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Enhancing IPTp Program Implementation: Provider Practices, Challenges, and Malaria Prevalence among Pregnant Women in Uganda

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ABSTRACT

Malaria remains a formidable public health threat, particularly in sub-Saharan Africa, where pregnant women face heightened vulnerability. Intermittent Preventive Treatment in pregnancy with Sulfadoxine-Pyrimethamine (IPTp-SP) stands as a pivotal strategy in malaria prevention efforts. However, its full potential is hindered by challenges in implementation. This study, conducted at Bushenyi Health Centre IV in Uganda, scrutinized provider practices, challenges encountered, and malaria prevalence among pregnant women attending antenatal care services. Through a descriptive cross-sectional approach involving 151 pregnant mothers and 15 antenatal care providers, analysis revealed noteworthy insights. While a majority of pregnant women received IPTp-SP, adherence to WHO guidelines regarding administration timing and frequency was suboptimal. Notably, over half of the providers reported stockouts of IPTp-SP, leading to significant delays in replenishment and impeding service delivery. Moreover, providers identified a crucial link between women's knowledge and IPTp uptake. The study also uncovered a malaria prevalence of 7.9% among pregnant women. These findings underscore the urgent need to address implementation challenges, particularly in supply chain management and health education, to fortify malaria prevention strategies for pregnant women in Uganda.

Keywords: Malaria, Pregnant women, IPTp-SP, Antenatal care, Implementation challenges, Supply chain management, Health education, Uganda.

INTRODUCTION

Malaria is an infectious disease caused by *plasmodium* parasite transmitted by female infected *anopheles mosquito* (vector) bites, whose breeding is favoured by warmth, humid factors[1–3]. Malaria is a major public health problem, globally affecting between 300–500 million people annually and primarily affecting sub-Saharan Africa where predisposing factors like poverty, breeding weather for vector among others are found [4, 5]. There were 211 million cases of malaria in 2015, 216 million cases in 2016 which showed a slight increase, and 445 000 estimated deaths in 2016 which was similar that of 2015 (446 000)[6, 7]. The WHO African Region continues to carry a disproportionately high share of the global malaria burden. In 2016, the region was home to 90% of malaria cases and 91% of malaria deaths. Some 15 countries in sub-Saharan Africa accounted for 80% of the global malaria burden except India.

Despite the numbers of under-5 malaria deaths having declined from 440 000 in 2010 to 285 000 in 2016, Malaria is still a major killer of children under five years old in endemic areas, taking the life of a child every two minute [8]. Children under five (5) years are have greater susceptibility to infection, morbidity and mortality; and more than two thirds (70%) of all malaria deaths occur in this age group. Furthermore, over 35 million pregnant women are at risk in malaria endemic countries in sub-Saharan Africa [9]. However, in Uganda the whole population is at risk therefore all pregnant women in Uganda are at a risk of malaria infection [10, 11].

Malaria infection during pregnancy is associated with potential risks to both the mother and baby. In areas with stable transmission due to exposure to infectious bites, gradual development of partial protective immunity is acquired with age. Although malaria is a childhood disease, one exception to this general rule is malaria in pregnancy (PAM), because despite of their semi-immune status, women become more susceptible to malaria upon pregnancy[12–15]. Disease presentation during pregnancy varies with the degree of preexisting immunity, some develop symptoms and others remain asymptomatic. In areas with high transmission low birth weight and maternal anemia are the main effects of placental infections which tend to be more severe in the first pregnancies and younger mothers. However, in low transmission areas effects are less marked by gravidity. It can lead to miscarriage, premature

delivery, low birth weight, congenital infection, and/ or perinatal death. Although the mechanism is poorly understood, pregnant women have a weakened immune system and therefore respond less effectively to the clearance of malaria infections. In addition, malaria parasites sequester and replicate in the placenta leading to parasitemia. This attributes to the likelihood of a pregnant woman developing a severe disease than non-pregnant women acquiring infections from the same area [4, 13].

