

## Utilization of Intermittent Preventive Treatment of Malaria by Pregnant Women in Rivers State, Nigeria

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### ABSTRACT

**Background:** This study was conducted to assess the level of intermittent preventive treatment of malaria in pregnancy (IPTp) in Rivers State, Nigeria, to identify obstacles prohibiting utilization in order to make recommendations for improved uptake and malaria control in general.

**Methods:** A cross-sectional study was carried out in November 2008 among 339 pregnant women and those who had delivered children in the last 1 year, using a multistage sampling method. Data were analyzed using the Epi-Info version 6.04d statistical software package and hypothesis tests were conducted to compare summary statistics at 95% significance level.

**Results:** Most of the respondents (76.4%) had knowledge that malaria was caused by mosquitoes and was harmful in pregnancy. Although majority of the pregnant women (80.8%) attended antenatal care clinics, knowledge of the correct use of SP was low (32.6%) and only 62.8% took malaria preventive treatment. Of these, 58.4% took SP, while nearly a third, 31.8%, took chloroquine. Only 16.4% took their SP at the health facility directly observed by health workers according to the national guidelines. The commonest reason for not preventing malaria was that they were not sick during the period of pregnancy.

**Conclusions:** Misconceptions about IPTp persist among women known to have attended antenatal care clinics, resulting in only a minority of pregnant women receiving IPTp as recommended by national guidelines. Efforts directed at awareness creation on the new malaria prevention and treatment policy are therefore necessary to enhance the uptake of IPT in pregnancy in Rivers State. Further studies are however, needed to evaluate the knowledge and practices of health care workers on the new malaria treatment policy.

**Keywords:** Intermittent preventive treatment, malaria in pregnancy, Nigeria

## INTRODUCTION

Malaria is a threat both to pregnant women and their babies, with about 200,000 newborn deaths each year as a result of malaria in pregnancy.<sup>[1,2]</sup> In Sub-Saharan Africa, about 25 million pregnant women are at risk of malaria annually, and one in every four women has evidence of placental infection at the time of delivery.<sup>[2]</sup> In Nigeria, malaria is one of the leading causes of morbidity and mortality and accounts for more than 50% of all cases seen in the hospitals.<sup>[3,4]</sup> Pregnant women are particularly vulnerable to malaria as pregnancy reduces a woman's immunity to malaria, increasing her risk of illness, severe anemia, and death, while the risk of spontaneous abortion, stillbirth, premature delivery, and low birth weight increases for the fetus.<sup>[1,2]</sup>

Intermittent preventive treatment with an antimalarial drug during pregnancy such as sulphadoxine-pyrimethamine (SP) is a cost-effective means of preventing malaria in pregnancy. Several studies have demonstrated its efficacy in causing a decline in placental infection, anemia, and low birth weight babies,<sup>[2,5]</sup> despite reports of increasing resistance to it in some African countries.<sup>[6,7]</sup> The Federal Ministry of Health in Nigeria in its National Strategic Plan for the control of malaria in 2001 recommended early case management, two doses of SP during the second trimester and early in the third trimester of pregnancy against the adverse consequences of malaria in pregnancy. A third dose is recommended for pregnant women who are HIV positive.<sup>[3]</sup> This recommendation was a shift in treatment policy from the use of chloroquine for the treatment of uncomplicated malaria as result of the high level of resistance of *Plasmodium falciparum* to chloroquine, as demonstrated by several drug efficacy studies carried out in many African and Asian countries.<sup>[8,9]</sup> In accordance with the current national guidelines, SP is given free of charge to pregnant women attending antenatal care clinics services in public health facilities and nongovernmental organizations (NGO/faith-based facilities, using the strategy of directly observed therapy (DOT). However, a decade after the policy recommendation, studies in many parts of Nigeria still indicate low coverage of intermittent preventive treatment of malaria in pregnancy (IPTp) use during pregnancy,<sup>[10]</sup> unlike a more impressive utilization observed in Malawi

and Tanzania.<sup>[11,12]</sup> There is little information on the extent of IPTp in Rivers State in compliance with national policy recommendations, especially as efforts are accelerated toward the attainment of malaria related millennium development goals in the State. We therefore conducted this study to determine the level of IPTp and to identify obstacles prohibiting its widespread use. Information obtained from this study will be useful in guiding state and national policies toward improved IPTp uptake and malaria control in general.

