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Low Utilization of Two Prophylactic Measures of Malaria in Pregnancy (MiP) in Some Rural Villages of Ebonyi State, Nigeria: A Clarion Call for Enlightenment and Strengthening of Maternal and Child Health.

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ABSTRACT

Malaria is a preventable and curable life-threatening public health problem that is endemic in many tropical and sub-tropical countries of the world. Pregnant women, foetuses, and infants below 5 years old have the greatest risk of malaria infections. Insecticide-treated bednets (ITNs) and intermittent preventive treatment (IPT) have been proven to be effective in the control of malaria transmission. This communication is a report of low utilizations of ITNs and intermittent preventive treatment in pregnancy with sulphadoxine-pyrimethamine (IPTp-SP) by pregnant women in some rural villages of Ebonyi State, Nigeria. Seventy-five (75) pregnant women from eight (8) rural villages in Ebonyi State participated in the study. Structured questionnaires were used to extract socio-demographic information and some pregnancy- related issues from the women after obtaining their consent. Determination of a woman's last day of menstrual flow formed a presumptive diagnosis of pregnancy and confirmation of pregnancy was based on the detection of human chorionic gonadotropin (HCG) in early morning urine specimens of the women. Data collected were analysed with the use of descriptive statistics. Age was found to be a driving force shaping the utilization of the two malaria interventions. There was a progressive increase in the Levels of utilization of both ITNs and IPTp- SP; with advancements in educational attainment. Generally, there were below average rates of utilization of both ITNs and IPTp-SP. Concerted efforts of all public health stakeholders are needed for promotion of public health awareness and implementation of scale up of intervention programme for effective global malaria control.

Keywords: Utilization, Prophylaxis, Malaria, Pregnancy, Nigeria.

INTRODUCTION

Malaria is a dreadful but preventable and treatable parasitic disease that threatens the health of people from most tropical and sub-tropical regions of the globe. It is transmitted by inoculation of the developmental stage (sporozoite) of *Plasmodiumspecies*, through infective anopheles mosquito bites. Five species of the parasite- *P. falciparum, P. malariae, P. ovale, P. vivax,* and *P. knowlesi*are incriminated in the transmission of the disease among human beings. *P. falciparum* is the most dangerous of the species.

Pregnant women, especially the primigravidae, children less than 5 years old, and immunocompromised individuals are groups of people who are mostly at greater risk of malaria infection. The outcome of malaria in pregnancy could be very poor for both mother and foetus. It can lead to maternal anaemia, which can predispose the woman to other infectious diseases and serious health complications, resulting from poor nutrition and lowered immunity, and in most cases, fatalities ensue. Malaria in pregnancy can result to premature delivery, abortion, still births, and low birth weights. The sub- Sahara Africa has been reported to have the highest rates of still births [1], with majority of the cases attributable to malaria infections. Maternal ill-health and low birth weights are significant problems associated with *P. falciparum* malaria infections in pregnancy [2] and in high malaria transmission stable areas of the world, the associated health consequences of malaria infections in pregnancy are significant among the primigravidae [2]. *P.falciparum* infection in pregnancy has been reported to be asymptomatic and to only mostly affect the primigravidae in high malaria transmission areas because of acquisition of immunity through exposure to several infective mosquito bites. The reverse of the situation is the case in low-transmission settings where women of the child-bearing age have been reported to have relatively little acquired immunity to malaria and the infection is known to affect all pregnant women irrespective of gravidities [2].

The African continent shares a great burden of malaria infections. In sub-Sahara Africa, over 15% of maternal deaths were associated with malaria infections during pregnancy and despite many currently existing malaria control strategies, malaria in pregnancy is still responsible for 400,000 cases of severe maternal anaemia, 10,000 maternal deaths and the death of 200,000 new born babies annually [3]. It has been reportedly estimated that up to 50 million women worldwide annually become pregnant [2]. Paradoxically, more than 50% of them live in Africa. Nigeria is among the African countries that share the burden of malaria infections. It has been reported that malaria accounts for 60% of outpatient visits to health facilities, 30% of childhood deaths, 25% of deaths in children below one year, and 11% maternal deaths in Nigeria [4].

