ORIGINAL ARTICLE

MALARIA PARASITAEMIA AMONG HIV POSITIVE PREGNANT WOMEN ON INTERMITTENT PREVENTIVE THERAPY ATTENDING A TERTIARY HEALTH CARE CENTRE IN KANO

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ABSTRACT

Background: The use of 3 doses of intermittent preventive therapy (IPT) for malaria among HIV positive pregnant women is an ante-natal preventive measure for malaria. **Objectives:** The study is aimed at determining the prevalence of malaria parasitaemia and clinical malaria among HIV positive antenatal clinic attendees who had intermittent preventive therapy for malaria. **Materials and Methods:** This was a one year retrospective study of HIV positive pregnant women in Aminu Kano Teaching Hospital, Kano, who had antenatal care between 2nd January and 31st December, 2013. Information such as parity, gestational age at booking, number of IPT given, previous malarial treatment and results of blood smear for malarial parasites, were obtained and analysed. **Results:** A total of 1800 women had antenatal care over the study period, out of which 110 were HIV positive, giving a sero-prevalence rate of 6.1%. Up to 55.5% of them booked at gestational age of 16-20weeks. Ninety women (81.8%) had 3 doses of sulphadoxine-pyrimethamine (SP) for IPT. Thirty eight women (34.5%) had positive smear for malarial parasites, with 68.4% occurring among the primigravidae at 16-20 weeks of gestation in 60.5%. Thirty four (30.9%) women were treated for clinical malaria. Thirteen of them (38.2%) had recurrence with 9 (60.2%) occurring in primigravidae. **Conclusion:** The prevalence of malarial parasitaemia is high despite the use of 3 doses of SP for IPT. The prevalence and recurrence was higher in primigravidae. Other means to support drug preventive measures should be stressed.

KEYWORDS: Malarial parasitaemia, HIV positive, Pregnant women

INTRODUCTION

Malaria occurs mostly in poor, tropical and subtropical areas of the world including Nigeria and imposes substantial costs to both individuals and governments.[1] It is one of the most severe public health problems worldwide and a leading cause of death and disease in many developing countries, where young children and pregnant women are the groups most affected.[1] Because of the changes in women's immune systems during pregnancy and the presence of a new organ (the placenta) with new places for parasites to bind, pregnant women lose some of their immunity to malaria infection.[1,2] In addition to acute disease and deaths,[1] malaria also contributes significantly to maternal anaemia during pregnancy and adverse birth outcomes such as spontaneous abortion, stillbirth, premature delivery, and low birthweight.[2]

Each year, 25 to 30 million pregnancies in the sub-Saharan region are at high risk of these adverse consequences of malaria, with the highest risks among women in their first and second pregnancies and in women who are HIV-positive.[2,3] Although both malaria and HIV/AIDS have distinct risk factors for transmission, the two diseases are associated

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with poverty and share similar determinants of vulnerability to infection. Many of these determinants are present in sub-Saharan Africa. Malaria and HIV/AIDS therefore overlap geographically and target the same vulnerable populations in this region.[1,4,5] Because of the high prevalence of malaria and HIV infection in the region, co-infection and interaction between the two diseases are very common.[1-4] In pregnant women, HIV infection has also been shown to impair the ability of pregnant women to control infection with Plasmodium falciparum. HIV-positive pregnant women are more likely to have detectable parasitaemia, higher malaria parasite densities, and develop clinical or placental malaria and malarial anaemia than HIV-negative pregnant women[1,3,6] Reports also suggest that antimalarial treatment failure may be more common in HIV-infected adults with low CD4-cell counts compared to those not infected with HIV.[2,6,7]