## METHODS

The study was carried out in Rivers State, Nigeria. Rivers State is located in the heart of the Niger Delta region southern Nigeria. The area is predominantly a wetland area characterized by dense rain forest zones and large expanse of fresh and brackish water swamps. It rains all year round with an annual average of about 1500 mm, moderate temperatures usually not exceeding 36°C, and high humidity which is usually between 60% and 80%.<sup>[13]</sup> The State has a population of 5.6 million people. It is made up of 23 local government administrative areas (LGAs) embedded in 3 senatorial districts. Each senatorial district is therefore made up of 7–8 LGAs. There are over 1583 communities in the state of diverse ethnic groups, prominent among which are the Kalabaris, Ikwerres, Ogonis, Ekpeyes, Ogbas, Engenes, Ibanis, and Okrikas. The people are predominantly engaged in fishing, farming, and petty trading.

Primary health care services are available in many rural communities, while secondary and tertiary health services are located in the local government headquarters and cities. Many more of the rural dwellers however depend on patent medicine vendors, traditional birth attendants, herbal medicine practitioners, and spiritual healers for medical care. Patent medicine vendors are said to be the foremost among these informal sector health care providers and antimalaria drugs rank high among the drugs administered by these medicine sellers in Nigeria.<sup>[14-16]</sup> Many locals perceive them to be well knowledgeable on health matters and can be relied on or trusted. Studies carried out in three of the six geographical zones of Nigeria revealed that 39% of sick persons patronized patent medicine vendors, 25% reported self-treatment in many cases with drugs purchased

from drug vendors, and 72% still used chloroquine for the treatment of malaria.<sup>[17]</sup>

## DESIGN AND SAMPLING

A cross-sectional study was carried out in the State in November 2008 among 399 pregnant women and those who had delivered children in the past 1 year. The minimal sample size the study was estimated using the formula for descriptive studies,<sup>[18]</sup> prevalence of IPTp with SP in Nigeria of 12%,<sup>[19]</sup> error margin of 5% with adjustments made for a Design Effect (DEFT) = 2.

The study was conducted in three Local Government Areas (LGAs) of the State out of a total of 23 LGAs. The selected LGAs were Akuku-Toru, Andoni, and Etche. The subjects were selected by a multistage sampling method; the first stage being by listing of the LGAs in each of the three senatorial districts (consisting of 7–8 LGAs) and selecting one local government area (LGA) by a simple random method; the second stage was the selection of communities in a selected LGA. This was also done by listing the communities in the LGA and selecting one also by simple random sampling, while the third and final stage was the selection of households within each community from a generated list of households in the communities. This was done by stratified sampling proportionate to population size of the community. A total of 100–150 households per community were selected for the study. The first house and household included in the study was determined by spinning a pen from a central location in the community and following the direction to reach an eligible respondent. Subsequent respondents were the next consecutive eligible respondents until the sample size was attained.

Interviews were conducted by previously trained primary health care workers recruited from the local government headquarters. They utilized a questionnaire adapted from the WHO/Federal Ministry of Health on malaria baseline information in the local languages when it was necessary, to ensure that the respondents understood the questions and responded appropriately. Section one of the questionnaire contained information on demographic attributes of respondents, section two contained knowledge of malaria in pregnancy, and section three contained information on the

practice of malaria prevention in pregnancy. Data were analyzed using the Epi-Info version 6.04d statistical software package and hypothesis tests were conducted to compare summary statistics at 95% significance level. Verbal consent of all pregnant women participating in the study was obtained after full explanation of the purpose of the study and that participation was voluntary, without any obligations or sanctions.

## RESULTS

### Demographic characteristics of respondents

A total of 339 pregnant women or women who had children in the last 1 year were interviewed. Majority of the women (31.6%) were aged between 25 and 29 years (mean age  $28.2 \pm 3.13$  years) and had primary level education, although 8% had no formal education. Fishing, farming, and petty trading were the most common occupations among them [Table 1].

