Original Article

Use of Intermittent Preventive Therapy and Incidence of Acute Malaria in Pregnancy among Postpartum Women at University College Hospital, Ibadan, Nigeria

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Abstract

Background: Malaria in pregnancy remains a significant cause of feto-maternal morbidity and mortality especially in regions of high prevalence like Nigeria. Intermittent preventive therapy (IPT) for malaria is an important measure to abate this menace. **Aim:** The aim is to determine the uptake and effectiveness of IPT in relation to the occurrence of malaria, despite the use of IPT in pregnancy. **Patients, Materials and Methods:** This was a cross-sectional study conducted in UCH, Ibadan from October 1, to December 31, 2020. A total of 150 postpartum women were selected using the total sampling technique of all consenting participants. Structured questionnaires were used for data collection. **Results:** About 87.7% of the respondents took IPT in the index pregnancy. Of these, 15.4%, 50.8%, and 33.8% of participants took one, two, and three doses, respectively. The factors that determined intermittent preventive treatment for malaria in pregnancy (IPTp) uptake include occupation ($P = 0.001$), booking status ($P = 0.002$), antenatal care attendance ($P = 0.001$), and level of IPTp awareness ($P = 0.002$). About 48.0% of respondents indicated that they were treated for malaria in the index pregnancy. Meanwhile, only about 15.3% of those who took IPT were treated for malaria in pregnancy. It was found that the use of IPT ($P = 0.03$) and an increasing number of IPT doses used ($P = 0.03$) were associated with a reduction in the prevalence of malaria in pregnancy. **Conclusion:** The uptake of the current recommendation for IPT-SP that stipulates the use of monthly doses of IPT till delivery with a target of a minimum of three doses was quite poor. There is therefore an urgent need for widespread awareness and implementation of the World Health Organization and national guidelines on prevention of malaria. The prevalence of malaria declined with the number of doses of IPT-SP used by the respondents. This emphasizes the need for adequate dosing of IPT.

Keywords: Intermittent preventive treatment for malaria in pregnancy, malaria in pregnancy, postpartum women, sulfadoxine-pyrimethamine

Introduction

Malaria is a protozoan infection with major public health implications.[1] It potentially affects about 50% of the world's population, majority of whom live in sub-Saharan Africa, with pregnant women and children under five being more vulnerable.[2,3] It is a disease of huge public health significance with an estimated 219 million new cases and 435,000 deaths globally and most of these deaths (93%) occurred in Africa.[4,5] About 30 million women are infected with malaria in pregnancy annually with an estimated 10,000 maternal and 200,000 newborn deaths all over the world.[4,6] In Nigeria, about 11% of maternal death was linked to malaria.[2] Therefore, it remains a significant cause of fetomaternal mortality in our environment.

Access this article online

Quick Response Code:

Website: www.njmonline.org

DOI: 10.4103/NJM.NJM_155_21

To reduce the burden of malaria infection in pregnancy, some interventions were recommended by the World Health Organization (WHO) for the control of malaria in the year 2000.[3] These include the use of insecticide-treated nets, intermittent preventive treatment for malaria in pregnancy (IPTp), and prompt case management of malaria illness. IPT-p using

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How to cite this article: Ifebude JE, Idowu CO, Awolude OA. Use of intermittent preventive therapy and incidence of acute malaria in pregnancy among postpartum women at University College Hospital, Ibadan, Nigeria. Niger J Med 2021;30:701-8.

Submitted: 26-Aug-2021 **Revised:** 15-Nov-2021
Accepted: 16-Nov-2021 **Published:** 27-Dec-2021

sulfadoxine-pyrimethamine (SP) entails the administration of a full treatment dose of SP to pregnant women when they visit antenatal care (ANC) facilities for health services, regardless of whether the pregnant woman has malaria infection or not. Initially, it was administered by providing all pregnant women with a minimum of two doses of sulfadoxine-pyrimethamine during routine antenatal clinics after fetal quickening, both doses administered 1 month apart and not later than 4 weeks from delivery using directly observed therapy.[3] However, in 2012, the WHO recommended a new regimen for administration of IPT-p which states that "In malaria-endemic areas, IPT-sulfadoxine-pyrimethamine (IPT-SP) is recommended for all pregnant women. Dosing should start in the second trimester until delivery, and doses should be given at least 1 month apart with the objective of ensuring that at least three doses are received."[7] This was adopted by the Nigerian national guidelines and strategies for control of malaria during pregnancy in 2014.[8]

