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Full Length Research Paper

The use of intermittent preventive treatment with sulphadoxine-pyrimethamine in pregnancy in Ibadan, Nigeria: Implications for policy

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Malaria in pregnancy (MIP) remains a major public health concern, inspite of the adoption of WHO recommended intermittent preventive treatment (IPTp) with sulphadoxine-pyrimethamine (SP) for its control in Nigeria. Using interviewer administered questionnaires, information on knowledge of the burden, consequences and the use of SP for malaria control in pregnancy was obtained from 800 mothers within 24 h after delivery at two health centres in Ibadan. Women who attended antenatal care (ANC) at the secondary facility were less likely to demonstrate poor knowledge of causes (OR = 0.18, 95% CI = 0.08, 0.38), consequences (OR = 0.37, 95% CI = 0.24, 0.55) and control strategies (OR = 0.32, 95% = 0.18, 0.59) compared with tertiary facility. Only 56.4% of all the mothers were aware of IPTp SP as government policy for prevention of MIP out of which 16.9% used IPTp SP in index pregnancy. Overall, only 18.4% of all mothers used IPTp SP. Being unaware of the existing government policy and educational attainment of ≤9 years independently predicted non-usage of IPTp SP. This study revealed that the uptake of IPTp SP in pregnancy is poor in spite of good knowledge of burden of malaria in pregnancy and underscores the need to scale up awareness campaign and monitor implementation at all levels of health care.

Key words: Malaria in pregnancy, intermittent preventive treatment, sulphadoxine-pyrimethamine.

INTRODUCTION

Plasmodium falciparum malaria infection in pregnancy especially among the primigravidae and secundigravidae, whether symptomatic or asymptomatic may contribute to as much as 15% of maternal anaemia, 70% of intrauterine growth retarded deliveries, 36% of preterm delivery and 30% of preventable low birth weight deliveries (Brabin, 1997; Steketee et al., 2001). The high burden of malaria has led to the development of effective strategies such as vector control, early case detection and treatment as well as the administration of Intermittent Preventive Treatment in pregnancy (IPTp) for malaria using sulphadoxine-pyrimethamine (SP) (White, 2005).

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According to the Abuja declaration of April, 2000 the African heads of states promised to ensure the use of insecticide treated net (ITN) and chemoprophylaxis in at least 60% of children under 5 years and pregnant women (Yamey, 2000). The need for the reduction of the associated morbidity and mortality of malaria in pregnancy (MIP) necessitate the require assessment and proper documentation of the knowledge and practices of mothers that may militate against or promote malaria control. The adoption of IPT SP as a strategy for control of malaria in pregnancy has been shown to significantly reduce the incidence of placental parasitaemia, maternal anaemia, the rate of low birth weight deliveries and peri-natal death especially in developing countries including Nigeria (Shulman et al., 1999; Rogerson et al., 2000; van Eijk et al., 2004; Kayentao et al., 2005; Falade et al., 2007). The Nigerian national policy involves the administration of two

curative doses of SP given during the second and third trimesters of pregnancy, one month apart (Federal Ministry of Health (FMOH) 2005). This policy recognizes the need for continuous monitoring of the implementation and its impacts in order to ensure set targets are met. Achieving this National targets require community acceptance and utilisation of such interventions which will depend on the awareness as well as knowledge of the policy. The knowledge of recently delivered pregnant women on the burden of malaria in pregnancy as well as the level of awareness and utilization SP as IPTp at all levels of health care may be necessary for effective policy implementation. Therefore this crossectional study aims at identifying the constraints to access and the use of IPTp SP for malaria control in pregnancy at secondary and tertiary health care facilities in Ibadan Nigeria. It is hoped that the result of this study would provide information to policy makers, programme managers and reproductive health workers.