The World Health Organization (WHO) guidelines for the prevention of malaria during pregnancy include; use of IPTp-SP and sleeping under an insecticide-treated bed net (ITN). IPTp-SP is provision of treatment doses of SP to asymptomatic individuals living in malaria endemic regions, regardless of malaria parasitemia status [16]. IPTp is a full therapeutic course of anti-malarial medicine given to pregnant women at routine antenatal care visits. In areas with high risk of P. falciparum, pregnant women should be tested for malaria at regular interval during antenatal care visits. All women with positive(s) test(s) receive a 3day course of ACT[17]. Women with negative(s) test(s) receive SP single dose (3 tabs) every month from 13 weeks to end of the pregnancy–IPTp can be given all the way up to term (with an interval of one month between doses). There are no restrictions after 36 WOA. Since most HIV positive pregnant women will be on Cotrimoxazole, there is no need for IPTp. IPTp reduces maternal malaria episodes, maternal and foetal anaemia, placental parasitaemia, low birth weight, and neonatal mortality[18].

Through the president's malaria initiative with the goal of reducing malaria-related deaths in Uganda by 50%, practical innovative approaches to malaria control targeting high risk populations are urgently needed and policy adherence to IPTp administration is one of them. Effective IPTp administration to pregnant women reduces malaria risk and associated deleterious effects in this population.

Malaria is endemic in Uganda where everyone in the country is at risk including the pregnant women who are among the most vulnerable and yet disease in these people affects both the mother and unborn baby i.e. 2 lives at ago. Approximately 30 million pregnancies occur each year in malaria endemic areas of sub-Saharan Africa such as Uganda. Severe complications of malaria during pregnancy include cerebral malaria, maternal anaemia, and maternal mortality, which tend to be more frequent during epidemics. Complications affecting the foetus or newborn may arise from either clinical malaria or asymptomatic parasitemia during pregnancy and include miscarriage, stillbirth, low birth weight, preterm delivery, and neonatal mortality [16].

Although approximately 35 million pregnant women could benefit from IPTp each year, WHO in the last few years has recognised a declining effort to scale-up IPTp in a number of African countries, therefore, IPTp lags behind other malaria control measures. However, this appears not to be due to low levels of antenatal clinic attendance but uncertainty SP administration for IPTp among health workers may have played a role, [9]. Thus this study determined the provider practices on IPTp program, challenges faced and prevalence of malaria among pregnant women attending antenatal care services at Bushenyi Health Centre IV.

METHODOLOGY

Study design

This was a hospital based descriptive cross-sectional study among pregnant mothers.

Study area

The study was carried out in Bushenyi Health Centre IV, located in Ishaka-Bushenyi Municipality, Bushenyi district in the western part of Uganda. The district covers an area of approximately 3949 square kilometres and boarders with Mbarara district to the east, Ntungamo district to the south-west, Kasese and Kamwengye districts to the north. As per the 2014 census, the district has a population of 41063 per square kilometres. It is located approximately 76 kilometers (47 mi), by road, west of Mbarara, the largest city in the sub-region and 325 kilometers from Kampala, the capital city of Uganda.

Study population

The population was pregnant women attending antenatal care services at Bushenyi Health Centre IV during the time of the study.

Inclusion criteria

All pregnant women attending antenatal care at Bushenyi Health Center IV.

Exclusion criteria

Women who declined consent to the study.

Sample size determination

The sample size was determined using Kish-Leslie formula

$n=Z^2P(1-P)/E^2$

n=Estimated minimum sample size required

P=11.1% [19]

Z=1.96(For 95% confidence interval)

e=Margin of error set at 5%

$n=1.96^2\times0.111(1-0.111)/0.05^2$

n=151, Therefore, a sample of 151 participants was used in this study. The researcher added 10% (15)Health workers as study participants. Therefore, the study included 151 pregnant mothers and 15 antenatal care providers.

Sampling method

Simple random sampling method was used. Numbers were assigned to the study participants and picked randomly till the target sample was obtained.

Data collection and management.

Data was collected using a structured questionnaire designed in-house. This was administered to the participants to gather relevant information regarding the objectives of the study.

Analysis of data

Data was cleaned, coded and entered into Microsoft excel. Data analysis was done using SPSS version 20. Descriptive data was presented using frequency tables, pie charts and graphs.

Quality control

Data collection team was trained prior to data collection and pretesting of the questionnaire outside the study setting was done.

Data was checked for completeness and accuracy.

Ethical considerations

Approval and permission was sought from Kampala International University Ethical clearance committee and a letter of introduction was given by the faculty. Due care was taken to ensure that all those who accepted to participate in the study did so voluntarily, and gave their informed consent. They were informed that any information collected during the course of the study were kept confidential and that no personal name appeared on research documents.

RESULTS

Socio-demographic factors

Among the 151 participants in the study, the majority (49.0%) were aged 21–29, had a parity of 3–4 (45.0%), attained secondary or tertiary education (50.3%), and were married (78.8%). Only 27.2% of the participants were employed, as shown in Table 1 below.