The primary significance of IPTp is to clear asymptomatic peripheral and placental parasitemia and provide intermittent chemoprophylaxis against malaria infection in pregnancy.[9,10] IPTp with sulfadoxine-pyrimethamine avoids the challenges of daily and weekly dosing, has the advantage of compliance and takes advantage of the antenatal clinic visits for drug administration by a directly observed therapy.[7,11] The treatment of only clinical infections will result in missing most asymptomatic infections. Many trials have shown the advantage of malaria chemoprophylaxis in pregnant women which include a reduction in placental parasitemia, lower proportion of low-birth weight neonates, and a reduction in frequency of anemia among women who had IPTp.[12-14]

IPTp-SP was adopted in many African countries due to its ease of administration. However, its implementation and effectiveness have been limited by the nonattendance of ANC by some women, late booking, noncompliance, cost, and resistant strains of the parasite.[15-17] Some studies have demonstrated increasing resistance of Plasmodium falciparum to anti-malarial agents including Suphadoxine-pyrimethamine combination.[5,16,18,19] Therefore, the advantages conferred by these agents may be threatened by the spreading Plasmodium falciparum resistance.[16,18,20-22] Consequently, pregnant women despite compliance with IPTp use may still have cases of acute malaria. This study is therefore pertinent, as it not only assessed the uptake of IPT in the index pregnancy but also correlates the occurrence of malaria with use and non-use of IPT-SP.

Patients, Materials and Methods

Study location

The study was conducted in the University College Hospital (UCH), Ibadan, and South-western Nigeria. The facility is a tertiary health care center situated in Ibadan at the heart of Oyo state. It attends to parturient including junior and senior civil servants and other members of the populace; the services are provided by midwives, interns, residents, and consultants. Participants were women who delivered in UCH and presented for postnatal clinic visits during the study period from October 1, 2020 to December 31, 2020.

Study method

The study was a cross-sectional study among eligible parturients attending the 6th week postnatal clinic visit at the Obstetrics and Gynecology Department of UCH. Information about the study was provided to postpartum women at the postnatal clinic, they were screened for eligibility using the study criteria, and informed consent was obtained prior to administration of the study questionnaire.

Study criteria

Inclusion criteria

was all consenting postpartum women who presented to the postpartum clinic during the study period.

Exclusion criteria

were postpartum women with homozygous hemoglobin S on proguanil, postpartum women with Human Immunodeficiency Viral infection on trimethoprim-sulphamethoxazole, and non-consenting women.

Sample size calculation

A sample size of 150 participants were expected for enrolment based on a calculated minimum sample size of 136 obtained using the sample size formula for a single population and 10% non response rate. This minimum sample calculation was estimated using an expected IPT uptake prevalence of 90.3%.[5] This sample size had a margin of error of 5% and a confidence interval of 95%. This was calculated using the formula:

$$n = \frac{Z^2 P(1-P)}{D^2}$$

$$\frac{1.96^2 \times 0.903(0.097)}{0.052}$$

$n = 135.6$

Where: n = The minimum required sample size.

Z = Standard normal deviation corresponding to 95% confidence interval, which equals to 1.96.

P = Proportion of pregnant women who had IPT in index pregnancy taken to be 90.3%.

D = The margin of error on P is estimated to be at 5%.

Therefore: n = 136. Adjusting for 10% of the nonresponse rate, a total of 150 participants was required for the study.

Study instrument

Structured Questionnaires (in English) with translated version in Yoruba (being the spoken indigenous language at the study location) were administered by the researcher to each participant. Information obtained includes sociodemographic characteristics, history of index pregnancy, knowledge of preventive measures for malaria in pregnancy, assessment of

IPT-SP uptake in index pregnancy, and prevalence of clinical malaria. IPT-SP was defined in the study as the use of three tablets of Sulfadoxine-Pyrimethamine (SP) combination for malaria prophylaxis in second and third trimester. IPT-SP use was elicited using the common proprietary names (Fansidar, Laridox, Amalar, Maloxine) available in our environment as well as the dosing, that is, a drug comprising three tablets swallowed at once for malaria prevention. Furthermore, women with poor recall of information about the number of doses taken in pregnancy had the information checked from the documentation in the case files.