MATERIALS AND METHODS

Location of study

The study was carried out at the labour wards of the University College Hospital, a tertiary health facility and Adeoyo Maternity Hospital, the main secondary health facility, both located in Ibadan North Local Government Area with a population of 306,795 (Census, 2006) and annual population growth rate of 2.3%. Over half of the estimated deliveries in Ibadan municipal take in place in the health centre with the secondary health facility being closer to the sub-urban population that the tertiary health centre. Both health centres have affiliated primary health centres from where cases are often referred. In addition, the organisation antenatal care services are similar in design.

Instrument for data collection

This study utilized an interviewer administered semi-structured questionnaire, translated from English to Yoruba (the local language) and back translated into English for accuracy. The questionnaire had the following parts;

- Socio-demographic characteristics
- Knowledge of the magnitude of the burden of malaria, possible causes of malaria and clinical features.
- Knowledge of the consequences of malaria in pregnancy and knowledge of control strategies.
- Utilization of malaria preventive measures in this index pregnancy.

The questionnaire was pretested at a randomly selected health centre in another local government among 50 mothers. The results of the pretesting were used to rephrase ambiguous questions and improve the understanding of the questions concerned.

Conduct of study

Over a 3 month period, 800 consecutive consenting mothers out of 1220 who delivered at the study sites were included in this cross-sectional study design and interviewed within 24 h after delivery by five trained research assistants using a semi-structured questionnaire. Knowledge of burden, causes, clinical presentations, consequences and prevention of malaria in pregnancy was assessed using a 16, 10, 9, 10 and 12 question items, respectively giving total of 57 questions. A score of 1 mark was allotted for correct answer and 0 for a wrong answer. Total score for all aspects tested was converted to a scale 100%. A score of ≥50% was considered good knowledge while <50% was poor knowledge.

Data analyses

All data were entered and analyzed with SPSS for Windows 14.0 (Chicago, USA). Differences in proportions were compared using Chi square test. Univariate analyses was done to determine the Odds ratio (OR) and 95% Confidence Interval (CI) for use of SP. Variables found associated with use of SP were further subjected to logistic regression analysis to determine predictors of SP use. P value was considered significant if less than 0.05.

RESULTS

Eight hundred mothers were interviewed with 476 (59.4%) and 324 (40.5%) from secondary and tertiary health facilities, respectively. The mean age of subjects were 28.5 ± 5.2 years for secondary health facility and 30.7 ± 4.5 years for tertiary facility (p = 0.000) with 89 and 85.1% being aged group 21 - 35 years in secondary and tertiary health facilities, respectively. The demographic characteristics of the study participants were as shown in Table 1. Majority (95.1%) of the mothers received antenatal care with 64.7% having had 4 - 7 antenatal visits. A higher proportion of mothers (72.9%) and fathers (78.5%) with more than 12 years of formal education attended ANC at the tertiary health facility compared with 23.8% of mothers and 36.7% of fathers in the secondary facility.

Poor knowledge of the burden of malaria was significantly associated with low educational attainment (Table 2) and site of ANC (Table 3). Women who attended ANC at the secondary health facility are more likely to demonstrate poor knowledge compared with tertiary health facility (OR = 1.89; 95% CI = 1.21, 2.93); Table 2. Almost all (94.3%) respondents knew that mosquitoes are responsible malaria transmission. In addition, others perceived causes included agents transmissible in drinking water (68.8%), working in the sun (68.2%), excessive work (62.4%), yellowness of eyes (51.6%), eating oily food (38.5%), bad air (31.1%), being beaten by rain (23.8) and sleeping in the afternoon (17.7%). More of the mothers who had ANC at the tertiary health facility (15.3%) showed poor knowledge of the causes of malaria compared with secondary facility (3.1%); p = 0.000 (Table 2) and differences in educational attainment of mothers did significantly affect their knowledge of the causes of malaria (Table 3). Irrespective of educational attainment and place of ANC, more than two-thirds of mothers knew that malaria in pregnancy could present

Table 1. Demographic characteristics of study subjects.

