

Experiences And Outcomes Of Prenatal Malaria Prophylaxis At The Korle Bu Teaching Hospital

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Abstract

Introduction: Despite efforts of education and widely available prophylaxis, a high number of women still contract malaria during pregnancy. The objectives of the study were to examine the relationship between maternal compliance and satisfaction, and their effect on pregnancy outcomes.

Methods: This was a cross sectional study of post-partum women at the Korle Bu Teaching Hospital from February to April 2019 to collect data on adherence to the standard malaria prophylaxis program, outcome of the pregnancy and satisfaction of prophylaxis services rendered at the antenatal clinic. Knowledge of malaria prophylaxis with sulfadoxine-pyrimethamine (IPTp-SP) and malaria in pregnancy were also assessed. Associations between variables were assessed with a Pearson Chi-square test and a p-value less than 0.05 was considered significant.

Results: Out of the 150 questionnaire administered,

136 (90.7%) were completed and returned. Seventy-six (55.9%) of them received adequate (>3 doses) of IPTp-SP. However, utilization of the insecticide treated net during pregnancy was 49.3%. Thirty-six of the participants 36/136 (26.5%) contracted malaria during the index pregnancy and 2/36 (5.6%) of the children experienced complications due to maternal malaria. Almost all, 135/136 (99.4%) of the women were very satisfied with the malaria prophylaxis services provided at the hospital.

Conclusion: There was adequate uptake of SP among respondents and the women rated services for prophylaxis at the antenatal clinic as satisfactory. However, usage of ITNs was low and more than one in four women delivered at the facility experienced malaria during pregnancy.

Keywords: Malaria, prophylaxis, outcomes, pregnancy

Introduction

Malaria is still a major public health challenge affecting adults, pregnant women and young children.^{1,2,3} There are 25 million pregnant women at risk of malaria infection in sub-Saharan Africa alone each year.⁴ Among 1,655 pregnant women in four adjoining administrative areas of Bono East Region in Ghana, the overall malaria prevalence was 20.4% (95% CI 18.5–22.4%).⁵ Malaria infection during pregnancy can increase the risk of developing adverse outcomes such as maternal anemia, fetal loss, premature delivery, intrauterine growth restriction, and delivery of low birth-weight infant.⁶ One of the strategies for preventing malaria in pregnancy in Ghana is the Intermittent Preventive Treatment of malaria in pregnancy (IPTp) using Sulfadoxine–Pyrimethamine (SP), IPTp-SP. Uptake of higher doses of SP has been reported to significantly improve pregnancy outcomes.⁷ Patients at Korle Bu Teaching Hospital (KBTH) and other hospitals in Ghana usually receive IPTp-SP, are educated on the benefits of taking IPTp-SP and how to avoid mosquito bites at home. However, knowledge, financial, and organizational barriers have been reported to influence uptake of IPTp. Pregnant women not fully aware of the benefits of IPTp and confused over what drugs are safe to take during pregnancy have been reported among knowledge barriers.^{8,9}

Financial barriers include expensive cost of transportation to health facilities for treatment and prioritization of work over antenatal care (ANC) attendance.^{10,11} ANC staffs failing to offer IPTps to patients and confusion among health providers over the timing and dosing of SP are organizational barriers at the healthcare level.^{12,13} Although most major health facilities offer ante natal clinic (ANC) services and have been providing IPTp-SP services since its introduction, information is still lacking on factors that continue to influence low coverage of IPTp-SP among pregnant women. It is therefore important to determine the number of women who adhered to malaria prophylaxis during pregnancy, assess their satisfaction of the chosen prophylaxis and the perinatal outcome. This will show the areas that need more attention in the fight against malaria, the maternal and perinatal killer.

Methods

This cross-sectional study was carried out between February and April 2019 at six postnatal wards of Obstetrics and Gynaecology department of KBTH. KBTH is the leading referral hospital in Ghana, located in Accra. KBTH has over 2000 beds for in-patients and several specialist departments, clinics, wards, pharmacies and reference laboratories. The facility provides clinical care, training and conducts research. Study participants were postnatal women on admission. Written informed consent was obtained from all participants prior to inclusion in this study.