### Knowledge of malaria among respondents

More than three quarters (76.4%) of the women had correct knowledge that malaria was caused by exposure to mosquito bites. There were however some respondents with misconceptions that malaria resulted from working in the sun (11.5%), eating too much of palm oil (4.7%) and witchcraft (1.5%). Most of the women (71.4%) equally had knowledge that malaria could cause some harm during pregnancy to the mother or fetus such as abortion, still births, or low birth weight. However, nearly a third of the women (32.6%) did not know the correct dose of SP recommended for preventing malaria in pregnancy [Table 2].

### Practice of malaria prevention in pregnancy

A majority of the respondents, (80.8%) currently attend or attended antenatal care clinics during their last pregnancy, while the rest (19.2%) did not. The main reasons for not attending were given as the low perception of personal risk (73.8%), unavailability of the antenatal care service in their locality (10.8%), and the fear that medication from the health facilities could harm their unborn babies (9.2%). For those that made use of antenatal services, majority (66.8%) registered in the second trimester of pregnancy, while 28.8% registered earlier, in the first trimester. It was however found that only 62.8%

**Table 1:** Demographic characteristics of respondents

Variable	Frequency <i>n</i> = 339	Percentage (%)	95%CI
<b>Age</b>			
15–19 years	30	8.8	6.05–12.39
20–24 years	76	22.4	18.09–27.24
25–29 years	107	31.6	26.65–36.80
30–34 years	69	20.4	16.20–25.04
35–39 years	34	10.0	7.05–13.73
40–44 years	15	4.4	2.50–7.19
45–49 years	8	2.4	1.02–4.60
<b>Educational level</b>			
Nonformal education	27	8.0	5.31–11.38
Primary education (6 years of schooling)	90	26.5	21.92–31.60
Secondary education (11 years of schooling)	171	50.4	44.99–55.89
Post secondary education (beyond secondary)	51	15.1	11.41–19.30
<b>Occupation</b>			
Unemployed	77	22.7	18.36–27.55
Petty trading	64	18.9	14.85–23.46
Farming/fishing	155	45.7	40.33–51.19
Skilled workers	28	8.3	5.56–11.72
Civil servants	15	4.4	2.50–7.19
<b>Religion</b>			
Christian	268	79.1	74.33–83.26
Moslems	28	8.3	5.56–11.72
Traditional worshipers	43	12.7	9.33–16.70
<b>Duration of pregnancy</b>			
0–3 months	73	21.5	17.28–26.29
4–6 months	158	46.6	41.20–52.07
7–9 months	108	31.9	26.93–37.11

of those who attended the antenatal clinics (ANC) took intermittent preventive treatment for malaria, while the rest (37.2%) said they did not. The most common reason (76.5%) given by respondents for not taking intermittent preventive treatment of malaria was that they were not sick during pregnancy and saw no reason why they should take the drugs. A few (13.7%) however, said they either did not believe in the efficacy of the drugs or that they were afraid the drugs could cause loss of pregnancy. For the 274 who were on intermittent preventive treatment of malaria, the commonest drugs used were SP (58.4%), while as much as a third, 87 (31.8%) used chloroquine that has been replaced by recent government policy in view of the widespread resistance to it in Nigeria. About 43.6% of those on SP had received a first dose, while 46.5% had received a second dose. Of these, only 16.4% took the drug at the health facility directly observed as against 71.4% who said they took theirs at home [Table 3].

## DISCUSSION

This study shows that most of the women interviewed were aware that exposure to mosquito bites predisposes them to malaria and that malaria could be harmful during pregnancy to the mother and the unborn baby. The apparent knowledge about malaria among our respondents may be linked to the appreciable level of education among them and the fact that they reside in a malaria endemic region. The association between women's education and knowledge about malaria has been widely reported in Nigeria<sup>[20,21]</sup> and elsewhere in Africa.<sup>[22,23]</sup> However, the knowledge exhibited by the women was at variance with their practices. A large proportion of women, who attended ANC, collected SP from health workers, took them home but did not use the drugs eventually. This was because most of the women felt they were not sick during pregnancy or had fears that taking the drugs