Characteristics	Health facility		All subjects	P
	Secondary (%)	Tertiary (%)		
Mothers' age				0.003
<21	2.8	0.6	1.9	
21 - 35	89.0	85.1	87.4	
>35	8.2	14.2	10.6	
Mother's level of education				0.000
None	3.6	0.9	2.5	
≤ 9 years	28.0	6.2	19.2	
10 - 12 years	44.6	19.9	34.7	
Over 12 years	23.8	72.9	43.6	
Father's level of education				0.000
None	1.9	0.6	1.4	
≤ 9 years	11.4	3.7	8.3	
10 - 12 years	50.0	17.1	36.7	
Over 12 years	36.7	78.5	53.6	
Marital status				1.000
Married	99.2	99.0	99.1	
Unmarried/Separated	0.8	1.0	0.9	
Parity				0.000
Primigravidae	1.3	26.6	11.5	
> Primigravidae	98.7	73.4	88.5	

Table 2. Rating of knowledge of MIP by health facility of participants.

	% in Health facility			OR	95% CI	p
	Both	Secondary	Tertiary			
Knowledge of burden				1.89*	1.21, 2.93	0.004
Poor	13.9	16.8	9.7			
Good	86.1	83.2	90.3			
Knowledge of causes				0.18+	0.08, 0.38	0.000
Poor	8.1	3.1	15.3			
Good	91.9	96.9	84.7			
Knowledge of consequences				0.37+	0.24, 0.55	0.000
Poor	14.0	9.0	21.4			
Good	86.0	91.0	78.6			
Knowledge of control strategies				0.32+	0.18, 0.59	0.000
Poor	6.3	3.6	10.2			
Good	93.8	96.4	89.8			

*OR > 1 mean positive association; +OR < 1 mean negative association or protector effect.

Table 3. Rating of knowledge of MIP by years of formal education of participants.

	% in each years of formal education				P
	None	≤9	10 - 12	>12	
Knowledge of burden					0.001
Poor	20.0	22.9	14.2	9.2	
Good	80.0	77.1	85.8	90.8	
Knowledge of causes					0.144
Poor	10.0	3.3	6.6	10.7	
Good	90.0	96.7	93.4	89.3	
Knowledge of consequences					0.054
Poor	20.0	11.1	10.5	17.3	
Good	80.0	88.9	89.5	82.7	
Knowledge of control strategies					0.009
Poor	10.0	3.9	3.3	9.2	
Good	90.0	96.1	96.7	90.8	

with fever (94.5%), body aches (92.6%), weakness/easy fatigability (92.4%) as well as headaches (88.4%), vomiting (86.5%), passage of dark red urine (67.4%) and yellowness of eyes (65.3%). Mothers (60.7%) recognised that malaria may be asymptomatic.

Eighty five percent of the mothers knew that malaria attacks are more severe in pregnancy and 79% knew that pregnancy predisposes to more frequent attacks. Other consequences of MIP mentioned by the mothers included anaemia (87.5%), maternal death (83.6%), pregnancy loss (82.5%), preterm delivery (81.4%) and small for dates baby (73%). More of the mothers who attended ANC at the tertiary facility (21.4%) demonstrated poor knowledge of the consequences of MIP compared with those mothers at the secondary facility (9.0%); p = 0.000, OR = 0.37, 95% CI = 0.24, 0.55, (Table 2). Table 3 shows that educational attainment did not impact on the knowledge of the consequences of MIP.

Majority of the mothers mentioned environmental sanitation (96.1%), the use of insecticide sprays (94.5%), mosquito coils (88.1%) and insect repellent creams (87.1%) as preventive measures. Other measures identified by the mothers were window nets (95.5%), untreated bed nets (95.1%) and insecticide treated bed nets (94.0%). The use of antimalarial drugs (56.4%) and local herbal preparations (54.6%) were identified as preventive measures. More mothers (96.4%) from the secondary facility than tertiary facility (89.8%) had good knowledge of the control measures (OR = 0.32, 95% CI = 0.18, 0.59). Also, there was a significant association between educational attainments and knowledge of control strategies as more mothers with no formal education (10.0%) had poor knowledge compared with other cadres (p= 0.000).

