



Scholars Research Library

Archives of Applied Science Research, 2016, 8 (7):27-30
(<http://scholarsresearchlibrary.com/archive.html>)



Compliance to Intermittent Preventive Treatment and Malaria Incidence Rates among Pregnant Women in Yenagoa, Bayelsa State, Nigeria

Amawulu Ebenezer¹ and Catherine Jonathan²

¹Department of Biology, Isaac Jasper Boro College of Education, Sagbama, Bayelsa State

²Department of Community Health, Ministry of Health, Bayelsa State

ABSTRACT

Intermittent preventive treatment and drug compliance are two important components in malaria control among pregnant women. This study was undertaken during October, 2014 - March, 2015 to determine the incidence rates of malaria among pregnant women in relation to drug compliance. A total of 4642 pregnant women attending outpatient department in Federal Medical Centre (FMC), Yenagoa were recruited upon consent. Two brands of drugs; sulfadoxine (200mg) and pyrimethamine (250mg) were obtained and shared to the pregnant women based on WHO recommendations. The pregnant women were instructed to take the drugs during the 16 weeks of pregnancy and also at the end of the second trimester on supervision by the attendant nurse. Two millilitres (2ml) of intravenous blood was taken from each of the women during the first week of the third trimester. A thin and thick blood film was made in a grease-free slide. Slides preparation and estimation of malaria positive slides followed standard procedures. The percentage recruitment of the pregnant women in 2014 and 2015 were 46.7% and 53.3% respectively. Out of the total recruit, 52.3% did not accept taking any drug, 32.5% took one dose and 9.5% took complete doses. Malaria incidence rates among those that did not take the drugs, those that took only one dose and those that completed their doses were 95.3%, 38.1% and 31.0% respectively. Differences were statistically significant ($\chi^2 c=15.27$; $df=2$; $p<0.05$). The incidence rates decrease with increase in age and showed similar trend in all the compliance level. Differences were statistically significant ($\chi^2 c=56.77$; $df=6$; $p<0.05$). Not all the malaria parasites were cleared in all the compliance levels. This highlighted that sulfadoxine and pyrimethamine were malaria preventive drugs and not a potent curative drugs in pregnant women.

Keywords: Malaria, compliance, preventive treatment, pregnant women, Yenagoa.

INTRODUCTION

Malaria is a public health problem in Africa and account for > 310-315 million clinical cases and 1.5-3.0 million deaths every year [1]. Pregnant women and children < 5 years are the most affected [2].

Malaria during pregnancy are the major causes of > 10,000 maternal death in Africa [3], premature labor and small – to – date babies [4], low birth weight [5] and infant death [6]. In Nigeria alone, > 48% of pregnant women has been diagnosed of malaria annually [7].

The World Health Organization has recommended the intake of sulfadoxine pyrimethamine as routine drugs for malaria treatment in pregnant women before delivery [8]. The compliance level and intake of correct dosages are the

basic pre-requisite for monitoring the effectiveness of the drugs during pregnancy in different parts of the world [9-11]. There is paucity of information on the drugs intake and compliance level in Bayelsa State. This study therefore provides base line information on the compliance level to anti-malaria drugs and malaria infection among pregnant women in Yenagoa, Bayelsa State.

MATERIALS AND METHODS

Study Area: The study was conducted at the antenatal department of the Federal Medical Centre (FMC), Yenagoa, Bayelsa – State (5° 21'-6°45'E and 4°15'-5°23'N) during September, 2014 to August, 2015. Federal Medical Centre is located in the heart of Yenagoa (4°53'N and 5°17'E), the capital of Bayelsa State.

Ethnical consideration: Permission for the study was given by the director, outpatient department, FMC. Consent from the pregnant women was also sought for after clear explanation on the purpose of the study.

Drugs Collection and Administration: A total of 4,642 consented pregnant women presented at the outpatient department between October, 2014 and March, 2015 were recruited for the study. Proper addresses of each volunteer were taken for a follow up. A general prescription script was written by the attendant doctor for each volunteer. The same were used to obtain the drugs from the Hospital pharmacy. The brand of the anti-malaria drug used were sulfadoxine pyrimethamine, marketed as fansidar^(R) and Amak^(R). A sachet of the drugs containing 200mg of sulfadoxine and 25mg of pyrimethamine were taken as a single dose. The recruited women were asked to take the drugs under the supervision of the nurse. First dose was taken at 16 weeks of pregnancy while the second dose was taken at the end of the second trimester. Patients were advice to report any cases of reaction.

Collection and Preparation of blood samples: Two milliliters (2ml) of intravenous blood was collected from each volunteer and transferred into an EDTA bottle. A thin and thick blood films were prepared in a grease-free slides. The staining of the prepared slides and the estimation of positive malaria slides followed standard procedures [12, 13]. The parasite density of the positive slide was determined according to the method in Parise *et al.*[14].The malaria test was run once for each registered member at the beginning of the third trimester.