**Table 2:** Knowledge of malaria among respondents

Variable	Frequency <i>n</i> = 339	Percentage (%)	95%CI
Knowledge of causes of malaria			
Working hard under the sun	39	11.5	8.31–15.39
Eating palm oil	16	4.7	2.72–7.55
Witchcraft	5	1.5	0.48–3.41
Mosquito	259	76.4	71.51–80.82
Others	3	0.9	0.18–2.56
Don't know	17	5.0	2.95–7.90
Knowledge of harmfulness of malaria during pregnancy			
Yes	242	71.4	66.26–76.14
No	41	12.1	8.82–16.05
Don't know	56	16.5	12.73–20.91
Knowledge of the types of harm caused by malaria in pregnancy			
Abortion	94	27.7	23.02–32.82
Still birth	62	18.3	14.32–22.82
Low birth weight	57	16.8	12.99–21.23
Bleeding during pregnancy	12	3.5	1.84–6.10
Bleeding after pregnancy	3	0.9	0.18–2.56
Others	14	4.1	2.28–6.83
Don't know	97	28.6	23.86–33.74
Knowledge of preventative treatment against malaria during pregnancy			
Yes	144	42.5	37.15–47.93
No	195	57.5	52.07–62.85
Sources of information about drugs to prevent malaria in pregnancy, <i>n</i> = 144			
Health facility	92	63.9	55.74–71.72
Radio/TV	16	11.1	6.49–17.42
Newspaper/magazines	4	2.8	0.76–6.96
Family	12	8.3	4.38–14.10
Friends/Neighbors	17	11.8	7.03–18.23
Others	3	2.1	0.43–5.97
Knowledge of doses of SP for preventing malaria in pregnancy, <i>n</i> = 144			
One dose	8	5.6	2.43–10.65
Two dose	71	49.3	40.88–57.76
Three dose	18	12.5	7.58–19.03
Don't know	47	32.6	25.07–40.61

could cause harm to their unborn babies or even doubted the efficacy of the drugs in preventing malaria during pregnancy. The reluctance in taking medications especially when there was no clear indication or apparent need corroborate the general feeling in the society that medicines are unnecessarily harmful when healthy and therefore should be taken only when there is a compelling need to do so.<sup>[24]</sup>

There are reports that pregnant women are associating SP with severe adverse outcomes such as abortion and skin reactions, which could account for why some do not take the drugs.<sup>[25-27]</sup>

Equally of great concern was the fact that nearly a third of the women continued to use chloroquine for the prevention of malaria in pregnancy in despite the shift in National Malaria Treatment policy recommending the use of SP in preventing malaria in pregnancy. The noncompliance with the new policy puts pregnant women at risk of malaria in pregnancy with the unpleasant consequences on maternal health and pregnancy outcomes such as anemia, spontaneous abortion, low birth weight, prematurity, or even death.<sup>[28,29]</sup>

These negative attitudes of women are relevant issues for intervention by ANC providers through

**Table 3:** Practice of malaria prevention during pregnancy

Variable	Frequency	Percentage (%)	95%CI
Attendance of ANC, <i>n</i> = 339			
Yes	274	80.8	76.23–84.88
No	65	19.2	15.12–23.77
Reasons for not attending ANC, <i>n</i> = 65			
Not at risk during pregnancy	48	73.8	61.46–83.97
Unavailability of health facility	7	10.8	4.44–20.94
Fear of loss of pregnancy	6	9.2	3.46–19.02
No reason given	4	6.2	0.37–10.68
Time of commencement of ANC visits, <i>n</i> = 274			
1–3 months of pregnancy	79	28.8	23.54–34.59
4–6 months of pregnancy	183	66.8	60.87–72.34
7–9 months of pregnancy	12	4.4	2.28–7.53
Current status of Intermittent preventive treatment in pregnancy, <i>n</i> = 274			
Yes	172	62.8	56.75–68.51
No	102	37.2	31.49–43.25
Drugs being used to prevent malaria in index pregnancy, <i>n</i> = 274			
Chloroquine	87	31.8	26.28–37.62
Sulphadoxine/pyrimethamine (SP)	160	58.4	52.31–64.29
Amodiaquine	1	0.4	0.00–2.02
ACTs	5	1.8	0.59–4.21
Others	1	0.4	0.00–2.02
Don't know	20	7.3	4.52–11.05
Doses of sulphadoxine-pyrimethamine taken in index pregnancy, <i>n</i> = 172			
One dose	75	43.6	36.4–50.5
Two dose	80	46.5	39.04–53.96
Three dose	11	6.4	2.74–10.06
Don't know	6	3.5	0.74–6.23
Reasons for not taking antimalaria drugs in this pregnancy, <i>n</i> = 102			
Not sick during pregnancy	78	76.5	68.29–84.71
Do not believe in its efficacy	14	13.7	7.05–20.41
Fear of loss of pregnancy	8	7.8	2.63–13.05
Others	2	2.0	-0.73–4.65
Place of swallow of SP, <i>n</i> = 274			
During ANC visit	45	16.4	12.03–20.81
Other health visits	3	1.1	-0.14–2.33
At home	226	82.5	77.98–86.98