Data analysis

Data from this study were entered and analyzed using Statistical Package for the Social Sciences version 21.0 software (SPSS Inc., Chicago, IL, United States). Tables, graphs, and charts were generated to summarize the results.

Ethical consideration

Ethical approval was obtained from the University of Ibadan/UCH Ethical Review Committee and the ethical principles of confidentiality, beneficence, and nonmalevolence were upheld during the study.

Results

The sociodemographic characteristics of the postpartum women who participated in the study are presented in Table 1 below. The average age of the women was 31.8 ± 4.8 years with about a quarter in each of the age group 25–29 years and 35–39 years (24.7% each), and more than one-third in the age range 30–34 years (39.3%). The women were predominantly (98.7%) married. More than half of the women were self-employed (56.7%), about one-third were civil servants (32.0%), and a few were students (2.7%) or unemployed (8.7%). The monthly income estimate, among the 133 women who were working, showed that about 80.5% earned above 18,000 naira, and 19.5% earned 18,000 naira or less. About nine out of ten (90.0%) of the women attained a tertiary level of education. The majority of the participants were Christian (74.0%), while the remaining were Muslims (26.0%). More than three-quarter (81.3%) of the participants were Yoruba by ethnicity, the Igbos made up 8.0%, while Hausa and other ethnic groups made up 10.7% of the participants.

The obstetric information of the women who participated was also presented in Table 1. Almost one-third never had a previous pregnancy (30.7%) with most of them have had 1–2 previous pregnancies (44.0%), about a quarter previously had 3–4 pregnancies (23.3%), and about 2.0% had 5 or more previous pregnancies.

Table 1: Sociodemographic characteristics of participants

	Frequency (n=150), n (%)
Age (years)	31.8±4.8
≤24	10 (6.7)
25-29	37 (24.7)
30-34	59 (39.3)
35-39	37 (24.7)
≥40	7 (4.7)
Marital status	
Married	148 (98.7)
Single	2 (1.3)
Occupation	
Student	4 (2.7)
Civil servant	48 (32.0)
Unemployed	13 (8.7)
Self-employed	85 (56.7)
Monthly income (n=133)*	
Below or equal to 18,000 naira	26 (19.5)
Above 18,000 naira	107 (80.5)
Level of education	
Primary	2 (1.3)
Secondary	13 (8.7)
Higher/tertiary	135 (90.0)
Religion	
Christianity	111 (74.0)
Islam	39 (26.0)
Ethnic group	
Yoruba	122 (81.3)
Igbo	12 (8.0)
Others (including Hausa)	16 (10.7)
Number of previous pregnancies	
None	46 (30.7)
1-2	66 (44.0)
3-4	35 (23.3)
≥5	3 (2.0)
Number of babies alive	
None	48 (32.0)
1-2	69 (46.0)
3-4	33 (22.0)

*Students and unemployed respondents excluded

History of index pregnancy

Information on the index pregnancy obtained from the women is presented in Table 2. Most of the women booked their index pregnancy at UCH (82.7%), others (17.3%) booked their pregnancy in facilities such as mission home, primary health center, general hospital, and private hospital. About one-third (33.3%) booked their index pregnancies within the first trimester, 57.3% in second trimester, and 9.3% in third trimester. Very few of the participants attended no ANC (2.0%), the greatest proportion of participants (77.3%) had between one and seven antenatal clinic visits while just about one-fifth of participants (20.3%) had at least eight antenatal clinic visits.

