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Knowledge, Attitudes and Perceptions of Malaria in Pregnancy Among Pregnant Women Attending Antenatal Clinics at Hospitals in Okitipupa, Ondo State, Nigeria

Adeyemi OO*

Department of Public Health, Adeleke University, Ede, Osun State, Nigeria

*Corresponding author: Omoge O. Adeyemi, Department of Public Health, Adeleke University, Ede, Osun State, Nigeria, Tel: +2348035203870; Email: omogeadeyemi@gmail.com

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Abstract

Background: Malaria is a life threatening parasitic disease caused by Plasmodium Species, transmitted by female Anopheles mosquitoes. Malaria in pregnancy is an obstetric, social and public health problem of all over the world particularly in tropical and sub-tropical countries which can have serious consequences for both the mother and her unborn child.

Objective: The objective of this study was to gain more understanding on the knowledge, attitudes and perceptions on malaria in pregnancy among pregnant women attending antenatal clinics at hospitals in Okitipupa, Ondo state.

Methodology: This was a descriptive cross-sectional study. A multistage random sampling method was used to select 165 pregnant women attending antenatal clinics at hospitals in Okitipupa. Quantitative method was used for data collection. A self-administered 50 items questionnaire containing 4 sections was used for data collection. Data was analyzed using SPSS version 23.

Results: The mean age of the respondents was 28.6±5.1 years, 66.1% were between 26-35 years, 95.2% were Christians, 84.2% were Yoruba, and 52.7% had secondary school education, 81.8% have had 1-3 pregnancies and births, 40.6% were in their third trimesters. 35.8% were traders. 95.2% of the women strongly had a good knowledge of malaria in pregnancy, 60% strongly agree that antenatal clinics helps in early detection of malaria in pregnancy and 60.6% strongly agree that malaria test during pregnancy is essential for early detection of malaria in pregnancy. The chi-square revealed that there is a relationship between age ($p < 0.001$), level of education ($P < 0.000$), health care centre ($P < 0.001$) and Knowledge, Attitudes and Perceptions of malaria in pregnancy.

Conclusion: This study therefore concluded that malaria in pregnancy is a global burden which its present and future effects are very dangerous to the health of the individual, mother and the foetus in the womb, family, society and the nation at large. It is therefore recommended that health education on malaria in pregnancy should be upheld in high esteem. A clear understanding of the knowledge, attitudes and perceptions of a particular community can inform the design of Behavioural Change Communication (BCC) campaigns to measure the risk influence acceptance and use of any malaria control measures.

Keywords: Attitudes; Knowledge; Malaria; Pregnancy; Perceptions

Introduction

Malaria is a life threatening parasitic disease transmitted by

female Anopheles mosquitoes. The infection during pregnancy is a major public health problem in tropical and subtropical regions of the world. In most endemic areas of Africa, pregnant women are the main adult risk group for malaria [1]. Every year at least 30 million women in malaria prone areas of Africa become pregnant; most of these women live in areas of relatively stable malaria

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transmission (WHO, 2005).

The main burden of malaria infection during pregnancy results from infection with *Plasmodium falciparum*. (P. falciparum). Pregnant women are known to be more susceptible than non-pregnant women to malaria, and this susceptibility is greatest in first and second pregnancy [2]. Maternal death may result either directly from severe malaria or indirectly from malaria related severe anaemia. In addition, malaria may result in a range of adverse pregnancy outcomes, including low birth weight (LBW), spontaneous abortion and neonatal death (WHO, 2003).

There has been an increase in human and financial commitments to the control of malaria nationally and internationally [3]. It creates a major challenge and of public concern in Nigeria with a high prevalence rate. Federal Ministry of Health (2008) posited that malaria accounts for 110 million clinical cases annually. The Federal Ministry of Health in Nigeria stated that malaria has great impact on the nation's economy as about N132 billion is lost to malaria in form of treatment, cost, preventive and loss of man hours. The burden of malaria contributes substantially to the poor health situation in Africa and still remains a major global problem (WHO/UNICEF, 2005). It has devastating effects on both health and development, exacting its greatest toll on the world's poorest and most marginalized (WHO/UNICEF, 2005).