The ravaging effect of malaria in pregnancy spurred researchers into introducing and adopting the use of insecticide-treated bednets and intermittent preventive treatment in pregnancy with sulphadoxinepyrimethamine (IPTp-SP). People, especially pregnant women and infants were instructed to be sleeping under bednets that have been impregnated with long-lasting insecticides. Intermittent preventive treatment of malaria in pregnancy is a full therapeutic course of anti-malaria drugs administered to pregnant women at routine antenatal visits, regardless of whether the recipient is infected with malaria or not [2]. Intermittent preventive treatment of malaria in pregnancy reduces the health risks associated with malaria in pregnancy including maternal malaria episodes, maternal and foetal anaemia, placental parasitaemia, low birth weight, and neonatal mortality.

In 2012, the World Health Organisation recommended IPTp-SP for all women living in areas with moderate-to-high malaria transmission at each scheduled antenatal care visit. The guidelines include among others, that the first IPTp-SP dose should be administered during the 2nd trimester and not at the first trimester and that SP should not be administered to pregnant women under treatment with co-trimoxazole [2].

The use of intermittent preventive treatment in pregnancy (IPTiP) has long been in operation in Nigeria. In fact, intermittent treatment with sulphadoxine- pyrimethamine (IPT-SP) was adopted as national policy in Nigeria in the year 2000 [5] and it has been implemented in all health facilities, though at skeletal levels in some facilities, resulting in low utilization of the programme. This communication is a report of low utilization of two malaria preventive measures in pregnancy (IPTp-SP and ITNs) in some rural villages of Ebonyi State, Nigeria. The information is for re-awakening of public health

enlightenment and strengthening of the fight against malaria, for achievable improvement on maternal and child health in Nigeria.

Materials and Methods

Study Area: The study was carried out in eight villages of Ebonyi State, Nigeria. Ebonyi State is one of the southeastern states of Nigeria. The state lies approximately within longitude $7^{0}30^{I}$ and $8^{0}30^{I}$E and latitude $5^{0}40^{I}$ and $6^{0}45^{I}$N [6]; [7]. The vegetation of the state is dominated by tropical rainforest and it has two seasons-dry and wet. The average temperature and relative humidity values of the state are approximately 75% and between 27 ^{0}C and 30 ^{0}C respectively [8].

The Study Population: The study population is pregnant women who were either attending or not attending the local health facilities for antenatal visits.

Inclusion and Exclusion Criteria: The women were allowed to participate in the exercise if they were confirmed to be pregnant. The non- pregnant ones were dismissed.

Ethical Considerations: Approval for the study was obtained from the local primary health authorities of the area and informed consents were obtained from the participants before the urine samples were collected from and questionnaires administered to them respectively. Complete ethical precepts were observed.

Questionnaire Administration: Structured close ended questionnaires were administered to 75 women confirmed to be pregnant, after they had consented to participate in the exercise. Information on socio-demographics and pregnancy-related issues with respect to the use of ITNs and IPTp-SP formed the greatest component of the questionnaires. Local dialects were employed in the extraction of information on the questionnaire for the illiterate women. Thereafter, the questionnaires were retrieved for collation and onward analysis.

Specimen Collection and Laboratory Analysis: Urine specimen containers were distributed to each of the participants on the eve of the collection date. The women were instructed to collect the first urine in the morning when they wake up from sleep. Proper urine collection demonstrations were made for them. Samples of the urine specimen were collected from the women in their respective residences on the following day and were urgently sent to the laboratory for analysis. A woman was tentatively regarded as being pregnant if after being interviewed, it was ascertained that her last day of menstruation was up to one (1) month or more. Pregnancy was confirmed by the detection of human chorionic gonadotropin (HCG) in early morning urine specimens of the women, using dipstick test method as outlined by [9].

Data Analysis: Data generated were analysed using sample descriptive statistical methods.

RESULTS

The socio-demographics of the participants are depicted in table 1. The age of the participants ranged from 16 years to 45 years, with age group 16-20 years forming the greatest percentage (29.33%) of the participants. Educational qualifications of the pregnant women indicated that 35(46.67%) had no formal education while 3(4.00%) attended tertiary institutions.

