

The current study shows a malaria prevalence of 41.3% among participant pregnant mothers. This is relatively higher than the prevalence (37%) in eastern Uganda [37], but lower than the national malaria prevalence of 45% [36].

Reports by Aribodor et al. [38] showed a higher malaria prevalence of 64.4% among pregnant mothers in Nigeria. This was attributed to ineffective use of treated mosquito nets and wrong use of mosquito nets. A study carried out by Medhi et al. [39] observed a malaria prevalence of 38.1% among pregnant women in Sudan. Amira [40], observed a prevalence of 97.8% among women who contracted malaria while a prevalence of 37% was observed among women admitted to Ed-Duweim Teaching Hospital Khartoum.

The prevalence observed in this study is probably because of the widespread and effective use of treated mosquito nets as observed also in this study.

Malaria control methods used by participant pregnant women

The results of the study show various methods used by the participants in the control of malaria. However, the most commonly used methods include insecticide treated mosquito nets (60.3%), pesticide sprays (60.3%), and grass cutting around the home (53.2%).

In current study the majority of the participants (60.3%) used treated mosquito nets. This is similar to a study by Aribodor et al. [38]. This was due to the fact that as pregnant mothers keep on attending antenatal care, they receive free treated mosquito nets.

However, plain nets are suggested as an alternative to the treated nuts because of limited negative effects of insecticide use, avoidance of toxic chemicals at household levels and financial saving.

The result of the current study differs from those of Falade et al. [41] in Nigeria, where only 1.1% of the participants used insecticide treated mosquito nets. This

was attributed to the myth of suffocation and irritability by the treated nets.

The current study also shows that clothes that cover all limbs was the minority

method used at 6.35% of the participant pregnant mothers.

CONCLUSION

The finding of the study revealed a malaria prevalence of 41.3% among pregnant mothers. The most common barrier method used by the participants to control malaria was treated mosquito nets (60.3%). The least used barrier method was clothes that cover all limbs (6.35%). The most common environmental method used was cutting grass around homes (53.2%). While the least environmental method used was covering pot holes with sand (16.7%). The most common chemical method used was pesticide spray (60.3%) while the least used was burning indigenous leaves (15.9%).

The current prevalence of malaria among pregnant mothers is higher than the regional prevalence (37%) of eastern Uganda this threatens the pregnant mothers in the study area. Therefore there is need for more sensitization of pregnant mothers on malaria prevention and control skills.

The study findings were carried out on a smaller sample size therefore cannot be generalized hence there is need to carry out further studies on this subject on a larger population so as to establish the relationship between prevalence of malaria and the associated control methods.

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