Malaria in pregnancy is an obstetric, social and medical problem in most parts of the world particularly the tropical and sub-tropical countries. Moreover, approximately 50 million women are living in malaria-endemic countries throughout the world become pregnant in each year [4]. It is worth noting that, malaria worsens during pregnancy and together with anaemia is responsible for 10,000 maternal deaths and 200,000 infant deaths per year [5-7].

Malaria is a major public health problem in Nigeria where it accounts for more cases and deaths than any other country in the world (Nigeria Malaria Factbook, 2011). Malaria is a risk for 97% of Nigeria's population and contributes to an estimated 11% of maternal mortality. (Nigeria Malaria Factbook, 2011). Early diagnosis and prompt effective treatment of malaria illness has been a cornerstone of malaria control [8].

This study therefore seeks to investigate the pregnant women in Okitipupa community's knowledge, attitudes and perceptions (KAP) on malaria in pregnancy (MiP) [9].

Materials and Methods

Study area

This study was conducted in Okitipupa, Ondo State. It has always been known as Ode-Idepe. The name Okitipupa originated from the elevation of the town and the colour of the soil which is red in colour referred to in Yoruba language and its dialects as 'pupa'. Okitipupa is derived from Yoruba language Okiti (Hilly)

and Pupa (Red). There are various rivers in this Local Government Area like River Oluwa, Ofe, Miller, Yewa, Obondepe, Logoji and others that are numerous to mention that all goes to the Atlantic Ocean. The presence of various rivers in this area provides breeding places for mosquitoes to develop from egg to adult mosquito stage. This has contributed to an increase in malaria in pregnancy among women attending antenatal clinic in Okitipupa, Ondo State. It has a Specialist Hospital, several Private Hospitals and Primary Health Care (PHC) facilities that provide antenatal care services for the pregnant women in Okitipupa. The residents of Okitipupa are predominantly farmers. It has an area of 803 km² and a population of 272,030 [10-15].

Study population

The study population comprises of all the pregnant women attending antenatal clinics at hospitals in Okitipupa, Ondo state. Leslie Kish formula ($n = Z^2 \times pq/d^2$) was used for calculating sample size. (Where; $z^2 = 1.96^2$, $p = 11\%$ (World Malaria Report, 2011), $q = 1 - p$, $d^2 = 0.05^2$).

Study design and sampling

A cross-sectional descriptive method was adopted. A multistage sampling method was used in selecting the respondents from State Specialist Hospital and Comprehensive Health Centre, Ebute, Okitipupa which are both government owned health facilities.

Data collection methods

Information was collected using self-administered questionnaire. Questionnaire was pretested and used to collect data from the sample of population. 165 pregnant women were sampled and administered questionnaires to. The questionnaire comprised of questions on Socio-Demographic information, Knowledge on malaria in pregnancy, Attitude towards malaria in pregnancy and Perceptions on malaria in pregnancy [16].

Data analysis

The responses of the respondents were analysed using Statistical Package for Service Solutions (SPSS) Version 23. The computation was done using tables, charts, means and simple percentages. The research statistics was tested at 0.05% level of significance and Bivariate analysis was done with chi-square test.

Ethical consideration

Letter of introduction was sought from the Faculty of Basic Medical Sciences, Adeleke University, Ede. Approval to conduct the research in the health facilities in Okitipupa was also sought from the authority in the various health facilities. Informed consent was obtained from the respondents before administering the questionnaire and confidentiality of all respondents was ensured.

Results

	Variables	Frequency (%)
Age group (in years)	16-25	41 (24.9%)
	26-35	109 (66.1%)
	36-45	15 (9.1%)
	Mean+Std Deviation (28.6+5.1)	-
Gender	Female	165 (100%)
Marital status	Married	165 (100%)
	Christianity	157 (95.2%)
Religion	Islam	7 (4.2%)
	Traditional	1 (0.6%)
	Yoruba	139 (84.2%)
	Hausa	3 (1.8%)
Ethnicity	Igbo	10 (6.1%)
	Others	13 (7.9%)
Number of pregnancies ever had and births	1-3	135 (81.8%)
	4-5	16 (9.7%)
	6 and above	14 (8.5%)
Gestational age (months)	First (1-3)	32 (19.4%)
	Second (4-6)	66 (40.0%)
	Third (7-9)	67 (40.6%)
	<10,000	51 (30.9%)
	10,000-30,000	79 (47.9%)
Level of income	31,000-50,000	25 (15.2%)
	51,000 and above	10 (6.1%)
	Primary	5 (3.0%)
Educational level	Secondary	87 (52.7%)
	Tertiary	77 (44.2%)
	Trading	59 (35.8%)
	Teaching	27 (16.4%)
Occupation	Civil Servant	19 (11.5%)
	Self-Employed	42 (25.5%)
	Unemployed	18 (10.9%)
	State Specialist Hospital	95 (57.6%)
Hospital/health centre name	Comprehensive Health Centre	70 (42.4%)

Table 1: Socio-Demographic Characteristics of the respondents (n=165).