The secondigravidae had the highest number of participants (32), forming 42.67% of the total number of the women while the multigrvidae were least (15), with 20.00%. Pregnant women who were in their second trimesters formed 48.00% of the population while those in their first trimesters formed 22.67%.

Table 1: Socio- demographics of pregnant women in some rural villages of Ebonyi State, Nigeria

Parameters	Number of Participants	Percentage
Age groups (years)		
16-20	22	29.33
21-25	11	14.67
26-30	15	20.00
31-35	14	18.67
36-40	10	13.33
41-45	3	4.00
Total	**75**	**100.00**
Educational Qualifications		
No formal education	35	46.67
Primary education	24	32.00
Secondary education	13	17.33
Tertiary education	03	4.00
Total	**75**	**100.00**
Gravidity		
Primigravidae	28	37.33
Secondigravidae	32	42.67
Multigravidae	15	20.00
Total	**75**	**100.00**
Trimesters		
First	17	22.67
Second	36	48.00
Third	22	29.33
Total	**75**	**100.00**

Table 2 depicts age- dependent utilization of the two malaria intervention measures. Women who were 41-45 years old did not utilize any of the two measures while those who were within the age group of 21-25 years made more use of them. ITNs (45.45%) were utilized more than the IPTp-SP (36.36%) by women within that age group. In addition, there was an overall more use of ITNs (22.67%) than the IPTp-SP (16.00%).

Table 2: Age-dependent utilization of ITNs and IPTp-SP by pregnant women in some rural villages in Ebonyi State, Nigeria

Age Group (years)	Number Interviewed	ITNs Utilization (%)	IPTp-SP Utilization (%)
16-20	22	4(18.18)	3(13.64)
21-25	11	5(45.45)	4(36.36)
26-30	15	3(20.00)	2(13.33)
31-35	14	3(21.43)	2(14.29)
36-40	10	2(20.00)	1(10.00)
41-45	3	0(0.00)	0(0.00)
Total	**75**	**17(22.67)**	**12(16.00)**

There was a progressive increase in the level of utilization of both ITNs and IPTp-SP, with advancement in educational attainment. Women who had no formal education made the lowest use of both preventive measures while the highest utilization of them was achieved by women who attended tertiary institutions. However, there was an overall difference in the utilization of the two preventive approaches, with ITNs,18 (24.00%) being more utilized than the IPTp-SP, 11(14.67%) (Table 3).

Table 3: Educational qualification-dependent utilization of ITNs and IPTp-SP by pregnant women in some rural villages of Ebonyi State, Nigeria

Educational Qualifications	Number Interviewed	ITNs Utilization (%)	IPTp-SP Utilization (%)
No formal education	35	4(11.43)	2(5.71)
Primary education	24	7(29.17)	4(16.67)
Secondary education	13	5(38.46)	4(30.77)
Tertiary education	03	2(66.67)	1(33.33)
Total	**75**	**18(24.00)**	**11(14.67)**

Insecticide-treated bednets were utilized more (28.13%) by the secondigravidae while IPTp-SP was used more (46.43%) by the primigravidae. Overall, the use of IPTp-SP was higher than that of ITNs (Table 4).

Table 4: Gravidity-dependent utilization of ITNs and IPTp-SP by pregnant women in some rural villages of Ebonyi State, Nigeria

Gravidity	Number Interviewed	ITNs Utilization (%)	IPTp-SP utilization (%)
Primigravidae	28	6(21.43)	13(46.43)
Secondigravidae	32	9(28.13)	7(21.88)
Multigravidae	15	2(13.33)	1(6.67)
Total	**75**	**17(22.67)**	**21(28.00)**

Table 5 depicts trimester-based utilization of ITNs and IPTp-SP by the participating women. Women whose pregnancies had progressed to the second trimesters utilized the two interventions more than others but those who were in their first trimesters made 35.29% use of the ITNs, while no utilization was made of the IPTp-SP. However, there was an overall more use of the ITNs than IPTp-SP.

