



*Original article*

## The use of Sulphadoxine Pyrimethamine as a Malaria Prophylaxis for Pregnant Women in the Volta Regional Hospital

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### ABSTRACT

**Background:** Malaria has a huge negative impact on the health of most people globally. In Ghana, malaria acquired in pregnancy comes with a lot of negative consequences for both mother and foetus, and even the family. This study assessed the use of sulphadoxine-pyrimethamine (SP) as a malaria prophylaxis among pregnant women. **Methods:** The study employed a descriptive cross-sectional design. The population included an estimated number of 1000 pregnant women attending antenatal clinic in the Volta Regional Hospital within a month. The sample was 286 calculated based on Yamene formula for sample size calculation. Data was collected using a pretested questionnaire. Data collected was analyzed using statistical package for social sciences (SPSS) version 22. **Results:** Majority (238, 82.33%) of the respondents had knowledge on SP but several knowledge gaps identified among the pregnant women on the Intermittent Preventive Therapy for malaria in pregnancy (IPTp). SP use was high amongst the pregnant women as 186 out of 286 took SP for various reasons. The study identified intrinsic and extrinsic health service related factors that influenced SP use among the pregnant women. **Conclusion:** Antenatal clinic staff should be trained on good client-provider interaction to sustain positive attitudes exhibited by staff towards pregnant women. Also, emphasis on the importance of SP through health education and community awareness creation will result in increased awareness of malaria in pregnancy.

**KEYWORDS:** Perception, Knowledge, Sulphadoxine-Pyrimethamine, Prophylaxis, Malaria, Treatment

### INTRODUCTION

Malaria is among the five top killer diseases worldwide, being the second in Africa, after HIV/AIDS [1] Malaria is still a complex public health problem in the African region, where most cases and deaths occur due to this preventable disease. Africa bears 90% of the world's burden of malaria and about 30 million women living in malaria endemic areas become pregnant and are particularly vulnerable to the adverse consequences of malaria. Out of these, 24 million pregnancies are threatened by malaria, contributing to 15%

of maternal anaemia and 35% of preventable low birth weight babies [2, 3].

Characteristic of malaria infection during pregnancy in stable transmission areas is that it is often asymptomatic due to the pre-existing immunity that has been acquired through frequent exposure to *P. falciparum* malaria infections since childhood [4]. Absence of clinical symptoms such as fever makes it difficult to recognize the disease which therefore often remains untreated. Findings from clinical studies suggest that placental malaria is common and approximately one in four pregnant women has evidence of malaria infection at the time of delivery [5].

Achievement of high coverage of these preventive interventions among pregnant women remains elusive for many countries in sub-Saharan Africa [6]. A recent review of national survey data shows that in 27 countries with survey data between the years 2009 and 2011, the median coverage of two doses of SP was 24.5% (range 7.3%–69.4%) even though the median coverage for at least two ANC visits was 84.6% (range 49.7%–96.9%, 22 countries, 2003–2011) [7, 8]. This showed that most pregnant women did not take the SP as indicated.

Malaria is hyper endemic in Ghana, with perennial transmission afflicting and affecting people of all ages. Among pregnant women in Ghana, malaria accounts for 28.1% of Out Patients' Department (OPD) attendance, 13.7% of ward admissions and 9.0% of maternal deaths [9]. Reports from the World Health Organization (WHO) indicate that Ghana had an estimated 7.2 million cases of malaria in 2006 of which 9.4% contributed to maternal deaths [2]. In endemic areas women have high levels of immunity and so may not experience fever or other malaria symptoms. During pregnancy, however, their immunity is altered and they are more vulnerable to complicated and severe malaria

World Health Organization (WHO) recommends intermittent preventive treatment with SP in areas with moderate to high malaria treatment in Africa. As of October 2012, WHO recommends that this preventive treatment be given to all pregnant women at antenatal care visits starting as early as possible in the second trimester (that is not during the first trimester). Intermittent Preventive Treatment in pregnancy- SP dose should be given at least one month apart [2]. WHO recommends at least three and a maximum of seven doses during each pregnancy. SP reduces maternal malaria episodes, maternal and fetal anemia, placental parasitaemia, low birth weight, and neonatal mortality [2].