Variables	Yes (%)	No (%)	I don't know (%)
Have you ever heard about malaria in pregnancy	157 (95.2%)	6 (3.6%)	2 (1.2%)
Malaria in pregnancy is transmitted by mosquito	153 (92.7%)	7 (4.2%)	5 (3.0%)
Malaria can kill if it is not treated	141 (85.5%)	20 (12.1%)	4 (2.4%)
Have you ever experienced malaria in pregnancy	105 (63.3%)	53 (32.1%)	7 (4.2%)
Malaria in pregnancy can be prevented	149 (90.3%)	12 (7.3%)	4 (2.4%)
Malaria in pregnancy can lead to spontaneous abortion	127 (77.0%)	29 (17.6%)	9 (5.5%)
Malaria in pregnancy can lead to premature delivery	135 (81.8%)	22 (13.9%)	8 (4.8%)
Malaria in pregnancy can lead to low birth weight of a baby	137 (83.0%)	20 (12.1%)	8 (4.8%)
Malaria in pregnancy can lead to maternal death or anaemia	133 (80.6%)	23 (13.9%)	9 (5.5%)
The use of mosquito treated nets (ITNs) prevents malaria during and after pregnancy	151 (91.5%)	9 (5.5%)	5 (3.0%)
The use of IPT (SP) malaria drugs during pregnancy reduces the incidence of low birth weight (LBW)	137 (83.0%)	16 (9.7%)	12 (7.3%)
The use of IPT (SP) malaria drugs during pregnancy reduces maternal anaemia	137 (83.0%)	17 (10.3%)	11 (6.7%)
The use of IPT (SP) malaria drugs during pregnancy prevents spontaneous abortion	134 (81.2%)	19 (11.5%)	12 (7.3%)

Table 2: Knowledge of Malaria in Pregnancy (n=165) (SA: Strongly Agree, A: Agree, U: Undecided, D: Disagree, SD: Strongly Disagree).

Variables	SA (%)	A (%)	U (%)	D (%)	SD (%)
Malaria is a serious and life -threatening disease	74 (44.8%)	38 (23.0%)	2 (1.2%)	4 (2.4%)	2 (1.2%)
Malaria can be transmitted from one person to another like the common cold	52 (31.5%)	49 (29.7%)	4 (2.4%)	28 (17.0%)	32 (19.4%)
The best way to prevent myself getting Malaria is to avoid getting mosquito bites	85 (51.5%)	60 (36.4%)	8 (4.8%)	10 (6.1%)	2 (1.2%)
Sleeping under a mosquito net during the night is one way to prevent myself getting Malaria during pregnancy	89 (53.9%)	66 (40.0%)	2 (1.2%)	7 (4.2%)	1(0.6%)
I feel I can treat myself if I get Malaria during pregnancy	73 (44.2%)	61 (37.0%)	7 (4.2%)	13 (7.9%)	11 (6.7%)
Only children and pregnant women are at risk of Malaria	64 (38.8%)	47 (28.5%)	8 (4.8%)	26 (15.8%)	20 (12.1%)
One can recover spontaneously from Malaria in pregnancy without any treatment	50 (30.3%)	36 (21.8%)	8 (4.8%)	36 (21.8%)	35 (21.2%)
If someone has malaria, people should avoid having close contact with him/her	48 (29.1%)	32 (19.4%)	4 (2.4%)	43 (26.1%)	38 (23.0%)
It is dangerous when Malaria medicine is not taken completely during pregnancy	83 (50.3%)	63 (38.2%)	4 (2.4%)	11 (6.7%)	4 (2.4%)
I can't buy anti-Malaria drugs from the drug shop/pharmacy to treat myself when I get Malaria during pregnancy	60 (36.4%)	41(24.8%)	3 (1.8%)	37 (22.4%)	24 (14.5%)
I should go to the health centre/clinic to have my blood tested as soon as I suspect that I have Malaria during pregnancy	104 (63.0%)	55 (33.3%)	2 (1.2%)	3 (1.8%)	1 (0.6%)
I will seek for advice or treatment when I get Malaria	92 (55.8%)	65 (39.4%)	2 (1.2%)	2 (1.2%)	4 (2.4%)

Table 3: Attitudes towards Malaria in Pregnancy (n=165), (SA: Strongly Agree, A: Agree, U: Undecided, D: Disagree, SD: Strongly Disagree).