Table 1: Socio-demographic Factors of the Respondents.

Variable	Frequency(N=151)	Percentage (%)
Age		
≤20	27	17.9
21-29	74	49.0
≥30	50	33.1
Parity		
1-2	49	32.5
3-4	68	45.0
≥5	34	22.5
Level of education		
No formal education	23	15.2
Primary	52	34.4
Secondary/Tertiary	76	50.3
Marital status		
Married	119	78.8
Single	32	21.2
Employment status		
Employed	41	27.2
Unemployed	110	72.8

Prevalence of malaria in pregnancy

Among the 151 pregnant mothers enrolled in the study, 12 were diagnosed with malaria during pregnancy, giving a prevalence of 7.9%, as shown in the figure below.

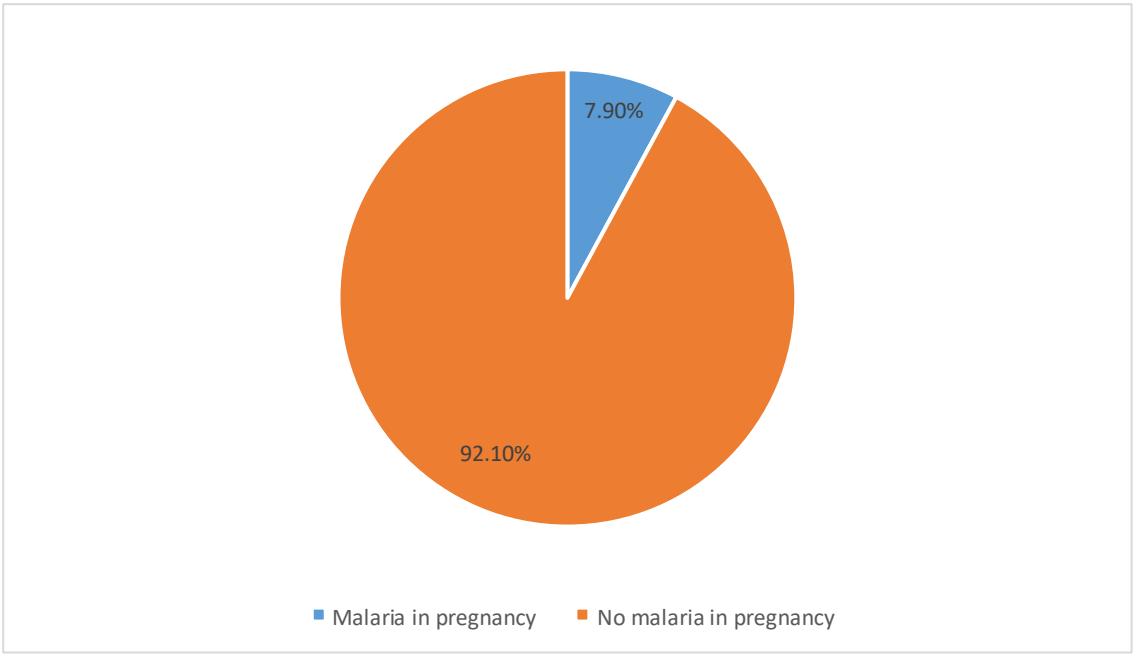

Figure 1: Prevalence of Malaria in Pregnancy

Practices on Sulfadoxine-Pyremethamine

Table 2 below shows that the majority (68.9%) had their first ANC visit in the second trimester, have taken fansider (92.1%), began taking it in the second trimester (64.9%), and take it monthly (72.8%).

Table 2: Practices on Sulfadoxine-pyremethamine

Variable	Frequency(N=151)	Percentage (%)
When was your first visit to the ANC clinic?		
First trimester	24	15.9
Second trimester	104	68.9
Third trimester	23	15.2
Have you taken Fansider before?		
Yes	139	92.1
No	12	7.9
When did you begin taking fansider?		
First trimester	05	3.3
Second trimester	98	64.9
Third trimester	48	31.8
How often do you take fansider?		
Infrequently	19	12.6
Monthly	110	72.8
At least 2 months apart	22	14.6

Challenges faced by antenatal care providers in the administration of sulfadoxine-pyremethamine

More than half (53.3%) reported that they at times experienced stockouts of fansider. 53.3% reported that it takes 1-2 months to replenish if it is out of stock; 33.3% and 13.3% reported that they

replenish within 3-5 months and ≥6 months, respectively. Further, the majority (80.0%) responded that women's knowledge affects the uptake of fans, as shown in Table 3 below.