The adverse outcomes of malaria in pregnancy can be substantially reduced by interventions that have been available for over two decades and that are inexpensive and cost-effective. Both IPTp and ITNs are commonly delivered at antenatal clinics (ANCs) through collaboration between malaria and reproductive health programs.

The problem of malaria in pregnancy is a huge one and continues to affect significant numbers of Ghanaian women and their babies. This is coupled with the fact that without healthy pregnancies, there can be no guarantee for the continuity of mankind [10]. Intermittent preventive treatment of malaria in pregnancy (IPTp) is a strategy where all pregnant women are given a full prophylactic dose of sulphadoxine-pyrimethamine (SP) during pregnancy, regardless of whether they have malaria. In the Ho Municipality, the multi-pronged approach to prevention of malaria in pregnancy is used which is intermittent preventive treatment in pregnancy (IPTp) with sulphadoxine-pyrimethamine (SP) and use of insecticide-treated nets (ITNs), together with effective case management of clinical malaria and anaemia.

Regardless of the importance and the need for pregnant women to take SP to protect themselves from the negative effects of malaria on them and their unborn babies, most pregnant women seem to react negatively to taking the treatment. Some pregnant women give negative facial expressions when taking SP. Also, some pregnant women

refuse to take the drug. It is possible that this reaction may be as a result of misconceptions or inadequate knowledge on the importance of SP. This study assessed the factors that influence the intake of SP among pregnant mothers.

The used of SP in pregnant women as a prophylaxis to malaria over the years has proven to be efficient in preventing malaria and the consequences of the disease on the unborn child and the mother. While this noble course has proven useful, many studies have concentrated on the factors that influence the distribution and usage of the drug but very few has actually concentrated on the perception of the pregnant women on the drug.

Women views and perceptions are likely to influence the intake of the drug and probably can be a significant limitation to the success choked by the used of the drug in the prevention of malaria in pregnancy. In the Volta Regional Hospital, while there are determined effort to give the prophylaxis treatment to all pregnant women at the ANC, a few report with malaria in pregnancy while others have shown adverse attitude to the intake of the drug when it is administered through the DOTs strategy.

So, the purpose of this study was to assess the knowledge and factors that influence the use of sulphadoxine-pyrimethamine as a malaria prophylaxis among pregnant women in the Volta Regional Hospital.

This study therefore assessed women perception of the intake and utilization of SP in pregnancy in the Volta Regional Hospital.

## **MATERIALS AND METHODS**

### **Study design**

This study used descriptive cross-sectional design. The research data was collected from study participants once and no follow up of participants was required.

### **Study setting**

The Volta Regional Hospital (VRH) is a major referral center for the people in the Volta region and beyond. The hospital is located on the Ho- Aflao road. The ANC is located in the maternity wing of the Volta Regional Hospital. Antenatal Clinic has a pharmacy, five consulting rooms of which four is used for antenatal services and one for postnatal services. It has a triage room, a family health unit which consists of the prevention of mother to child transmission room, family planning room as well as the child welfare clinic.

### **Study population**

The total population consisted of an estimated number of 1000 pregnant women attending antenatal clinic in the Volta Regional Hospital within a month. From this population, an estimated number of 50 pregnant women are attended to in a day. The population for this study was all pregnant women in the second and third trimester who are attendees at the Antenatal clinic of the Volta Regional Hospital.

### **Sampling**

Using Yamane formula for sample size calculation, a sample size of 286 were selected using the accidental sampling method. The sample confidence interval of 95% and a level of precision of 0.05 was used.

The formula includes:

$$n = \frac{N}{1 + Ne^2}$$

n= the sample size, N= population, e = level of precision which is 0.05

$$n = \frac{1000}{1 + 1000(0.05)^2} = \frac{1000}{1 + 2.5} = \frac{1000}{3.5} = 285.714 \approx 286$$

pregnant women

### Data collection

The data was obtained using a questionnaire. Questionnaire is a data collection tool in which written questions are presented that are to be answered by the respondents in written form. The questions were open-ended and closed. The questionnaire was in three parts. Part one described the demographic information, part two assessed knowledge on SP and part three sought to identify the use of SP. The pregnant women were assisted by trained research assistants to complete a pretested research questionnaire. The questionnaire was pre-tested among ten (10) of the pregnant women at the Ho Municipal Hospital.