Data Analyses: The parasite density (PD) was analyzed using the formula:

$$P.D = \frac{\text{Number of parasitized cell}}{\text{Number of RBC in 50 field}} \times \frac{100}{1}$$

The relationship between malaria infection and the level of compliance was assessed using ANOVA at 0.05 level of confidence.

RESULTS

Four thousand, six hundred and forty two (4642) pregnant women recruited during October, 2014-March, 2015 were given the anti malaria drugs. Fifty two point three(52.3%) percent of the total recruited pregnant women showed phobia to the drug and did not take any dose while 32.5% and 9.5% of the pregnant women took one dose or complete doses respectively (Table 1).

The incidence rates of malaria among the pregnant women decreases with increase in the level of compliance to the anti-malaria drugs. The incidence rates of malaria among those that did not take any dose, those that took one dose and those that took complete doses were 95.3%, 38.1% and 31.0% respectively. The differences in the malaria incidence rates by level of compliance level was significant ($\chi^2 = 15.27$; df= 2; $p < 0.05$)(Table 2). When the malaria incidence rates by level of compliance were pooled by age, the incidence rates decreased as the age of the pregnant women increases. Differences in the age specific trends of the malaria incidence was significant Differences were statistically significant ($\chi^2 c = 56.77$; df=6; $p < 0.05$) (Table 3). Similar trend was observed in all the compliance level for the two years.

Table 1: Total number of the recruited pregnant women

| Year | Total No. recruited | % | No of pregnant women by compliance level | | |
|--------------|---------------------|--------------|--|-------------|------------|
| | | | 0 | 1 | 2 |
| 2014 | 2143 | 46.7 | 1020 | 709 | 414 |
| 2015 | 2499 | 53.3 | 410 | 800 | 289 |
| Total | 4642 | 100.0 | 2430 | 1509 | 443 |
| % | | | 52.3 | 32.5 | 9.5 |

Table 2: Malaria incidence rates by the level of compliance during 2010 – 2011

| Year | No. of pregnant women by compliance level | | | No. (%) Malaria positive among compliance level | | |
|-----------------|---|-------------|------------|---|------------------|------------------|
| | 0 | 1 | 2 | 0 | 1 | 2 |
| 2014 | 1020 | 709 | 414 | 649(63.6) | 275(38.8) | 56(13.5) |
| 2015 | 140 | 800 | 289 | 1030(73.0) | 300(37.5) | 80(27.7) |
| Both yrs | 2430 | 1509 | 443 | 2315(95.3) | 575(38.1) | 136(30.7) |

Table 3: Pooled Age-Specific Malaria incidence rates by compliance level

| Age | No. recruited (2014-2015 pooled) | No. (%) malaria incidence rates by compliance level | | |
|-------|----------------------------------|---|-----------|----------|
| | | 0 | 1 | 2 |
| 15-24 | 1786 | 564(31.6) | 538(20.6) | 155(8.7) |
| 25-34 | 1794 | 611(34.1) | 349(19.5) | 85(4.7) |
| 35-44 | 872 | 141(16.2) | 69(7.9) | 18(2.1) |
| >45 | 190 | 21(11.1) | 08(4.2) | 01(0.5) |

DISCUSSION

The compliance level of the pregnant women to anti malaria drugs in Bayelsa State was low. The low compliance level highlighted the side effect related phobia perceived by most pregnant women [15]. The effect became more pronounced among the pregnant women who were in their first trimester [10, 16]. Half of the pregnant women showed phobia to the drug, two-third part of only took one dose while One-quarter took complete doses. Reasons for these differential observations were not established in this study.

A similar age-specific trend in the malaria incidence by the level of compliance highlighted the importance of humoral immunity [17]. This could possibly be the reason why pregnant women at age > 45 years in this study have shown higher incidence rates than other subjects. The malaria incidence rates and level of compliance to the drugs were comparable. This correlation is an indication that the drug has suppressive effects on malaria parasitaemia[18]. However, malaria parasites were observed both among the pregnant women who either took any of the anti malaria or completed their doses, but the level of parasitaemia were not comparable with did not take any dose at all. This observation highlighted the importance of correct and complete doses in malaria control. Correct doses, seems to have improved the half life of the drugs [19, 20]. Despite the efficacy of the drugs, the pregnant women who both completed their doses and those who did not take any doses at all still showed some level of malaria parasitaemia. This observation had been associated with the inability of the drugs to give complete clearance to the parasitaemia or they may have only inhabited the parasites for further parasitaemic activities on the hosts' cell[20] Sulfadoxine pyrimethamine may rather be a suppressive drug than curative against malaria parasite.