Table 5: Trimester-dependent utilization of ITNs and IPTp-SP by pregnant women in some rural villages of Ebonyi State, Nigeria

Trimesters	Number Interviewed	ITNs Utilization (%)	IPTp-SP Utilization (%)
1st	17	6(35.29)	0(0.00)
2nd	36	17(47.22)	13(36.11)
3rd	22	3(13.64)	6(27.27)
Total	**75**	**26(34.67)**	**19(25.33)**

DISCUSSION

The study was a cross-sectional exercise carried out to determine the levels of utilization of ITNs and IPTp-SP as intervention strategies against malaria transmission during pregnancy in eight (8) rural villages of Ebonyi State, Nigeria in June, 2015. A total of 75 pregnant women whose ages ranged from 16-45 years participated in the study. Information on utilization of the preventive measures was related to the ages, educational qualifications, gravidities and trimesters of the pregnant women.

Utilizations of the two malaria preventive measures were found to be dependent on age. The youngest age group of the study participants (16-20 years) minimally utilized the interventions, while the oldest age group (41-45 years) did not use any of the two approaches at all. However, in-between the two extreme age groups, was observed relatively higher utilizations of the interventions, with women in the age group of 21-25 years, making the highest though still below average use of both ITNs and IPTp-SP.

The observed differences in age with respect to the use of the two preventive measures could be attributed to the fact that the younger women might have not been informed effectively that these malaria preventive measures could be helpful, useful and safe for them during pregnancy, as many of them were primigrvidae. Apart from age, some other demographic factors, such as gender, wealth and education have been reported to be important predictors in the use of the intervention measures [10]; [11]. [12] and [13]. reported low awareness of the importance of insecticide-treated bednets in the control of malaria as one the reasons for their low utilizations. This emphasises the importance of effective health information at the antenatal clinic (ANC) levels. This fact has been reportedly-stressed by [14], who emphasised that information from health facilities are bound to be clearer and more authoritative as opposed to that from other sources such as community based health workers, who might have acquired minimal training for their work.

The utilization of ITNs and IPTp- SP rapidly increased with advancement in educational status. This observation has been reported by earlier studies such as those of [10], [6], [11] and [15].

The secondigravidae utilized the ITNs better than the other gravidities while the primigravidae made better use of the IPTp-SP. However, overall utilization indicated that IPTp-SP was better utilized than ITNs even though both of them were under-utilized. The better utilization of IPTp-SP in comparison with that of ITNs could be attributed to the direct observed therapy being implemented at the antenatal clinics (ANC). Utilizations of ITNs have been reported not to depend on their possession as many owners of ITNs rarely use them [16]. Many reasons including generation of heat, feeling of being suffocated, and being allergic to the impregnated insecticide have been given by bednet owners for discouraging their use.

Across all the parameters investigated for utilization of both ITNs and IPTp-SP, there were indications of low utilizations of the prophylactic measures. Several previous scholars have reported such low use of the interventions. [17] reported 15% utilization of ITNs in Abeokuta, Nigeria. [18] reported a low utilization rate of 28.91% in Ebonyi State, Nigeria while [17] reported an underutilization rate of 39.1% in Enugu, Nigeria. [5], reported 20% and 18.5% utilization rates for ITNs and IPTp-SP respectively in Ibadan, Nigeria while [18] also reported a low utilization rate of 19.5% for IPTp-SP in Umunya, Anambara State, Nigeria.

CONCLUSION

Utilizations of both ITNs and IPTp-SP could be highly influenced by the perception of the people of communities where the study is conducted. Many rural dwellers do not believe that their uses can prevent malaria episodes. This disbelief has been reported by Serengbe et al. (2015). The findings of this study have indicated under utilizations of both ITNs and IPTp-SP across age groups, educational levels, gravidities and trimesters. The under utilization could be highly attributed to low and ineffective levels of dissemination of health information to the public. Concerted efforts of the village health workers, public health officers, medical doctors, academics, teachers, all stakeholders in public health and most important, the nurses at the antenatal clinics (ANC) in all health sectors, including primary, secondary and tertiary, are needed to effectively scale-up the utilization of these interventions for effective control of malaria as a global public health problem.

REFERENCES

1. Wort, U.U., Hastings, I., Mutabingwa, T.K. and Brabin, B. (2006). The impact of endemic and epidemic malaria on the risk of still birth in two areas of Tanzania with different malaria transmission patterns. *Malaria Journal*, 5:89. *http*://www.malariajournal.com.
2. World Health Organisation (2015). *Guidelines for the Treatment of malaria*. Third edition.