### Data analysis

Data was cleaned, coded, entered into Microsoft excel spreadsheet and then transferred into Statistical Package for Social Sciences SPSS version 22 computer programme.

**Table 1: demographic characteristics of respondents**

Variables	Responses	Frequency	Percentage
Age distribution	N= 286 Mean Age ± (SD) 27 ± (5.77) years		
	15 – 20 years	45	15.73
	21 – 25 years	81	28.32
	26 – 30 years	87	30.42
	31 – 35 years	54	18.88
	36 years and above	19	6.64
Marital status	Single	94	32.87
	Married	145	52.10
	Divorced	5	1.75
	Widowed	2	0.70
	Co-habitation	36	12.59
Highest educational level	None	19	6.64
	Primary	64	22.38
	Secondary/Vocational	120	41.96
	Tertiary	83	29.02
Number of pregnancy / gravidity	1	95	33.33
	2	95	33.33
	3	58	20.35
	4	24	8.42
	5	7	2.46
	6	4	1.40
	7	2	0.70

Many (42, 14.69%) of the pregnant women live in other parts of the Volta region including; Hohoe, Kpando, Kpetoe and Sokode while the remainder were from Ho township. Pregnant women were engaged in trade (30.77%), artisanship (22.03%), civil servants or government employees (19.93%) and unemployed (12.59%). The others, were students (7.69%), farmers (4.90%), housewives (1.40%) and mobile money agents (0.70%).

Simple descriptive statistics were used as the basis for data analysis.

### Ethical consideration

Ethical clearance for this study was gotten from the Research Ethics Committee in the Institute of Health Research at the University of Health and Allied Sciences. Permission was obtained from the administrator of Volta Regional Hospital, Medical Director and the nurse in-charge of the ANC. Informed consent was obtained from each participant. Participation was voluntary and without any coercion. The aim and the reason for the study was explained to the respondents. Participants were not required to provide their names to ensure anonymity.

## RESULTS

### Demographic characteristics of respondents

A total of two hundred and eighty six (286) pregnant women participated in this study. Participants aged from 16 to 43 years and majority 168(58.74%) were aged between 20 – 31 years with a mean age of 27 ± 5.77 years as shown in table 1. A good proportion of them 145(52.10%) was married with 203(70.98%) having at least secondary education. Majority (88, 30.77%) of the pregnant women were traders and engaged in various types of trades and two-thirds had less than three pregnancies, 190(66.43%) (Table 1).

Respondents were 4 months pregnant(5.94%), 5 months pregnant(12.94%), 6 months pregnant(23.43%), 7 months pregnant(26.92%), 8 months pregnant(21.68%), 9 months pregnant(8.74%) and 1(0.35%) respondent was post term (10 month pregnant).

The number of ANC attendance indicated that 3(1.05%) had a visit, 24(8.39%) twice, 57(19.93%) trice, 72(25.17%) four times and 54(18.88%) five times. Others had six times

(10.14%), seven times (5.24%), eight times (5.24%), nine times (0.70%), and ten times (2.45%) eleven times (2.45%) and 1 (0.35%) respondent visited the ANC twelve times.

