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The Presence of Malaria Infection among Pregnant Women: Insights from Jinja Regional Referral Hospital

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ABSTRACT

Malaria, transmitted by female Anopheles mosquitoes and caused by plasmodium, manifests in symptoms like fever, chills, vomiting, and anemia, posing heightened risks to pregnant women and young children. This study investigated malaria prevalence and contributing factors among pregnant women attending antenatal clinics at Jinja Regional Referral Hospital from January to June 2019, employing a retrospective cross-sectional approach utilizing existing records. Throughout the study period, the prevalence of malaria infection remained consistently low at 20%. Socioeconomic status emerged as a significant factor affecting malaria treatment, with lower economic standing correlating with higher incidence. While 80% of participants exhibited knowledge about malaria-related complications and preventive measures such as using insecticide-treated mosquito nets and eliminating stagnant water, 20% lacked this crucial awareness. Notably, a disparity was observed in malaria cases between well-educated and less educated attendees at the health unit, with fewer instances among the more educated individuals. Maternal complications primarily centered around anemia, while occurrences of low birth weight and stillbirth were relatively uncommon, attributed to prompt diagnosis and treatment. The study highlighted fluctuating malaria prevalence, indicating the need for extensive awareness campaigns, particularly concerning intermittent preventive treatment during pregnancy (IPT1 and IPT2). Collaborative efforts involving the community, government, hospitals, and even spouses are crucial to disseminate crucial information. Encouraging the consistent use of insecticide-treated mosquito nets during pregnancy should be emphasized, although this aspect wasn't specifically addressed in the study.

Keywords: Malaria infection, Maternal mortality, Pregnant women, Antenatal care.

INTRODUCTION

The World Health Organization (WHO) defines malaria as a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes [1-3]. Globally, there were an estimated 216 million cases of malaria in 2016, an increase of 5 million cases over 2015 [4]. The African Region carries a disproportionately high share of the global malaria burden with up to 90% of malaria cases and 91% of malaria deaths reported in 2016 [5, 6]. Malaria infection during pregnancy is a significant public health problem with substantial risks for the pregnant woman, her fetus, and the newborn child. Malaria-associated maternal illness and low birth weight are mostly the result of *Plasmodium falciparum* infection and occur predominantly in Africa [4, 7]. Most cases of malaria in pregnancy in areas of stable malaria transmission are asymptomatic [8]. Depending on the endemicity of malaria in an area, it can be expected that 1–50% of pregnant women may carry malaria parasitemia, especially in the placenta, without noticing it [9]. This is attributed to immunity acquired during previous exposures that protect against

clinical malaria [10]. The Uganda clinical guidelines (UCG) indicate that pregnant women are three times more likely to suffer from severe diseases as a result of malarial infection compared with their non-pregnant counterparts and have a mortality rate that approaches 50% [11]. The principal impact of malaria infection is due to the presence of parasites in the placenta, which causes maternal anemia and low birth weight [12]. Beyond the post-partum period, the long-term consequences of malaria during pregnancy on the infant include poor development, behavioral problems, short stature, anemia, and neurological deficits [13-18]. Protection of pregnant women living in malaria-endemic countries has been of particular interest to many malaria-control programs because of this group's higher susceptibility and reduced immunity. Malaria predisposes pregnant to anemia even after delivery [19-25]. WHO recommends the following package of interventions for the prevention and treatment of malaria during pregnancy: use of long-lasting insecticidal nets (LLINs); in all areas with moderate to high malaria transmission in Africa, intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP), as part of antenatal care services; and lastly, prompt diagnosis and effective treatment of malaria infections [18-25], Uganda's overall burden of malaria is still high and its adverse outcomes to the infected mother and the unborn child are widespread. The Malaria Day Report 2018 showed that Uganda contributes 4% of the global malaria burden and the Uganda Ministry of Health (MoH) indicates that the national malaria prevalence is 19% [19]. Although Uganda is regarded as being a malaria-endemic region, the transmission level varies considerably across the country [20]. Therefore, this study was conducted to assess the prevalence of malaria infection and its associated factors among pregnant women attending antenatal clinics at Jinja Regional Referral Hospital.