3. Menendez, C. (2015). Intermittent Preventive Therapy, a Key Tool to Prevent and Control Malaria in Pregnancy. Malaria in Pregnancy: Intermittent Preventive Treatment Fact Sheet.
4. National Malaria Control Programme (2015). Federal Ministry of Health, Abuja.
5. Tongo, O. O., Orimadegun, A. E. and Akinyinka, O.O. (2011). Utilization of malaria preventive measures during pregnancy and birth outcomes in Ibadan, Nigeria. BMC Pregnancy and Childbirth, 11:60--66.
6. Uneke, C. J and Ibeh, L.M. (2009). Impact of deforestation on malaria in Southeastern Nigeria: the epidemiological, socioeconomic and ecological implications. *The Internet Journal of the Third World Medicine*, 8(1):3-9.
7. Ogbodo, E.N. (2013). Assessment and management strategies for the receding watersheds of Ebonyi State, Southeast Nigeria. *Journal of Environment and Earth Sciences*, 3(3):18-26.
8. Federal Department of Agriculture and Land Resources(1985).The Reconnaissance Soil Survey of Anambra State Soil Report, Lagos, Nigeria.
9. Fischbach, F.(2000). A*Manual of Laboratory and Diagnostic Tests*. Sixth Edition. Lippincott, Philadelphia, USA.
10. Macintyre, K., Keating, J., Okbaldt,Y.B., Zerom, M., Sosler, S., Ghebremeskel, T. (2006). Rolling out insecticide-treated nets in Eritrea: examining the determinants of possession and use in malaria zones during the rainy season. *Tropical Medicine and International Health*, 11:824-833.
11. Auta, A. (2012). Demographic factors associated with insecticide-treated bed net use among Nigeria women and children. North American Journal of Medical Science, 4(1): 40-44.
12. Nganda, R.Y., Drakeley, C., Reyburn, H. and Merchant, T. (2004). Knowledge of malaria influences the use of insecticide-treated nets but not intermittent presumptive treatment by pregnant women in Tanzania. *Malaria Journal*, 12(3): 42-47.
13. Eyobo, M.B., Awur, A.C., Wani, G., Julla, A.I., Remio, C.D., Sebit, B., Azairwe, R., Thabo, O., Bepo, E., Lako, R.L., Riek, L. and Chanda, E. (2014). Malaria Indicator Survey 2009, South Sudan: baseline results at household level. *Malaria Journal,* 13:45.doi:10.1186/1475-2875-13-45.
14. Mutulei, A.C.N. (2013). Factors influencing the uptake of intermittent preventive treatments for malaria in pregnancy: evidence from Bungoma East District, Kenya. *American Journal of Public Health Research*, 1(5): 110-123.
15. Ouma, P.O., VanEjik, A.M., Hamel, M.J., Sikuku, E., Odhiambo, F., Munguti, K., Ayisi, J.G., Kager, P.A. and Slutsker, L.(2007).The effect of healthcare worker training on the use of intermittent preventive treatment for malaria in pregnancy in rural Western Kenya. *Tropical Medicine and International Health*, 12(8): 953-961.
16. Ugwu, E.O., Ezechukwu, P.C., Obi, S.N., Ugwu, A.O. and Okeke,T.C. (2013). Utilization of insecticide-treated nets among pregnant women in Enugu, Southeastern Nigeria. *Nigerian Journal of Clinical Practice*, 16(3): 292-296.
17. Elom, M.O., Alo, M.N., Ugah, U.I., Okeh, E.N. and Ibiam, G.A. (2013). A survey of utilization and effectiveness of insecticide-treated bednets (ITNs) as intervention strategy in malaria transmission among pregnant women in rural communities in Ebonyi State, South Eastern Nigeria. *IOSR Journal of Dental and Medical Sciences*, 9(2): 60-64.
18. Sam-wobo, S.O., Akinboroye, T., Anosike, J.C. and Adewale, B. (2008). Knowledge and practices on malaria treatment measures among pregnant women in Abeokuta, Nigeria. *Tanzania Journal of Health Sciences*, 10(4): 226-231.