Table 3: Challenges faced by antenatal care providers in the administration of sulfadoxine-pyremethamine

Variable	Frequency(N=15)	Percentage (%)
Do you at times experience stock-outs of fansider?		
Yes	08	53.3
No	07	46.7
How long does it take to be replenished if it is out of stock?		
1-2month	08	53.3
3-5month	05	33.3
≥6month	02	13.3
Do you think women's knowledge affects the uptake of fans? ?		
Yes	12	80.0
No	03	20.0

DISCUSSION

The Plasmodium parasite, which causes malaria, is a fatal illness that affects most of Africa south of the Sahara [20–22]. With a projected 219 million illnesses and 435,000 deaths worldwide in 2017, the illness is still significant for public health despite being preventable, treatable, and garnering current global attention. 93% of these fatalities took place in Africa [23]. The disease is most severe in pregnant women and children under five, with over 70% of all malaria deaths reported among children under five. Pregnancy-related malaria infection is a public health problem because it has a high risk of morbidity and mortality for both the expectant mother and the growing fetus. P. falciparum infection is principally responsible for malaria-associated maternal morbidity and poor birth outcomes, such as preterm delivery and low birth weight, which are most common in Africa [24, 25]. Sulfadoxine-pyrimethamine intermittent preventative therapy (IPTp-SP) for malaria during pregnancy reduces placental parasitaemia and enhances birth outcomes. Currently, during 16 weeks of gestation until birth, WHO advises three or more doses of SP administered during antenatal care (ANC), spaced one month apart. This study determined the provider practices on IPTp program, challenges faced and prevalence of malaria among pregnant women attending antenatal care services at Bushenyi Health Centre IV.

Prevalence of Malaria in Pregnancy

According to the study, the prevalence of malaria in pregnancy was 7.9%.This figure is lower than 8.73% reported by a study in Eastern Uganda [13, 16]. .Additionally, this premise is lower compared to a prevalence of 10.2% reported in Ethiopia [24]. Accordingly, the finding is lower than 41.6% reported in Nigeria [20, 22]. This may be due to improvement in government programs targeting prevention of malaria and compliance of pregnant mothers with various preventive measures like malaria chemoprophylaxis and use of insecticide treated nets.

Practice on Sulfadoxine-pyremethamine

In areas with moderate to high rates of malaria transmission, the WHO advises a three-pronged approach consisting of intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP), use of insecticide-treated bed nets (ITNs), and efficient case management of clinical malaria and anemia [20]. To avoid the negative effects of malaria on maternal and fetal outcomes, intermittent preventive therapy in pregnancy with SP (IPTp-SP) is advised in countries with a high prevalence of malaria, such as Uganda. In the current study, majority (68.9%) of the participants had their first ANC visit in the second trimester. Most (92.1%) reported to have taken fansider by the time of study. This is still lower compared to 93% target of pregnant women to receive at least two doses of SP and 80% to receive at least three doses (optimal doses) in Uganda[13].64.9% of the pregnant women began taking in the second trimester while 72.8% reported to have taken it monthly. The WHO revised its recommendations on IPT-SP in 2012 and now mandates that all pregnant women receive a minimum of three doses of SP at each scheduled antenatal care (ANC) appointment, beginning as early as possible in the second

trimester and spaced out by one month [11].The findings of this study still reveal that some mothers began taking in the first trimester and others in the third trimester. Additionally, some participants were taking SP infrequently whereas others were taking in intervals more than a month. This finding is inconsistent with the WHO recommendations.

Challenges faced in administration of Sulfadoxine-pyremethamine

In the present study, more than half (53.3%) of the respondents reported that they at times experience stock outs of fansider.53.3% reported that it takes 1-2month to replenish if it is out of stock,33.3% and 13.3% reported that they replenish within 3-5months and ≥6months respectively. Further, majority (80.0%) responded that women's knowledge affect uptake of fansider. Although ANC coverage is generally high in African nations, many nations have struggled to attain high levels of IPTp adoption[26,27,28,29]. It implies that there are unutilized opportunities to provide IPTp during ANC. Governments and implementing partners have increased efforts to enhance IPTp uptake by addressing some of the identified bottlenecks, including stock-outs of medications and supplies at ANC clinics and a lack of supervision and advice for health workers[27, 28,29]. However, based on the findings of the study, efforts have not yielded much.

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