Women who were not fluent in written and spoken English were provided with a brief explanation of the research in their native languages. Participants were informed that consenting to this study was voluntary and there was no consequence for not taking part. All women who recently gave birth at KBTH during the study period were eligible except those with language barrier and had no close relatives to assist in filling the informed consent form, and responding to the questionnaires. The study protocol was approved by the Korle Bu Teaching Hospital and Heads of Departments of Community Health and Obstetrics and Gynaecology. Data from paper-based self-administered questionnaires were coded and entered into excel spread sheet and transferred to Statistical Package for the Social Sciences (SPSS) version 20 for analysis. The relationship between malaria and maternal and perinatal outcomes were investigated and tested for significance using Pearson Chi-square test. $P < 0.05$ was considered statistically significant. Descriptive variables of the data were summarized as frequencies and proportions.

Results

Out of 150 postnatal women recruited from the wards of Obstetrics and Gynaecology department, 136 completed the survey giving a response rate of 90.7%. The participants were between 15 to 49 years of age. Most of the women were either married 78 (59.1%) or co-habiting 27 (20.5%). Eighty-two (60.3%) had secondary or more education. Major-

ity 126 (92.6%) attended 4 or more antenatal clinics before delivery (Table 1). Seventy-six (55.9%) participants had optimal IPTp uptake of 3 doses of Sulphadoxine-Pyrimethamine as prescribed by the hospital for malaria prophylaxis (Figure 1).

Table 1 Sociodemographic characteristics of participants

Characteristic	Frequency (N=136)	Percentage (%)
Age category		
15-20	12	8.8
21-25	24	17.6
26-30	37	27.2
31-35	36	26.5
36-40	22	16.2
41-45	4	2.9
46-49	1	0.7
Educational level		
None	8	5.9
Primary	46	33.8
Secondary	47	34.6
Tertiary	35	25.7
Marital status		
Single	21	15.9
In a relationship	6	4.5
Cohabiting	27	20.5
Married	78	59.1
Undetermined number of deliveries		
1	57	41.6
2	33	24.1
3	27	19.7
4	9	6.6
5+	10	7.3
ANC attendance		
1	3	2.2
2	3	2.2
3	4	2.9
4	6	4.4
5+	120	88.2

Abbreviations: N, Total number of participants; %, percentage of participants

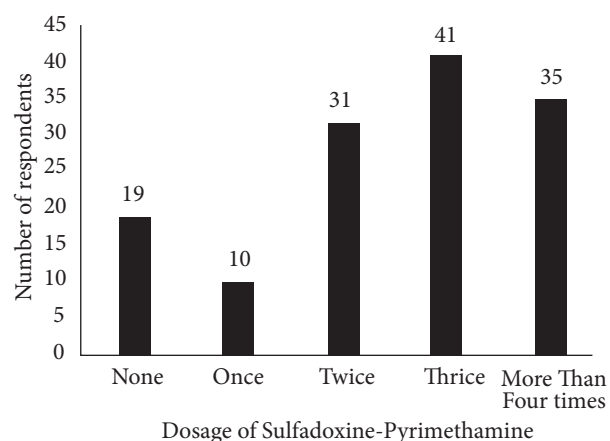


Figure 1 Respondents uptake of Sulphadoxine-Pyrimethamide.

Reasons for not taking the conventional Sulphadoxine-Pyrimethamine were varied including allergic reaction to Sulphur drugs, and not believing in orthodox medications (Table 2).