targeted malaria prevention information. However, studies by WHO have revealed that ANC services provided in Africa and other developing countries are often substandard and have therefore significantly contributed to lower uptake of relevant preventive health interventions.<sup>[25,30,31]</sup> In addition to risk detection, one of the objectives of antenatal care service is to provide pertinent health information and education to pregnant women that will help in addressing perceived myths and misconceptions about pregnancy-related issues, including

malaria prevention. In this instance, it presents a timely and unique opportunity to emphasize the inappropriateness and the inherent risks associated with the persistent use of chloroquine in malaria treatment and prevention in pregnancy. It is also an ideal opportunity to correct any false impressions about SP, which are not supported by evidence, and to emphasize the fact that side effects with SP are known to be rare, except for the few people who are hypersensitive to sulfa drugs.<sup>[32]</sup>

In addition, by allowing ANC clients to take their

drugs at home as was found in this study, meant that compliance could not have been guaranteed, thereby defeating the entire essence of IPTp. The practice is also in disregard of the national policy guidelines which recommend that IPTp should be directly observed by health workers. In many health facilities where IPTp were not observed, the blame has often been put on the lack or insufficiency of essential utilities like cups and potable drinking water and shortage of manpower to carry out the observation.<sup>[25]</sup> Similar findings have also been reported in a study conducted in south-west Nigeria, in rural PHC centers among ANC attendees, where despite an appreciable knowledge about malaria, the use of IPTp by pregnant women remained low.<sup>[11]</sup> However, this was unlike what was found in Tanzanian, where knowledge of malaria was associated with an increase in intermittent preventive treatment of malaria among pregnant women attending antenatal care clinics.<sup>[33,34]</sup>

Our study thus demonstrates a clear gap between general awareness about malaria and the practice of effective specific prevention against it during pregnancy. It highlights the need for appropriate dissemination of the current antimalaria treatment policy and further scrutiny of the quality of the antenatal care services provided at the primary health care centers, especially in the rural communities. This is to ensure that opportunities for malaria prevention are not missed because of the weaknesses of the health care system. This position is particularly important because ANC attendance rates even in rural communities in Nigeria are usually high,<sup>[35]</sup> while early commencement during the first and second trimesters of pregnancy was common as was seen in our study. Antenatal care services provide a good opportunity and a platform on which preventive health interventions, myths, and misconception about health can be dealt with effectively if properly delivered. We hold the view that if pregnant women clearly understood the reasons for a change in malaria treatment and prevention policy as well as imminent dangers associated with noncompliance with the recommendations, they would comply substantially with their prescriptions. However, the study is limited by the no assessment of the knowledge and practices of the health care workers themselves on current malaria treatment and prevention policy change.

## CONCLUSION

Misconceptions about IPTp persist among women known to have attended antenatal care clinics during pregnancy. The persisting chloroquine dispensing in many rural and suburban communities, despite a change in treatment policy recommending the use of SP instead of chloroquine, presents a significant challenge in current malaria control efforts. Only a minority of pregnant women receive IPTp as recommended, when the factors of ANC utilization, correct prescription, and patient compliance are added up. Therefore, the realization of the National and WHO IPTp coverage targets of at least 80% by 2015 is significantly in doubt, while the goal of attaining the malaria-related MDGs in the state by 2015 is clearly threatened.<sup>[2,36]</sup> Further studies are needed to evaluate the knowledge and practices of health care workers on the new malaria treatment policy, while efforts directed at awareness creation on the new policy are necessary to enhance the uptake of IPT in pregnancy in Rivers State.

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