Knowledge on preventive measures for malaria in pregnancy

The participants' knowledge on preventive and control measures for malaria that can be taken during pregnancy was also assessed. Common measures correctly identified among the women were – environmental sanitation (94.0%), use of antimalarial drugs (92.7%), insecticide-treated bed nets (89.3%), use of insecticides (86.7%), treatment of

Table 2: Information on index pregnancy

	Frequency (*n*=150), *n* (%)
Where did you book?	
Mission home	2 (1.3)
PHC	4 (2.7)
General hospital	13 (8.7)
Private hospital	7 (4.7)
UCH	124 (82.7)
Booking period	
First trimester	50 (33.3)
Second trimester	86 (57.3)
Third trimester	14 (9.3)
Number of ANC attendance	
None	3 (2.0)
1-7	116 (77.3)
≥8	31 (20.7)

UCH: University College Hospital, ANC: Antenatal care, PHC: Primary healthcare centre

Table 3: Information on uptake of intermittent preventive therapy for malaria

	Frequency (*n*=150), *n* (%)
Heard about IPT for malaria in pregnancy	
Yes	133 (88.7)
No	17 (11.3)
Drugs used for IPT for malaria	
Correct	
Fansidar/maloxine/amalar	118 (78.7)
Incorrect/don't know	
Folic acid	10 (6.7)
Fersolate	16 (10.7)
Vitamin C	1 (0.7)
Don't know	5 (3.3)
Uptake of IPTp drug in index pregnancy	
Yes	130 (86.7)
No	20 (13.3)
Number of times of IPTp drug use (*n*=130)	
One	20 (15.4)
Two	66 (50.8)
Three	37 (28.5)
Four	5 (3.8)
Five	2 (1.5)
Person responsible for cost of IPTp drug (*n*=130)	
Myself	54 (41.5)
My husband	75 (57.7)
My parent	1 (0.8)
Reasons for not using IPTp drug (*n*=20; multiple response)	
I react to it	15 (75.0)
It will affect my pregnancy	4 (20.0)
I could not afford it	1 (5.0)

IPT: Intermittent preventive therapy

cases of malaria (80.0%), and treatment of complication of malaria (70.0%). On an overall assessment scale, up to 89% generally had a good knowledge on the preventive measures for malaria [Figure 1]. This was done by using the above six variables to determine the knowledge of participants as displayed in Figure 1. The responses of the participants were adjudged to be either right or wrong (those who picked 'I don't know' were classified as wrong). Each rightly answered prompt attracted one point. There were six prompts; the participants who got 4 or more right were adjudged to have good knowledge; the reverse was true for those participants with poor awareness.

Uptake of intermittent preventive therapy for malaria in pregnancy

As shown in Table 3, more than three-quarters of participants were aware of intermittent preventive therapy for malaria (88.7%). The most common source of information about IPT among the women was through doctors (52.3%), nurses (40.0%), media (3.1%), pharmacists (3.1%), fellow pregnant women (0.8%), and friends (0.8%).

A significant proportion of the women (78.7%) correctly identified the drugs used for malaria IPTp. Others wrongly indicated drugs such as folic acid, fersolate, and Vitamin C as malaria IPT drugs. Eighty-seven percent of the participants reported that they took IPTp in the course of the index pregnancy with about half of them taking two doses during the index pregnancy (44.0%), approximately one-third had 3 or more doses (29.3%), 13.4% had just one dose. More than half (57.7%), of those who reported taking the preventive drug, indicated their husbands were responsible for the cost while 41.5% indicated they were responsible for the cost themselves.

Common reasons for not taking the malaria preventive drug were adverse reactions to the medication (75.0%), belief that it will affect the pregnancy (20.0%), and inability to afford the drug (5.0%).

Incidence of clinical malaria

As shown in Table 4, the study also showed the prevalence of clinically diagnosed malaria during the index pregnancy. Forty-eight percent of the participants stated that they received malaria treatment in the course of their index pregnancy. Exactly half of those who received the malaria treatment had just one treatment (50.0%) while the other half was treated for malaria multiple times (50.0%). A majority (86.1%) had tested positive for malaria prior to their treatments while Some (13.9%) of the participants who were treated for malaria did not test positive prior to their treatment;. Drugs reported to have been received as malaria treatment were – Sulfadoxine + Pyrimethamine (41.7%), Artemether + lumefantrine (37.5%), and Amodiaquine (2.8%).

A few of the participants treated for malaria (19.4%) reported they never completed each treatment of their malaria drug dosage. About 42.9% of the 14 participants who took incomplete dosage of the malaria treatment drugs had one episode of incomplete treatment. The others (57.1%) had not completed their dosages for multiple times. Only 11 participants (15.3%) of the 72 participants who received malaria treatment were admitted to the hospital during the

index pregnancy with 8 participants (72.7%) reporting admission to the hospital for just once, 3 participants (27.3%) reported been admitted more than once due to malaria.