Table 2 Reasons why women refused IPTp during pregnancy

Reason	Frequency (19)	Percentage
G6PD deficiency	3	15.8
No Reason	2	10.5
Did not go to ANC	2	10.5
Was not given	2	10.5
Thinking that it does not make a difference	1	5.3
Does not believe in Orthodox medicine	1	5.3
Other	8	42.1

For vector preventive measures, only 67 (49.3%) participants used Insecticide Treated Nets (ITNs) as prophylaxis against malaria. The main reasons given for not using ITNs were: they were too hot to sleep under 33 (47.8%), dislike using them 19 (27.5%) and others including; not having many mosquitoes in the house, not having the nets, eyes burning when the nets are used and using fan to drive away mosquitoes. Other additional prophylactic measures used were disposal of stagnant

water to prevent breeding site 55 (40.4 %), Spraying the house 30 (22%), use of mosquito coil 24 (17.6%), use of mosquito repellent 20 (14.7%) and wearing of long sleeves 7 (5.1%). On knowledge of the current malaria program, less than half 63 (46.3%) of the women admitted that they did not know about the current IPTp malaria prophylaxis program. However, although some recognized SP and Chloroquine as malaria prophylaxis (31.8% and 16.3% respectively), none of them knew about Pyrimethamine and Proguanil.

Thirty-six of the participants (26.5%) experienced Malaria during their index pregnancy (self-reported). Three of the 36 women (8.3%) experienced complications of malaria during pregnancy, 2 were admitted due to malaria induced anaemia and 1 had persistent vomiting due to the malaria. Two neonates had malaria related complications and were admitted to neonatal intensive care unit. There was no correlation between the education level of a woman and malaria infection, also taking malaria prophylaxis or using insecticide treated net did not show any significant difference in malaria infection during pregnancy. All the 117 women (100%) who had IPTp-SP were satisfied with malaria prophylaxis services provided at the hospital. Majority, 114/117 (97.4%) found the prophylaxis helpful and will use it again when they are pregnant, 2 (1.7%) said that they found it helpful but they will not use it again and 1 (0.9%) did not think the malaria prophylaxis was helpful. Majority, 112/117 (96%) concluded that it was helpful to their child and that they will use it again when they get pregnant. However, if given preference, 33/117 (28.2%) would choose herbal medication for malaria prophylaxis.

Discussion

The findings of this study suggest a good level of uptake of IPTp-SP at the Korle Bu Teaching Hospital. The research revealed that most women (86%) used the hospital prescribed malaria prophylaxis. Majority (55.4%) of them received 3 doses or more. This is higher than the national figure of 39% of IPTp3 uptake (third dose) reported in the 2014 Ghana Demographic and Health Survey and also

higher than the 23% of IPTp, which was reported by the WHO in 2013.¹⁴ The WHO recommendation emphasizes that pregnant women receive at least two doses of SP during pregnancy. This shows that the IPTp-SP program is well patronized at KBTH. Monitoring and supervisory activities could be contributory to a high commitment of the health staff to the program, leading to the high maternal utilization of IPTp.

The utilization of the insecticide treated nets among respondents in this study was 49%. This was 20% lower than what was reported in a different study investigating utilization of lasting insecticide treated nets among pregnant women in the Wa Municipality in Ghana.¹⁵ A lot of the participants stated it was too hot to sleep under the net and some simply did not like using them. Previous researchers have similarly reported that ITN's are poorly used by pregnant women and a lot of them had poor attitude towards the use of the ITNs.^{15,16} Most women used other means of prophylaxis to prevent being bitten by the malaria vector: disposal of stagnant water in and around the house to prevent breeding of mosquitoes was done by 40.3% and other popular methods such as indoor residual spraying. This is similar to a study done in 2015 by Kapsi et al which stated that the proportion of the population sleeping under an ITN and protected by indoor residual spraying was estimated to be 57%.¹⁷

The benefits of IPTp-SP on reduction of malaria in pregnancy and reduction in the prevalence of maternal anaemia is a confirmed finding which leads to improved and favourable pregnancy outcomes. Over 1 in four (26.5%) of the women sampled had experienced malaria during their index pregnancy. Our finding is similar to the overall malaria prevalence (20.4%) from four adjoining administrative areas of Bono East Region, Ghana.⁵ These results show that, although efforts are being made to reduce malaria prevalence in pregnancy, women are still susceptible to getting malaria during this time.