### KNOWLEDGE OF RESPONDENTS ON SULPHADOXINE-PYRIMETHAMINE USE

**Table 2: Distribution of Level of Agreement of Respondents on the Dosage, Eligibility, and Route of administration and Mechanism of Action of SP**

Variables	Responses	Frequency	Percentage
SP can be taken anytime during pregnancy	Strongly Agree	29	10.14
	Agree	44	15.38
	Disagree	126	44.06
	Strongly Disagree	87	30.42
SP is only taken by mouth	Strongly Agree	198	69.23
	Agree	75	26.22
	Disagree	7	2.45
	Strongly Disagree	6	2.1
Two tablets of SP is administered at a go	Strongly Agree	42	14.69
	Agree	41	14.34
	Disagree	133	46.5
	Strongly Disagree	70	24.48
SP is given to be taken home	Strongly Agree	15	5.24
	Agree	22	7.69
	Disagree	103	36.01
	Strongly Disagree	146	51.05
SP is used to cure malaria in pregnancy	Strongly Agree	99	34.62
	Agree	75	26.22
	Disagree	68	23.78
	Strongly Disagree	44	15.38

Respondents described the colour of SP as white (90.21%), red (2.10%), and yellow (6.29%) and green (1.4%). Pregnant women indicated three tablets of SP are administered at once (66.43%), two tablets (24.48%), a single tablet (8.74%) while 0.35% indicated four tablets. Furthermore, 254(88.81%) respondents said SP is taken

monthly, 13(4.55%) said it is taken daily, 13(4.55%) also said it is taken weekly and 6(2.10%) said SP is taken yearly. On any religious or cultural restrictions to intake of SP, 5(1.75%) had religious restrictions. With regards to non-adherence and skipping of SP, 237(82.87%) said they have never skipped SP in their current pregnancy.

**Table 3: Factors Influencing Use and Non-Use of SP**

Variable	Responses	Frequency	Percentage
Reasons for taking SP	Prevents malaria in pregnancy	103	55.4
	Protects baby and mother	66	35.5
	Compulsory	15	8.1
	Does nothing to me	1	0.6
	Gives enough blood	1	0.5
Reasons for not taking SP	Beliefs and religious reasons	2	2
	allergic to SP	8	8
	Don't like medicine	5	5
	Don't like taking pills/tablets	6	6
	Feel dizzy after taking SP	10	10
	Uses mosquito net	1	1
	Vomit after taking SP	20	20
	Bitter and the tablets are too big	40	40
Feel sick	1	1	

	Skin itches	3	3
	No reason	4	4
Perceive side effects of SP	Vomits	45	15.7
	Skin itches	22	7.7
	Dizzy and weak	8	32.0
	Dull, full or lose appetite	6	24.0
	Very uncomfortable	2	8.0
	Abdominal pains	2	8.0
	Have diarrhea	3	12.0
	Sweat a lot	1	4.0
	Have nausea, vomit and my skin itches	3	12.0
Reasons for skipping SP doses	Allergic to SP	12	22.5
	Could not attend ANC	21	42.9
	Did not eat that day	1	2.0
	Did not feel like taking SP	3	6.1
	Feel uncomfortable after taking SP	5	10.2
	Have abdominal pains and nausea	2	4.1
	Religion and belief	2	4.1
	No reasons	2	4.1

## DISCUSSION

The study assessed the knowledge and factors that influence the intake of SP as a malaria prophylaxis in the Volta Regional Hospital. Majority (83.22%) of pregnant women responded appropriately to over 50% of variables related to knowledge – indicating a higher level of knowledge on SP among pregnant women. Chukwurah et al., (2016), report on knowledge, attitude and practice on malaria prevention and Sulphadoxine-Pyrimethamine utilization among pregnant women in Badagry, Lagos State, Nigeria showed that majority more than 70% of the pregnant women had adequate knowledge [11].

The awareness of the pregnant women on SP was widespread but the overall inconsistency in knowledge was shown as 4.55% disagreed that SP was taken orally at the ANC. These knowledge gaps may be as a result of deliberate default of ANC, refusal to take SP or inappropriate understanding of what constitute SP as a prophylaxis. The inadequacy in the knowledge was also shown when 66.43% pregnant women indicated that three tablets of SP are administered at once. Low levels of knowledge was reported elsewhere as pregnant women demonstrated low knowledge in the use of the SP as a malaria prophylaxis [12].

This study identified several factors that influence SP patronage among pregnant women. The factors were intrinsic and extrinsic. Intrinsic factors identified to affect SP use were allergies, adverse side effects of SP and default from ANC services. Most respondents who reported to dislike taking SP complained of the adverse effects of the drug while 38% complained that SP is bitter and leaves an unpleasant taste in the mouth.