Variables	SA (%)	A (%)	U (%)	D (%)	SD (%)
Environmental sanitation reduces malaria in pregnancy	98 (59.4%)	58 (35.2%)	6 (3.6%)	3 (1.8%)	0 (0.0%)
Antenatal clinics help in early detection of malaria in pregnancy	99 (60.0%)	60 (36.4%)	2 (1.2%)	4 (2.4%)	0 (0.0%)
Malaria test during pregnancy is essential for detecting malaria in pregnancy	100 (60.6%)	57 (34.5%)	3 (1.8%)	1 (0.6%)	4 (2.4%)
The use of herbs (agbo) can prevent malaria during pregnancy	58 (35.2%)	57 (34.5%)	15 (9.1%)	22 (13.3%)	13 (7.9%)

Receiving IPT drugs in the 3 trimesters during pregnancy helps to prevent complications of malaria in pregnancy	84 (50.9%)	61 (37.0%)	10 (6.1%)	5 (3.0%)	5 (3.0%)
Counselling on malaria in pregnancy is one of the ways to reduces malaria in pregnancy	80 (48.5%)	66 (40.0%)	6 (3.6%)	10 (6.1%)	3 (1.8%)
Regularly clearing the bushes reduces the incidence of malaria in pregnancy	77 (46.7%)	75 (45.5%)	4 (2.4%)	6 (3.6%)	3 (1.8%)
On time antenatal register is important in preventing the complications of malaria in pregnancy	80 (48.5%)	69 (41.8%)	7 (4.2%)	5 (3.0%)	4 (2.4%)
It is very important to check for an expiry date of the drug before taking it	106 (64.2%)	51 (30.9%)	3 (1.8%)	3 (1.8%)	2 (1.2%)
Clearing of improper waste around your house prevents malaria in pregnancy	89 (53.9%)	67 (40.6%)	5 (3.0%)	2 (1.2%)	2 (1.2%)
Draining stagnant water around your house prevents malaria in pregnancy	85 (51.5%)	65 (39.4%)	5 (3.0%)	4 (2.4%)	6 (3.6%)
Use of Long Lasting Insecticide Treated Nets (LLITNs) help prevents malaria in pregnancy	76 (46.1%)	73 (44.2%)	10 (6.1%)	4 (2.4%)	2 (1.2%)
Indoor Residual Spray (IRS) e.g. Raid, Baygon is harmful for preventing malaria during pregnancy	71 (43.0%)	62 (37.6%)	14 (8.5%)	9 (5.5%)	9 (5.5%)

Table 4: Perceptions of Malaria in Pregnancy (n=165), (SA: Strongly Agree, A: Agree, U: Undecided, D: Disagree, SD: Strongly Disagree).

Variables	Have you ever heard about malaria in pregnancy		X ²	P-value	Remarks
	Good (%)	Poor (%)			
Age groups (in years)	-	-	-	-	-
16-25	38 (24.20%)	3 (37.50%)	-	-	-
26-35	106 (64.24%)	3 (37.50%)	21.461	0.001	SS
36-45	13 (7.88%)	2 (25.00%)	-	-	-
Total	157 (100%)	8 (100%)	-	-	-
Level of education	-	-	-	-	-
Primary	4 (2.55%)	1 (12.50%)	-	-	-
Secondary	81 (51.59%)	6 (75.00%)	22.535	0	SS
Tertiary	72 (45.86%)	1 (12.50%)	-	-	-
Total	157 (100%)	8 (100%)	-	-	-
Note: *SS: Statistically Significant, NSS: Not Statistically Significant. *Significant relationship at value less than 0.005.					

Table 5: Relationship between Socio-Demographic Characteristics and Knowledge of Malaria in Pregnancy.