Maternal satisfaction improves IPTp-SP uptake and reflects the quality of prophylactic services related to malaria prevention among pregnant women at

KBTH. These results are similar to a study done by Amoako & Anto, where the level of uptake of IPTp-SP was observed to be much higher than reports from many other studies in Africa.¹⁸ Almost all the women (97.4%) found taking IPTp-SP helpful however, a significant portion of women (28.2%) still prefers to use herbal medication if they have the choice. This further strengthens a comment made by Awuah et al. that a lot of people especially in African countries are of the view that malaria can be treated or prevented by herbal remedies.¹⁹ They stated in their study that in Ghana and other African countries, home-based remedies involving over-the-counter medications and leftover drugs, as well as the use of herbs, are often the first line treatment for malaria. Individuals only go to treatment facilities if the condition worsens. Reasons for not taking the conventional SP have been attributed to fear of the safety of taking the drug during pregnancy.⁹ Side effects of the medication are also known to contribute to lack of compliance.²⁰

Language barrier was one major limitation encountered in this study. Some of the women were more comfortable using either the local language Ga or Twi so some of the questions in the questionnaire had to be explained. This made many patients not willing to participate making it difficult to get the desired number of participants within the study period. Secondly, some of the women may not have given genuine responses especially regarding satisfaction because they may have been afraid that their responses may implicate their healthcare providers as they were still receiving care in the hospital. A comparative study involving several other settings may give broader picture of the national condition. In spite of these limitations, the study being done in a referral centre supposes patients are from different communities.

In conclusion, the study found majority of wom-

en adhered to the minimum dosage required for malaria prophylaxis during pregnancy. Although some women still experienced malaria during their pregnancy while on the prophylaxis, only a few experienced maternal or perinatal complications associated with malaria. As predicted, the usage of ITNs was quite low but other means of prophylaxis such as elimination of stagnant water around living areas and the use of indoor residual spraying were being used. Most of the women found the prophylaxis service rendered at the Korle Bu Teaching Hospital good and satisfactory. It is therefore, recommended that sensitization programs to improve the utilization of SP and ITNs as well as other preventive measures be continued until 100% uptake is realized.

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Conflict of interest

The authors declare that they have no competing interests.