Factors associated with intermittent preventive treatment uptake during index pregnancy

Factors evaluated to have been significantly associated with IPT use were occupation of the women (P = 0.001), booking facility (P = 0.002), number of ANC attendance (P = 0.001), and awareness about IPT for malaria (P = 0.002).

It was shown that women who were self-employed were more likely to take IPT. Also, participants who booked their pregnancies in UCH, Ibadan were more likely to use IPT, as well as those who had higher number of ANC visits.

The distribution of the IPT uptake of participants by their booking facility is shown in Figure 2.

Factors associated with incidence of malaria during index pregnancy

IPT uptake (P = 0.034), number of doses of IPT taken (P = 0.038), and monthly income (P = 0.049) were significantly associated with prevalence of malaria in pregnancy. This revealed that participants who take IPT were less likely to have malaria in pregnancy. Moreso, the higher the number of IPT taken the lesser the likelihood of malaria in pregnancy as illustrated in Table 5. Furthermore, women who earn more than the minimum wage were less likely to have malaria in pregnancy.

Figure 3 displays the percentage of women who were admitted for malaria, as well as their malarial treatment drug dosage compliance. Up to 91.0% of those who were treated for malaria in pregnancy completed their drugs dosage and were not admitted during the index pregnancy. Meanwhile, of the approximately one-tenth of participants that were treated for malaria, 22.2% of them did not complete doses at some or all treatment for malaria and reported admission into the hospital due to malaria in pregnancy.

Discussion

The modal age range from this study was 30–34 years which constituted more than one-third of the study participants, this is similar to findings in other studies.[2,5,6,23] Most of the respondents were noted to be self-employed and at least 80% of them earn above the minimum wage in Nigeria as at the time of this study. About 90% of them had tertiary level of education which is typical of the pattern in the urban environment as seen in similar studies.[2,11] although, another study conducted in Ibadan at a secondary health care facility reported that most of the participants had secondary education.[23] This may be due to the location of the study facility in the high-brow area of the city with a high population of civil servants. In addition, most of the respondents in this study were multiparous, this was similar to findings by Ibrahim H and *et al.* and Anto F *et al.* in Ghana.[11,21] This may be due to the nature of cases commonly managed in the study institution being a tertiary

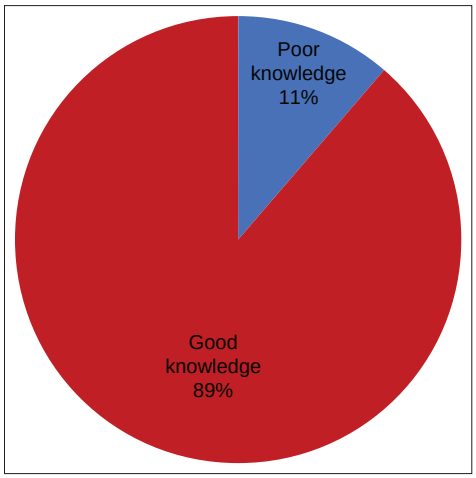

Figure 1 [original]: Knowledge on preventive measures for malaria

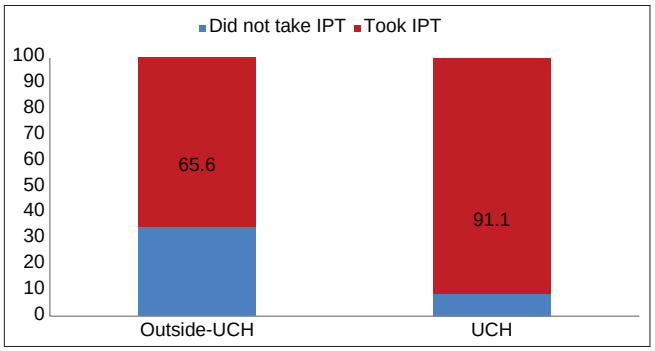

Figure 2 [original]: Intermittent preventive treatment IPT uptake by booking status