Nevertheless, some pregnant women did take SP because of the high knowledge of the fact that it prevents them from contracting malaria (55.38%). Vallely et al., (2010), stated that client beliefs on the effects of SP on pregnancy is also a factor that influence the patronage of SP. They indicated that, 28(9.79%) of the pregnant women agreed that SP can destroy their pregnancies. This is a key factor that divulge

the reason for low SP coverage [13]. Also NBS (2010) agreed that patterns of beliefs and behavior influence health care seeking modalities during pregnancy which consequently affect SP use and coverage [14].

A mean ANC attendance of 4.7 and a modal visit of 4 was recorded among the pregnant women. This is due to the fact that the Ghana Health Service recommends four (4) National Health Insurance Scheme (NHIS) paid visits during each pregnancy whilst the uptake of IPT-SP from sixteen (16) weeks of gestation monthly will need five or more. Ghana Health Service (GHS) should as a matter of policy and in collaboration with the National Health Insurance Scheme, reconcile the number of recommended paid antenatal visits and the number of doses of IPT-SP each pregnant woman is supposed to take during each pregnancy.

Clients who complained of allergies to sulphur drugs and SP seemed not to have any other alternative as prophylaxis against malaria at the Volta Regional Hospital. This, despite has no significance influence to SP coverage, affects IPTp and leads to malaria in pregnancy.

Extrinsic factors that influence SP patronage, identified in this study included, but not limited to faith and religious constraints, inability of the pregnant women to attend ANC and level of information received on SP and IPT. This can also be related to inadequate information on SP. Education influences an individual's self-efficacy and judgment. Most of the pregnant women who have faith or religious restrictions to SP believe SP can help them but lack enough information and empowerment to initiate the usage of SP. Surprisingly, only one respondent gave religious reasons for deliberate skipping of her SP schedule.

A respondent skipped SP because she had not eaten (2.4%) before visiting the ANC. Similar findings on the belief that SP is not taken on an empty stomach were reported by Antwi (2010) in the Bosomtwe District [15] and Ibrahim (2015) in Sunyani Municipality [16]. These findings are not consistent with the IPT policy which specifically state that SP can be administered as soon as possible in the second

trimester at monthly intervals till delivery and even on an empty stomach [2]. This depicts knowledge gaps on the SP and IPT policy among workers in the Volta Regional Hospital.

Service provider factors that influence non-use of SP were identified in this study as poor health educational practices, no-tracing of defaulters and poor reaction to pregnant women complaints on the side effects of SP. Some (23.43%) of the pregnant women stated that they were not educated prior to administration of SP. Mubyazi (2008), Olliaro et al. (2008), Antwi (2010) and Ibrahim (2015) identified shortage of drugs and water at health facilities as barriers to effective SP uptake by clients [6, 15, 16, 17].

## CONCLUSION

Findings from this study suggest that majority of the pregnant women attending ANC at the Volta Regional Hospital had knowledge on SP (IPT). It was however discovered in this study that most pregnant women refuse to take SP due to the undesirable side effects of the drug. The study also showed that SP use was high and most respondents who liked taking SP knew it was for malaria prevention in pregnancy. Health service factors that influence SP use were poor educational practices, poor defaulter tracing by health staff and inadequate response to pregnant women complaint of side effects of SP.

## RECOMMENDATIONS

ANC staff should be trained on good client-provider interaction to sustain positive attitudes exhibited by staff towards pregnant women. This will result in high uptake of SP. Also, emphasis on the importance of SP through health education and community awareness creation will result in increased awareness of malaria in pregnancy and its associated complications thereby creating the need for people to imbibe preventive measures.

The Municipal Health Directorate in line with improving drug surveillance as part of ANC services should readily make available at the ANC clinics, adverse effects forms. This can help document the adverse effects of IPT-SP and to provide evidence for health education of the pregnant women on the side effects of the drug.

The Municipal Health Directorate should provide educational materials on SP and IPT in all facilities in the region to improve client education.

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