CONCLUSION

Reduction in the malaria parasitaemia among pregnant women who completed their doses of the anti-malaria drug highlighted the importance of following the correct prescriptions by the Health care giver. The suppressive effect of sulfadoxine pyrimethamine rather than giving total clearance of the malaria parasitaemia in pregnant women have also undermined the drug as a drug of choice to confer protection against malaria parasitaemia during pregnancy. Their intake should be encouraged among pregnant women.

Acknowledgement

The approval of the director, outpatient department of the Federal Medical Centre for this study is appreciated. We also acknowledge the kind acceptance of the pregnant women who served as the sample population for this study.

REFERENCES

- [1] UNICEF, 2002, Malaria prevention and treatment, the prescribe, January, **2010** UNICEF, New York.
- [2] K.B.A.Marielle, F.T.C. Danisa, M.M. Modeste, K. Eric, B.M. Pierre, M. Elie, K. Maryrome, *Malaria Journal*, **2003**, 2,1-17
- [3] E. Savage, K. Myamboza, S. Gies, S. D' Alessandro, *Biomedical Journal of obstetric and Gynecology*, **2007**, 114, 1222-1231.
- [4] C.O. Falade, B.O. Yusuf, F.F. Fadero, D.A. Mokolu, D.H.Hamer, and L.A.Salako, *Malaria Journal*, **2007**,6:88.
- [5]RBM., Facts about malaria in Nigeria, Abuja. *Publication of the Roll Back malaria*, **2005**, 1-2
- [6] R.W.Steketee, B. Nahlen, M.Parise, and C. Menedez, *Am. J. Trop. Med. Hyg.* **2001**, 64:28-35
- [7] FMH, Malaria desk situation Analysis Federal Ministry of Health, *Publication of federal ministry of Health*, Nigeria, **2005**. PP 27.
- [8] FMOH, National guidelines and strategies for malaria prevention and control during pregnancy, Malaria control programme, Abuja, *A publication of the Federal ministry of Health*. Nigeria, **2005**
- [9] T.H.Holtz, S.P. Kachur, J.M. Roberts, L.H. Marum, C. Mkandala, N. Chizani, A. Macheso, M.E. Parise, *J. Health Pipul NUTR*, **2004**. 20, 1, 93-95 Blantyre District.
- [10] A. Launiala, and M.L.Honkabolo, Ethnographic study of factors influencing compliance to intermittent preventive treatment of malaria during pregnancy among yao women in rural Malawi, *Trans. R. soc. trop. Med. and Hy*, **2007**, 101, 980-989.
- [11] S.D.Tarimo, *East Afr. J. Public Health*, **2007**, 4, 80-83
- [12] World Health Organisation, 2003, Malaria Entomology and vector control, Learners guide trial Edn, WHO/CPS/CPE/SMT/**2002** 18 Rev. 1 Part 1; PP 55-58
- [13]A. Ebenezer, M.A.E. Noutcha, P.I. Agi, S.N. Okiwelu, C. Thomas, *Parasites and Vectors*, **2014**, 7, 32
- [14] E.M. Parise, G.J. Ayisi, L.B. Nahlam, J.L. Schuttz, M.J. Roberts, A. Misore, R. Muga, J.A. Oloo, W.R. Steketee, *Am. J. Trop. Med. and Hyg*,**1998**, 59,813-822.
- [15] S.O. Akinleye, C.O Falade, and I.O Ajayi, *BMC pregnancy and childbirth*, **2009**, 9, 28.
- [16] G.M. Mubyazi, I.C.bygbjerg, P. Magnussan, O. Olsen, J. Byskov, K.S. Hausen, and P. Bloch, *Malaria Journal*, **2008**,7,135
- [17] F.O.Terkuile, D.J. Terlauw, P.A. Philips- Haward, W.A. Hawley, J.F. Friedman, S.K. Kariuki, V.P. Shi, M.S. Kolezak, A. Lal, J.M. Vulule, B.I. Nahlen, *Am. J. Trop. Med. Hyg*, **2003**, 64, 50-60.
- [18] I. Muller, S. Bogerson, G.D.L. Mola, and J.C. Reeder, *PNG Med. J.* **2008**, 51, 1-2, 12-16.
- [19] K.Kayentao, M. Kadio, R.D Newman, H. Maiga, D. Doumtabe, A. Ongoiba, D. Coulibaly, A.S. Keita, B. Maiga, M.Mungai, M.Parise, O. Doumbo, *Journal of infect. Dis.*, **2005**, 191, 109-116.
- [20] N.S. Adebayo, W.A., Oladele, A.W. Olalekan, A.R. Akintunde, *JPCS* , **2011**,3, 12-52.