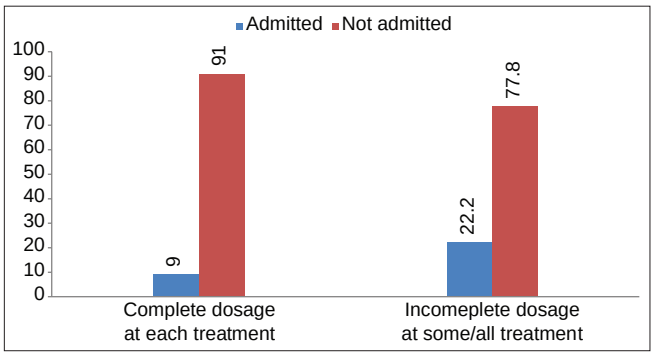

Figure 3 [original]: Admitted for Malaria during index pregnancy

health care center, as was obtainable from studies with similar statistics.[21,23] In contrast to studies in Ilorin, Abuja, and Calabar where primigravidae were more.[2,5,6]

Almost all respondents had ANC in these index pregnancies with most of them noted to have booked at the study site. Only about one-third of the participants had the first antenatal visit in first trimester, which is consistent with findings from other studies done in the country.[2,5,21] The findings are much lower than reported in other African countries like Ghana, South Africa, Cameroon, and the Democratic republic of Congo.[10,24-26] Late booking has been attributed to factors such

Table 4: Information on prevalence of clinical malaria

	Frequency (*n*=150), *n* (%)
Received malaria treatment in index pregnancy	
Yes	72 (48.0)
No	78 (52.0)
Number of times received treatment (*n*=72)	
One	36 (50.0)
Two	19 (26.4)
Three	15 (20.8)
Four	1 (1.4)
Five	1 (1.4)
Number of times tested positive before treatment (*n*=72)	
None	10 (13.9)
One	40 (55.6)
Two	17 (23.6)
Three	5 (6.9)
Drugs received as malaria treatment (*n*=72; multiple response)	
Fansidar	30 (41.7)
Lonart	14 (19.4)
Coartem	13 (18.1)
Camoquine	2 (2.8)
Drug dosage completion at each treatment (*n*=72)	
Yes	58 (80.6)
No	14 (19.4)
Number of times of incomplete drug dosage (*n*=18)	
One	6 (42.9)
Two	6 (42.9)
Three	1 (7.1)
Four	1 (7.1)
Admitted in the hospital due to malaria (*n*=72)	
Yes	11 (15.3)
No	61 (84.7)
Number of times of hospital admission (*n*=11)	
One	8 (72.7)
Two	2 (18.2)
Three	1 (9.1)

as financial status, planning for the particular pregnancy, level of education of the woman, and distance from the hospital.[24-27]

About one-fifth of the respondents had at least eight antenatal clinic visits in the index pregnancy, which is the current WHO recommendation for ANC.[28] The findings from this study was significantly lower than report given by Anto F *et al.* and Pugliese-Garcia *et al*., where about 36.6% and 60.0% of their participants had at least eight visits respectively.[21,29] The finding by Adeniran *et al*. from Ilorin was lower than reported in the present study.[5]

The uptake of IPT from this study was good, although less than one-third of respondents took adequate doses as per the current recommendation by WHO which has also been adopted by our national guideline on prevention of malaria in pregnancy.[7,8] This calls for more enlightenment and education on the importance of IPT to facilitate better compliance with the current trend for malaria prevention in pregnancy.

The mostcommon reason for not using IPT-SP in pregnancy by respondents was prior adverse reaction to the drug, the complaint that is commonly associated with the sulphonamides component of the SP formulation.[16] Although similar study done in Ilorin revealed fear of teratogenicity as the most prominent factor.[5]

The use of IPT-SP was significantly related to the occupation of the women. The self-employed respondents were more likely to use the drug which is a result of their higher odds to attend antenatal clinic compared to the other categories of respondents. Those who booked their pregnancy in UCH were significantly more likely to have used IPT-SP. This may be due to a recent unpublished study in UCH where women were given the drug free of charge and had directly observed therapy. Also, respondents who had good level of awareness about IPT-SP were significantly more likely to use it. These were similar to findings by previous studies.[11,30] Other factors such as level of education and parity did not significantly affect the use of IPT-SP in this study. However, findings from a study done by Ibrahim *et al*. reported a significant association of level of education with IPT-SP uptake.[11] Likewise, parity had a significant association with IPT-SP use as reported by Amoran *et al*.[30]