METHODOLOGY

Study design

A cross-sectional retrospective study was used to collect data from the antenatal clinic records of patients who were diagnosed with malaria in pregnancy from January 2019 to June 2019.

Area of Study

This study was conducted in the Antenatal Clinic at Jinja Regional Referral Hospital. The hospital is located in Jinja district in Eastern Uganda. The hospital has a bed capacity of 600 beds. It is about 80km by road from Kampala, Uganda's capital city. It serves as the referral hospital for the seven districts of Bugiri, Iganga, Jinja, Kaliro, Kamuli, Kayunga and Mayuge.

Study population

The study population included all women attending ANC at Jinja Regional Referral Hospital.

Sample size determination

The sample size required for the study was calculated based on the formula by Kish to estimate a single population proportion [21].

$$N = \frac{Z^2\, p(1-p)}{\delta^2}$$

Where,

N = estimated sample size

P = anticipated proportion of pregnant women with malaria. A similar study at Mulago Hospital found only a prevalence of 14%, so P was taken to be 0.14

Z = standard normal variation ant 95% confidence (1.96)

δ = margin of error (5%)

the calculated sample size will be,

$\frac{1.96^2\, x\, 0.14(1-0.14)}{0.05^2}$ **= 185 samples will be taken.**

Inclusion criteria

Records of pregnant women who attended ANC at Jinja Regional Referral Hospital from January 2019 to June 2019 and tested for malaria.

Exclusion criteria

Pregnant women who did not test for malaria.

Those who attended ANC before January or after June 2019.

Data Collection Tool

The data extraction forms were used to collect data from antenatal clinic records. This contained tasking fill-ups requiring the researcher to fill in as the data is extracted according to the demand of the datasheet.

Sampling procedure and techniques

Convenient sampling was employed to get a list of women who attended ANC and tested for malaria from the register. Then systematic sampling was used to get the sample required. The list was created and numbered from number '1' upwards. Only names with even numbers were selected for the study until the required number 185 was reached.

Data collection methods

The data extraction forms were used to collect data from the antenatal clinic records office. This contained tasking fill-ups requiring the researcher to fill in as the data is extracted according to the demand of the datasheet.

Data processing and analysis

The checklist was checked for completeness, and missed values and then manually cleaned up on such indications before leaving the study area. Data was coded and entered into IBM SPSS version 25. Data was then cross-checked for consistency and accuracy, after data clearing, data was analyzed and presented in tables and charts. A chi-square test was done to find the risk factors of malaria in pregnancy.

Ethical Consideration

An introductory letter was provided by the director of postgraduate research to allow the researcher to carry out data collection. A letter of acceptance from the in charge and record management was sought to ease access to the records. The names of the participants were not used but only initials were used. Data was kept in a locker to avoid accessibility by other individuals. Data was used only for research purposes.

RESULTS

Age of Respondents

Table 1: Age distribution of the respondents

Age in Years	Number Of Respondents	Percentage%
15-24	**40**	**22**
25-34	**65**	**35**
35-44	**50**	**27**
45-54	**30**	**16**
TOTAL	**185**	**100**

According to the table above, most of the respondents were aged between 25-34(35%), followed by the age range of 35-44(27%), age of between 15-24, (22%) of the total respondents, while the within 45-54(16%).

Level of Education

Table 2: level of education of the respondents

Education Level	Frequency	Percentage (%)
Informal education	20	11
Primary	31	17
Secondary	49	26
Tertiary	85	46
TOTAL	**185**	**100**

The table above shows that the majority of the respondents 85(46%) had a tertiary status of education, 49(26%) had a secondary school education, 31(17%) had at least a primary level of education, and finally 20(11%), Who never had informal education.