Overall, only 56.4% of all the mothers were aware of SP IPTp as government policy for prevention of MIP. More mothers at the tertiary facility (77.1%) compared with 42.3% at the secondary facility were aware of SP IPTp as government policy (OR = 0.22, 95% = 0.16, 0.30). Of the 451 mothers who were aware of SP IPTp as government policy for prevention of MIP, 76 (16.9%) knew the correct dosage and timing. Six hundred and fifty-three mothers did not use SP in the index pregnancy. Table 4 shows the characteristics of these mothers such that of the non-users of SP in index pregnancy, 48.5% were not aware of government policy of IPTp SP and 65.8% had ANC at secondary facility compared with 21.8 and 32.0% of users of IPTp SP. The majority of mothers (69.2%) who did not use IPTp SP in the index pregnancy gave no reasons. Among reasons given by others included SP not being affordable (5.4%), lack of belief in the efficacy of SP (1.8%), preference for other measures (15.9%) and non-availability of SP at the facility (0.9%). Among factors found associated with non-usage of IPTp SP only parity was not an independent predictor (p = 0.195) (Table 5). Being unaware of MIP policy, ANC booking at secondary health facility and attainment of ≤ 9 years of education could independently predict the use of SP during pregnancy.

DISCUSSION

Despite the adoption IPTp policy as a malarial control

Table 4. Factors associated with utilization of SP as MIP among study participants.

Factors	Not used		Use		OR	95% CI
	n	%	n	%		
Being aware of SP as a national policy					3.39	2.22, 5.16
No	317	48.5	32	21.8		
Yes	336	51.5	115	78.2		
Years of formal education					3.46	1.90, 6.28
≤ 9 years	164	25.1	13	8.8		
> 9 years	489	74.9	134	91.2		
Parity					2.59	1.61, 4.17
> 1	592	90.7	116	78.9		
0	61	9.3	31	21.1		
Health facility					4.10	2.80, 6.01
Secondary	430	65.8	47	32.0		
Tertiary	223	34.2	100	68.0		

OR > 1 mean positive association

Table 5. Logistic regression analysis for prediction of non-use of IPTp SP among mothers.

	B	S.E.	p	Exp(B)	95% CI for Exp(B)
Being unaware of MIP policy	-0.824	0.229	0.000	0.439	0.280, 0.688
Health facility (secondary)	-0.958	0.222	0.000	0.384	0.248, 0.593
Educational level (≤ 9 years)	-0.683	0.320	0.033	0.505	0.270, 0.945
Parity (≥ secundigravidae)	-0.348	0.268	0.195	0.706	0.417, 1.194
Constant	-0.340	0.234	0.147	0.712	

strategy in 2004 in Nigeria as well as its burden on the health services, this study showed only 18.4% of the mothers used SP which was much lower than 36% in Malawi (Wisselink et al., 2004) but higher than 5% reported among pregnant women from Kenya (Guyatt and Snow, 2004). The poor uptake of IPTp SP in this study was influenced by lack of awareness of the policy, low level of education and the site of ANC.

The present study as in Malawi (Wisselink et al., 2004) also showed a significant gap in what is known and practised at the health facilities as more than 90% of the mothers were aware of IPTp SP but utilization was low. This finding highlights the needs for improvement of implementation process such as health education and promotion at all levels of health care in Nigeria in order to achieve the health related Millennium Development Goals. It was also apparent that higher proportions of mothers who had ANC at tertiary health facility had poorer knowledge of the causes, consequences and control strategies compared with secondary facility. This may possibly be related to poorer contents and quality of health education and promotion at tertiary health facility.