Variables	To prevent myself from getting malaria is to avoid getting mosquito bites		X ²	P-value	Remarks
	Positive	Negative			
	(%)	(%)			
Age groups (in years)	-	-	-	-	-
16-25	37 (25.52%)	4 (20.00%)	-	-	-
26-35	98 (67.59%)	11 (55.00%)	17.365	0.004	SS
36-45	10 (6.89%)	5 (25.00%)	-	-	-
Total	145 (100%)	20 (100%)	-	-	-
Note: *SS: Statistically Significant, NSS: Not Statistically Significant. *Significant relationship at value less than 0.005.					

Table 6: Relationship between Socio-Demographic Characteristics and Attitudes towards Malaria in Pregnancy (n=165).

Variables	Use of herbs (agbo) can prevent malaria during pregnancy		X ²	P-value	Remarks
	Good (%)	Poor (%)			
Age groups (in years)	-	-	-	-	-
16 – 25	30 (26.09%)	11 (22.00%)	-	-	-
26 – 35	76 (66.09%)	33 (66.00%)	17.526	0.004	SS
36 – 45	9 (7.83%)	6 (12.00%)	-	-	-
Total	115 (100%)	50 (100%)	-	-	-
Hospital/health centre name	-	-	-	-	-
State Specialist Hospital	54 (46.96%)	41 (82.00%)	17.52	0	SS
Comprehensive Health centre	61 (53.04%)	9 (18.00%)	-	-	-
Total	115 (100%)	50 (100%)	-	-	-
Note: *SS: Statistically Significant, NSS: Not Statistically Significant. *Significant relationship at value less than 0.005.					

Table 7: Relationship between Socio-Demographic Characteristics and Perceptions of Malaria in Pregnancy.

Discussion

Socio-Demographic Characteristics of the Respondents

The respondents' ages were between 16-45 years and their mean age is 28.6±5.1. 109 (66.1%) were between 26-35 years old. All the respondents 165 (100%) were females and married, 157 (95.2%) were Christians, 139 (84.2%) were Yoruba, 3 (1.8%) respectively. 135 (81.8%) have had 1-3 numbers of pregnancies/ births, 67 (40%) and 66 (40.6%) of the pregnant women are in their second and third trimesters. 79 (47.9%) earned between 10,000-30,000 monthly, 87 (52.7%) had secondary school education and 59 (35.8%) are traders and 95 (57.6%) registered at State Specialist Hospital, Okitipupa for their antenatal clinics.

A similar study was conducted in Badagry, Lagos State, Nigeria of which the age of the women ranged from 16 to 45 years, with a mean age of 29±4.3 years. The predominant ethnic was Yoruba, 277 (62%). Commonest occupation was traders, 160

(36%). Educationally, 185 (41%) had secondary education, 345 (76%) of the respondents were Christian, most of the women (95.8%) were married. Results showed that 162 (36%) and 122 (27%) of the women have 1 or 2 children, respectively. At the time of the interview, the ages of their pregnancies ranged between 8 and 38 weeks, with a mean of 28 weeks.

Knowledge of Malaria in Pregnancy

Out of the 165 respondents, 157 (95.2%) agreed that they have ever heard about malaria in pregnancy. 155 (92.7%) strongly believed that malaria is transmitted by mosquito and 141 (85.5%) agreed that it can kill if it is not treated and 105 (63.3%) have experienced malaria in pregnancy and 137 (83.0%) believed that malaria in pregnancy can leads to Low Birth Weight (LBW). 151 (91.5%) agreed that the use of mosquito nets (ITNs) prevents malaria during pregnancy, 137 (83.0%) affirmed strongly that the use of IPT (SP) malaria drugs during pregnancy helps in reducing the incidence of low birth weight (LBW) and maternal

anaemia. 134 (81.2%) believed that IPT (SP) could also prevent spontaneous abortion. The chi-square pointed out that there is a significant relationship between age ($p < 0.001$), level of education ($p < 0.000$) and the knowledge of malaria in pregnancy.

A cross-sectional survey was conducted in Uganda. It was found that the majority of the respondents 85% have ever heard about malaria. Most (80%) 571 respondents attributed malaria to be transmitted by mosquito bites. Most (91%) 683 respondents mentioned that malaria was caused by mosquito.