Marital Status

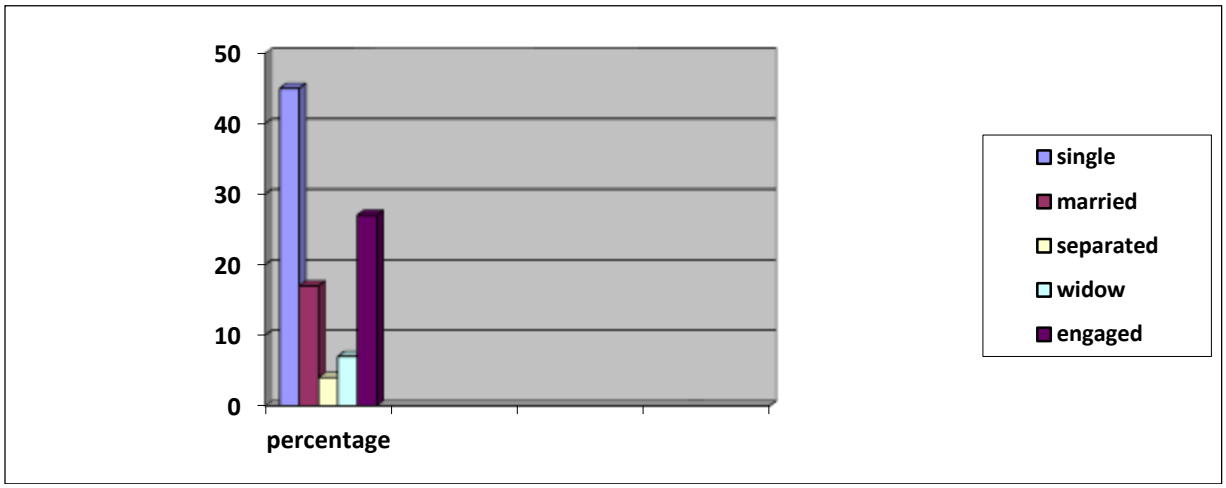

Figure 1: Marital status of the respondents

From the findings, most of the respondents were young females who were single (24%) followed by the married respondents who were (40%), and the widowed/separated female who were (36%).

Occupation of the Respondent

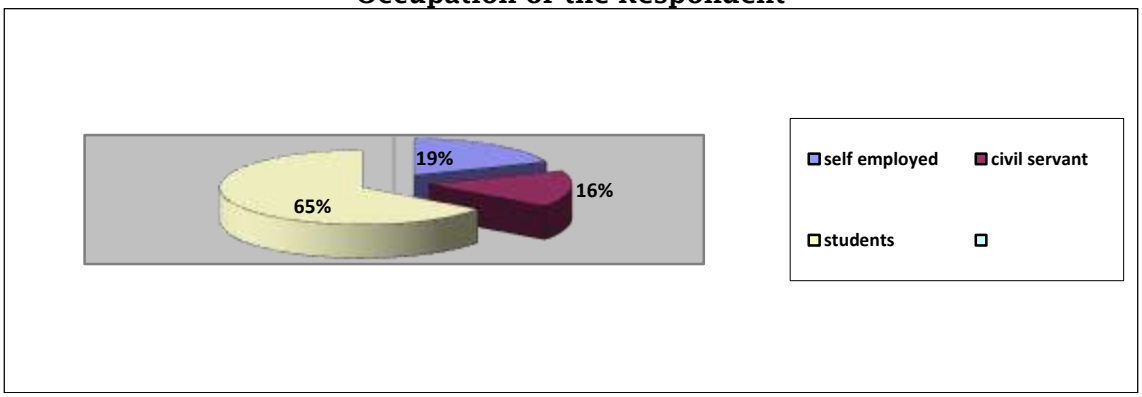

Figure 2: respondent's occupation

Most of the respondents (66%) were self-employed, followed by (20%) employed and finally (14%) were students who were interviewed.