References

1. Ceesay SJ, Koivogui L, Nahum A, Taal MA, Okebe J, Affara M, et al. Malaria prevalence among young infants in different transmission settings, Africa. *Emerg Infect Dis*. 2015; 21(7):1114–21.
2. Boudová S, Cohee LM, Kalilani-Phiri L, Thesing PC, Kamiza S, Muehlenbachs A, et al. Pregnant women are a reservoir of malaria transmission in Blantyre, Malawi. *Malar J*. 2014; 13(1):1–8.
3. Chaponda EB, Chandramohan D, Michelo C, Mharakurwa S, Chipeta J, Chico RM. High burden of malaria infection in pregnant women in a rural district of Zambia: A cross-sectional study. *Malar J*. 2015;14(1):380.
4. van Spronsen JHM, Schneider TAJ, Atasiige S. Placental malaria and the relationship to pregnancy outcome at Gushegu District Hospital, Northern Ghana. *Tropical Doctor*. 2012;42(2):80-84.
5. Dosoo DK, Chandramohan D, Atibilla D, Oppong FB, Ankrah L, Kayan K, et al. Epidemiology of malaria among pregnant women during their first antenatal clinic visit in the middle belt of Ghana: a cross sectional study. *Malar J*. 2020;19(1):1–12.
6. CDC - Centers for Disease Control and Prevention. Intermittent Preventive Treatment of Malaria for Pregnant Women (IPTp)d Deaths Be Reduced? Intermittent Preventive Treatment of Malaria for Pregnant Women (IPTp) [Internet]. 2018 [cited 2021 Jun 18]. Available from:https://www.cdc.gov/malaria/malaria_worldwide/reduction/iptp.html
7. Anto F, Agongo IH, Asoala V, Awini E, Oduro AR. Intermittent Preventive Treatment of Malaria in Pregnancy: Assessment of the Sulfadoxine- Pyrimethamine Three-Dose Policy on Birth Outcomes in Rural Northern Ghana. *J TropMed*. 2019;2019:10.
8. Onoka CA, Hanson K, Onwujekwe OE. Low coverage of intermittent preventive treatment for malaria in pregnancy in Nigeria: Demand-side influences. *Malar J*. 2012;11(1):1–8.
9. Amoran OE, Ariba AA, Iyaniwura CA. Determinants of intermittent preventive treatment of malaria during pregnancy (IPTp) utilization in a rural town in Western Nigeria. *Reprod Health*. 2012;9(1):12.
10. Iliyasu Z, Gajida AU, Galadanci HS, Abubakar IS, Baba AS, Jibo AM, et al. Adherence to intermittent preventive treatment for malaria in pregnancy in urban Kano, Northern Nigeria. *Pathog Glob Health*. 2012;106(6):323–9.
11. Mutagonda R, Kamuhabwa AAR, Masawe S, Mpembeni R. Intermittent preventive therapy and treatment of malaria during pregnancy: A study of knowledge among pregnant women in Rufiji District, Southern Tanzania. *Trop J Pharm Res*. 2012;11(5):835–45.
12. Ansah-Ofei A, Mwini-Nyaledzigbor P, Affram C. Improving the quality of life of pregnant women using the intermittent preventive treatment with sulphadoxine pyrimethamine (IPT- SP): Experiences from Dangme West District, Ghana. *J Ghana Sci Assoc*. 2012;13(2):88–102.
13. Gross K, Alba S, Schellenberg J, Kessy F, Mayumana I, Obrist B. The combined effect of determinants on coverage of intermittent preventive treatment of malaria during pregnancy in the Kilombero Valley, Tanzania. *Malar J*. 2011;10(1):1–12.
14. Ibrahim H, Maya ET, Issah K, Apanga PA, Bachan EG, Noora CL. Factors influencing uptake of intermittent preventive treatment of malaria in pregnancy using sulphadox-

- ine pyrimethamine in sunyani municipality, Ghana. *Pan Afr Med J.* 2017;28:122.
15. Darko E, Tetteh J, Ayanore MA, Damoah-Aferi I. Socio-demographic determinants associated with ownership and use of long lasting insecticide treated nets among pregnant women in the Wa Municipality of Ghana. *Pan Afr Med J.* 2019;33:81.
 16. Adebayo AM, Akinyemi OO, Cadmus EO. Knowledge of malaria prevention among pregnant women and female caregivers of under-five children in rural southwest Nigeria. *PeerJ.* 2015;3:e792.
 17. Kapisi J, Kakuru A, Jagannathan P, Muhindo MK, Natureeba P, Awori P, et al. Relationships between infection with *Plasmodium falciparum* during pregnancy, measures of placental malaria, and adverse birth outcomes NCT02163447 NCT. *Malar J.* 2017;16(1):400.
 18. Amoako BK, Anto F. Late ANC initiation and factors associated with sub-optimal uptake of sulphadoxine-pyrimethamine in pregnancy: a preliminary study in Cape Coast Metropolis, Ghana. *BMC Pregnancy Childbirth.* 2021;21(1):1–10.
 19. Awuah RB, Asante PY, Sakyi L, Biney AAE, Kushitor MK, Agyei F, et al. Factors associated with treatment-seeking for malaria in urban poor communities in Accra, Ghana. *Malar J.* 2018;17:168.
 20. Odongo CO, Bisaso RK, Byamugisha J, Obua C. Intermittent use of sulphadoxine-pyrimethamine for malaria prevention: a cross-sectional study of knowledge and practices among Ugandan women attending an urban antenatal clinic. *Malar J.* 2014;13(1):399