The finding that women who had had previous deliveries were more than twice less likely to take IPTp SP compared to those who had first delivery is a challenge for programme managers in Nigeria and should prompt a re-evaluation of a process of drug delivery and health education and promotion for this group. Possible explanation for this may include the fact that mothers who had had more than one delivery may not consider the importance of MIP and downplayed the risk.

The cross-sectional design of the present study is based on self-reporting which made it prone to recall and social desirability biases. Also, a possible drawback is the single estimate which does not allow for generalization the results beyond the period of the study. No method was put in place to verify that SP was taken as reported by the women. The presence of third variables acting as confounders or modifiers could have an effect in the results of the present study.

The policy implication of this study identifies the need for integration of reproductive health services and malarial control programme by the stakeholder at all levels. Target groups such as those women who have had more than one delivery and those with poor knowledge of causes and consequences of MIP should be recognised and addressed. There is also the need for sensitisation and refresher courses for health care providers at all levels of the Nigeria health system. A notable challenge identified was that despite the free provision of the SP and administration under direct supervision of health workers spelt out in the policy statement of the Nigerian Government, utilization remains poor. This makes it imperative to monitor the activities at the health facilities.

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REFERENCES

Brabin B (1997). Malaria in pregnancy: current issues. Afr Health 19: 19-20.

Falade CO, Yusuf BO, Fadero FF, Mokuolu OA, Hamer DH , Salako LA (2007). Intermittent preventive treatment with sulphadoxine-pyrimethamine is effective in preventing maternal and placental malaria in Ibadan, south-western Nigeria. Malar. J., 6: 88.

Federal Ministry of Health (FMOH) (2005). National Guidelines and strategies for malaria prevention and control during pregnancy. Abuja, Nigeria, Federal Ministry of Health.

Guyatt HL, Snow RW (2004). Impact of malaria during pregnancy on low birth weight in sub-Saharan Africa. Clin. Microbiol. Rev., 17: 760-769, Table of contents.

Kayentao, K, Kodio M, Newman RD, Maiga H, Doumtabe D, Ongoiba A, Coulibaly D, Keita AS, Maiga B, Mungai M, Parise ME, Doumbo O (2005). Comparison of intermittent preventive treatment with chemoprophylaxis for the prevention of malaria during pregnancy in Mali. J Infect. Dis., 191: 109-116.

Rogerson, SJ, Chaluluka E, Kanjala M, Mkundika P, Mhango C, Molyneux ME (2000). Intermittent sulfadoxine-pyrimethamine in pregnancy: effectiveness against malaria morbidity in Blantyre, Malawi, in 1997-99. Trans. R. Soc. Trop. Med. Hyg., 94: 549-553.

Shulman, CE, Dorman EK, Cutts F, Kawuondo K, Bulmer JN, Peshu N, Marsh K (1999). Intermittent sulphadoxine-pyrimethamine to prevent severe anaemia secondary to malaria in pregnancy: a randomised placebo-controlled trial. Lancet 353: 632-636.

Steketee, RW, Nahlen BL, Parise ME, Menendez C (2001). The burden of malaria in pregnancy in malaria-endemic areas. Am. J. Trop. Med. Hyg., 64: 28-35.

van Eijk, AM, Ayisi JG, ter Kuile FO, Otieno JA, Misore AO, Odondi JO, Rosen DH, Kager PA, Steketee RW, Nahlen BL (2004). Effectiveness of intermittent preventive treatment with sulphadoxine-pyrimethamine for control of malaria in pregnancy in western Kenya: a hospital-based study. Trop. Med. Int. Health, 9: 351-360.

White NJ (2005). Intermittent presumptive treatment for malaria. PLoS Med., 2: e3.

Wisselink HW, Mars AE, van der Meer P, Eggink G, Hugenholtz J (2004). Metabolic engineering of mannitol production in Lactococcus lactis: influence of overexpression of mannitol 1-phosphate dehydrogenase in different genetic backgrounds. Appl. Environ. Microbiol., 70: 4286-4292.

Yamey G (2000). African heads of state promise action against malaria. Bmj 320: 1228.