Religion of Respondents

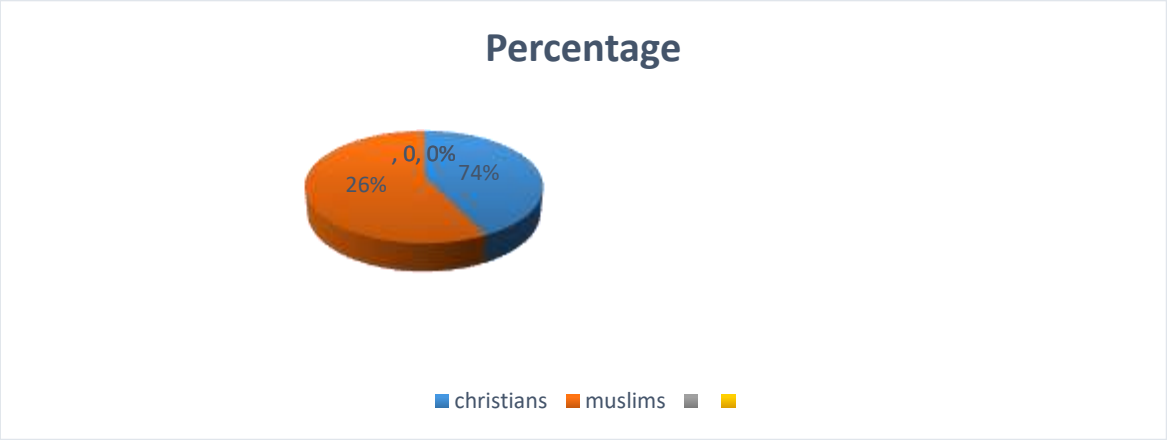

Figure 3: Respondent's religion

The majority of respondents by religion (74%) were Christians while the minority (26%) were Muslims.

Occurrence of Type of Obstetric Factors Associated with Malaria Among Pregnant Mothers.

Table 3: Respondent by obstetrics factors associated with malaria in pregnancy.

Conditions	Frequency	Percentage (%)
Maternal anemia	70	38
Spontaneous abortion	40	22
Stillbirth	38	21
Prematurity and low birth weight	37	20
Total	**185**	**100**

The table above shows the distribution of obstetrics factors associated with malaria in pregnancy which includes occurrence of health conditions in pregnant mothers who attended Jinja Regional referral hospital during the period of research, shows the occurrence maternal anemia 70(38%), spontaneous abortion 40(22%), stillbirth 38(21%), prematurity and low birth weight 37(20%).

Occurrence of other Health Conditions

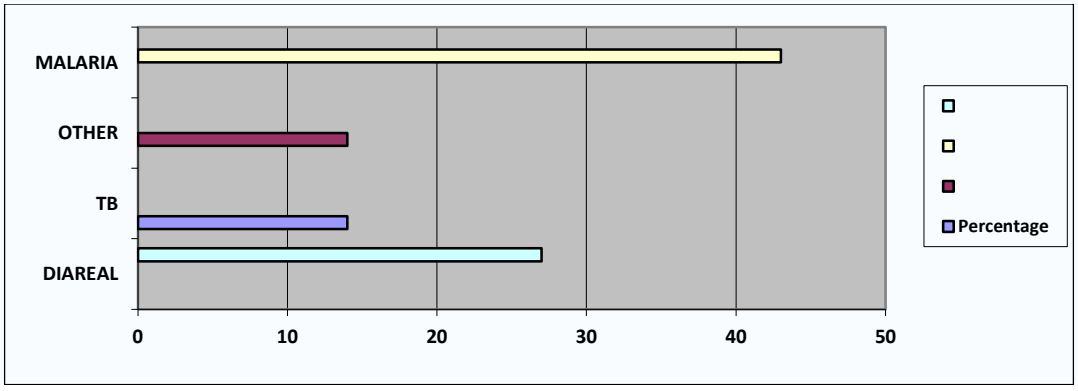

Figure 4: Distribution occurrence of other Health Conditions

Prevalence of Malaria Among Pregnant Mothers Attending Antenatal Clinic.