A study was conducted in Badagry, Lagos State. The women's understanding of malaria showed that 355 (79%) perceived malaria as a serious illness, 162 (36%) mentioned they suffered malaria once during pregnancy. The majority 380 (84.4%) who claimed to know what SP is used for said it was for treatment of malaria, SP was taken for malaria prevention during pregnancy by 337 (75%) of the women. Respondents viewed ITNs mainly as a means of protection from mosquito bites (57%) and secondly for preventing malaria (48%). On awareness of LLINs and its use, 356 (79%) were aware of LLINs [17].

Attitudes towards Malaria in Pregnancy

165 respondents, 74 (44.8%) strongly agree that malaria is a serious and life-threatening disease. 85 (51.5%) strongly agree that best way to prevent themselves from getting malaria is to avoid getting mosquito bites. Also 89 (53.9%) strongly agree that sleeping under a mosquito net during the night is one way to prevent myself getting malaria during pregnancy. 64 (38.8%) strongly agree that only children and pregnant women are at risk of malaria. 50 (30.3%) strongly agree that one can recover spontaneously from malaria in pregnancy without any treatment. Of the 165 respondents, 83 (50.3%) strongly agree that it is dangerous when malaria medicine is not taken completely during pregnancy. 60 (36.4%) strongly agree that they can buy anti-malaria drugs from the drug shop/pharmacy to treat themselves when they get malaria during pregnancy and 92 (55.8%) strongly agree that they will seek for treatment when they get malaria during pregnancy. The total percentage of the general attitudes was calculated and was found out that 98.2% of the respondents have positive attitudes towards malaria in pregnancy. The chi-square showed that there is a significant relationship between age ($p < 0.004$) and the attitudes towards malaria in pregnancy.

A study done by [19] in south-western Nigerian community indicates 95.4% of respondents looked at malaria as a severe problem that could kill. The Commercial Market Strategies (CMS) survey in districts of Ogun noted that majority of respondents (98%) believed that malaria was dangerous and could cause death. According to early diagnosis and treatment of malaria is well recognized as a strategy for reducing morbidity and mortality of the disease [20].

Perceptions of Malaria in Pregnancy

Of the 165 respondents, 98 (59.4%) strongly agree that environmental sanitation reduces malaria in pregnancy, 99 (60.0%) strongly agree that antenatal clinics help in early detection of malaria in pregnancy, 100 (60.6%) strongly agree that malaria test during pregnancy is essential for detecting malaria in pregnancy and 84 (50.9%) strongly agree that receiving IPT drugs in the 3

trimesters during pregnancy helps to prevent complications of malaria in pregnancy. 106 (64.2%) strongly agree that it is very important to check for an expiry date of the drug before taking it. 76 (46.1%) strongly agree that the use of Long Lasting Insecticide Treated Nets (LLITNs) help prevent malaria in pregnancy. The result from chi-square revealed that age ($p < 0.004$) and hospital/health centre ($p < 0.000$) where the respondent registered for antenatal clinics has a significant relationship with the perceptions of malaria in pregnancy [21].

A study was in semi-urban and rural communities (Akomoje, Iberekodo, Osiele and Sabopapamaru) of Abeokuta, Nigeria. 68% of the pregnant women utilized herbs for treating symptoms associated with malaria due to its effectiveness and suitability and not due to financial constraint or lack of access to health facility. Though most women utilized herbs, 32% relied more on the use of anti-malarial drugs. Sulfadoxine-pyrimethamine was the preferred anti-malarial drug during pregnancy at the 2nd and 3rd trimesters. In Malawi, it was found that use of herbs was common as about 51.4% of the pregnant women interviewed indicated they had used at least one type of herbal medicines during pregnancy. In Nigeria, it was found that more than two-third (67.5%) of pregnant women in study had used herbal medicines either in crude forms or as pharmaceutical pre-packaged dosage forms, with the majority (74.3%) preferring self-prepared formulations.

Conclusion

This study therefore concluded that malaria in pregnancy is a global burden which its present and future effects are very dangerous to the health of the individual (mother and the foetus in the womb), family, society and the nation at large. All efforts must be channelled towards the prevention, diagnosis, treatment and control of malaria in pregnancy so as to avert the resultant effects of malaria in pregnancy on the mother, unborn child, family, community, nation and the world at large.

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