The incidence of clinical malaria was fairly high in this study as almost half of the participants indicated that they had malaria treatment in the index pregnancy. About half of the respondents who had malaria indicated they only had one episode of infection with about 90% of them testing positive for malaria during each episode. Testing for the presence of malaria parasite before treatment is one of the key recommendations by the WHO in the prevention and treatment of malaria in pregnancy.[4] Also, more than one-third of the respondents who had malaria treatment revealed that they were given Fansidar®, a form of SP. This signifies one of the limitations of this study as some participants had poor recall and mistook chemoprophylaxis for malaria treatment. This also calls for proper patient enlightenment about their care. Meanwhile, less than a fifth of the respondents who had IPT-SP and were treated for malaria got admitted into the hospital. This may imply that the uptake of IPT-SP reduces the risk for severe malaria in pregnancy.

The significant factors associated with the prevalence of malaria in pregnancy were the IPT uptake and the number of IPT-SP doses taken by respondents. Those who had IPT had lower odds for malaria in pregnancy in contrast to those who did not take IPT-SP in pregnancy. Also, it was shown that the prevalence of malaria reduced as the number of doses of IPT-SP increased. These findings suggest that IPT-SP remains effective as chemoprophylaxis against malaria in pregnancy as affirmed by similar studies.[21,23]

Table 5: Factors associated with malaria treatment during index pregnancy

	Treated for malaria, *n* (%)	Not treated for malaria, *n* (%)	χ^2	*P*
Age (years)				
≤24	5 (50.0)	5 (50.0)	1.55	0.818
25-29	20 (54.1)	17 (45.9)		
30-34	25 (42.4)	34 (57.6)		
35-39	18 (48.6)	19 (51.4)		
≥40	4 (57.1)	3 (42.9)		
Marital status				
Married	71 (48.0)	77 (52.0)	0.003	1.00[Fi]
Unmarried	1 (50.0)	1 (50.0)		
Occupation				
Unemployed/student	8 (47.1)	9 (52.9)	2.20	0.333
Employee (government/private)	19 (39.6)	29 (60.4)		
Self-employed	45 (52.9)	40 (47.1)		
Level of education				
Primary	1 (50.0)	1 (50.0)	2.58	0.275
Secondary	9 (69.2)	4 (30.8)		
Higher/tertiary	62 (45.9)	73 (54.1)		
Ethnicity				
Yoruba	60 (49.2)	62 (50.8)	0.37	0.546
NonYoruba (Igbo, Hausa, others)	12 (42.9)	16 (57.1)		
Monthly income (*n*=133)*				
Below or equal to 18,000 naira	17 (65.4)	9 (34.6)	3.49	0.049
Above 18,000 naira	47 (43.9)	60 (56.1)		

*Relevance as regards treatment of malaria is with respect to the likelihood of respondents to procure IPT medication and ratio of those who developed malaria as a significant proportion of participants were responsible for the cost of medications themselves.

The average birth weight of women who took IPT-SP was slightly higher than that of those who did not take it. This was not statistically significant in contrast to findings from some other studies where those women who took IPT had a significantly higher birth weight than that of those who did not take.[16,22,23,31-33] Although the current study might not be powered to detect a statistically significant difference. However, the findings by some other studies revealed similar report as the present study.[34,35]

Conclusion

The uptake of the current recommendation for IPT-SP was quite poor among the respondents as a result of poor awareness, late booking, poor socioeconomic status of the women and the quality of ANC received. There is an urgent need for widespread awareness and implementation of the current recommendation by WHO and the national guideline on prevention of malaria with emphasis on early antenatal booking, detailed health education during antenatal follow-up, and directly observed therapy of the current recommendation for IPT-SP. The prevalence of malaria declined with the number of doses of IPT-SP respondents, which emphasizes the need for adequate dosing of IPT to prevent the fetomaternal complications of malaria in pregnancy.

Acknowledgment

Our sincere appreciation goes to Drs Adesina OA and Adeyanju SA, for there intelligent inputs in terms of provision of materials for this work.

Financial support and sponsorship

Self-sponsored.

Conflicts of interest

There are no conflicts of interest.

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