Figure 5: Prevalence of malaria among pregnant mothers attending antenatal clinic

The prevalence of malaria among pregnant mothers attending the antenatal clinic at Jinja referral hospital was 20% among the sample size of 185 mothers. The majority of the respondents 80% had knowledge about malaria preventive measures including the use of Insecticide-treated mosquito nets, clearing nearby bushes, and draining stagnant water, while 20% of the respondents had no knowledge of prevention barriers.

DISCUSSION

Socio-demographic factors

According to the study findings, respondents by age indicates that the majority of respondents 65(35%) were between the ages of 25 and 34 years of age because this is the age which is reproductively active and most of them are pre-exposed to malaria and its complications as a result of not using malaria preventive measures, then 35 to 44 years were 50(27%) and 40(22%) were between the ages of 15-24 years and lastly age of between 45 – 54 years were 30(16%). The respondents by sex indicated that all respondents were females, 185 (100%) who attended Jinja Regional Referral Hospital. Respondents by education level show that most of the respondents 85(46%) had tertiary education which shows that at least they have ever heard of malaria and its associated complication factors, preventive barriers in pregnant mothers, and the causes and complications of malaria in pregnant mothers in pregnancy, causes and management, followed by 49(29%) who had secondary education, which shows that they had some knowledge on malaria and associated complications like anemia and its complications. The primary level of education was 31(17%) and finally without formal education were 20(11%) which means that they have no knowledge of malaria-associated complications and preventive barriers. Respondents by occupation show that the majority of respondents (66%) were self-employed, employed (20%) who had purchasing power for malaria preventive barriers, and (14%) were students who have knowledge of malaria preventive barriers and causes and complications of malaria in pregnant mothers but could not purchase the preventive barriers like mosquito nets. Respondents by religion show that most of the respondents (74%) were Christians, followed by (26%) of the respondents who were Muslims, this shows that most of the residents are Christians who are either pre-exposed to malaria due to not using

malaria preventive barriers. Therefore, this leads to malaria in pregnancy or its complications, or are victims of complications of malaria in pregnancy.

Associated factors (complications)

Malaria associated obstetric complications mostly occurred included maternal anemia 70(38%), spontaneous abortion 40(22%), still birth 38(21%) and prematurity and low birth weight 37(20%). Other health conditions in pregnant mothers, were diarrheal diseases (40%), tuberculosis (8%), and finally others 12(12%), like malnutrition, ulcers, etc. The prevalence of malaria in pregnant mothers attending the antenatal clinic at Jinja Referral Hospital was 20% among the study population.

CONCLUSION

The prevalence of malaria in pregnant mothers attending the antenatal clinic at Jinja Referral Hospital was 20% among the study population. 80% had knowledge about malaria-associated complications, and preventive measures including the use of Insecticide-treated mosquito nets, clearing nearby bushes, and draining stagnant water, while 20% of the respondents had no knowledge of prevention measures.

Recommendation

To the settings, the role played by the hospital is very commendable however; full details of patients' backgrounds need to be documented and kept in records. This helps studies to follow some aspects of the participants and be able to document all the likely issues of the study. Sensitization of the community about IPT since it seems the government is broadly emphasizing mosquito prevention. Massive awareness of the aspects and burden of malaria in pregnancy needs to be availed. This should be through council leaders, Village Health Teams, Church leaders, and most importantly spouses who need to take charge of the wives accompanying them to the hospital whenever needed or during antenatal services. Community mobilization on identifying breeding sites for mosquitoes and sterilizing them through clearing bushes and destroying stagnant water. Also encouraging mothers to use insecticide-treated bed nets. Families should enroll in family planning programs for birth control to control both populations and attain manageable families where needs can easily be harmonized. Much more overcrowding increases the chances of mosquito bites.

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