To prevent malaria in pregnancy, the World Health Organization (WHO) recommends that all women living in sub-Saharan Africa should promptly treat malaria using effective antimalarial, receive intermittent preventive treatment during pregnancy (IPTp) and use long lasting insecticide-treated nets (LLINs) every night.[5] IPTp entails administration of a dose of an effective antimalarial drug (currently sulfadoxine-pyrimethamine) to all pregnant women whether or not they are infected with the malaria parasite.[1,5] The high and deadly interaction between malaria and HIV makes the prevention of malaria in HIV-positive pregnant women a public health priority in our environment with high transmission levels. Since HIV increases the severity of malaria in pregnant women, it is important to evaluate the impact of IPTp. The aim of this study therefore is to determine the prevalence of malaria parasitaemia and clinical malaria among HIV positive antenatal clinic attendees who had IPTp for malaria. This will give an insight to the impact of IPTp in HIV-positive pregnant women in the context of the currently available IPTp packages in our centre with a view to proffering suggestions as appropriate.

MATERIALS AND METHODS

This was a one year retrospective study conducted in the Obstetrics and Gynaecology Department of Aminu Kano Teaching Hospital, Kano, among HIV positive pregnant women who had antenatal care in our centre and had IPTp with sulphadoxine-pyrimethamine (SP) from 2nd January to 31st December, 2013. The institutional ethics and research committee approved the study. The lists of all HIV positive pregnant women during the study period were compiled from the ANC central register and their folders retrieved from the central record office. Necessary information for the study such as age, parity, gestational age at booking, number of SP given, previous treatment for malaria and result of malarial parasite tests were obtained and recorded in a proforma for the study. Similarly, the total number of women that had antenatal care during the same period was obtained from the statistics office of the hospital. Two doses of IPTp with SP combination are routinely given to pregnant women at booking usually after 16weeks or after quickening and repeated 4 weeks from the 1st dose but before 36 weeks of pregnancy. HIV positive mothers however were given 3 doses of the IPTp.

Determine® and Uni-Gold® rapid diagnostic tests kits were used to determine HIV status[3]. Routine microscopic examination for malaria parasite testing is done for all HIV positive pregnant women at booking and during their subsequent follow ups and the women who are HIV negative but are symptomatic. A blood specimen is usually collected from the patient and sent to the microbiology/parasitology laboratory of the hospital for processing. Both thick and thin smears are usually done and field staining techniques with a Romanovsky stain or Leishmans stain (but most often Giemsa)[1], is performed and then examined

visually with a 100X oil immersion objective for malaria parasites and to differentiate (when possible) the various species. HIV positive pregnant women who had malarial parasite smear test were included in this study and those without malarial parasite smear test were excluded. The data collected were analyzed by simple statistical methods and results were presented in tabular form as frequencies and percentages.

RESULTS

A total of one thousand, eight hundred (1800) pregnant women booked for antenatal care over the study period, and one hundred and ten (110) women were HIV positive, giving a sero-prevalence rate of 6.1%. Table I describes the socio-demographic and reproductive characteristics of the women. All of them were married. The women were within the age range of 18- 43 years with more than half (50.9%) of them between the ages of 21-30years. Majority (67.3%) were multiparous. Sixty one women (55.5%) were Christians and 49(44.5%) were Muslims. Up to 34.7% of the women had tertiary education, 32.7% secondary school education, 14.5% with primary school education and 7.2% with Qur'anic education. Twelve (10.9%) women had no any form of education. Ninety one (82.7%) of the women booked in the second trimester, fifteen (13.7%) booked in the third trimester and only four (3.6%) booked in the first trimester.

Thirty eight (34.5%) of the women were smear positive for malaria parasites, out of which twenty six were in primigravidae accounting for 68.4%, and the remaining twelve were in multigravidae accounting for 31.6%, as depicted in table II.

Table III shows the number of women treated for clinical malaria. Thirty four (30.9%) women were treated for clinical malaria using artemesinin based combination therapy. Fifteen were primigravidae accounting for 44.1%, those with second to fourth pregnancy (11) accounted for 32.4%, and 8 (23.5%) were grand multipara. Thirteen women (38.2%) were treated for clinical malaria more than once with 9 (69.2%) occurring in primigravidae while 4(30.8) in multiparae.

The number of women who had three doses of sulphadoxine-pyrimethamine is shown on table IV. Ninety (81.8%) of the women had 3 doses of sulphadoxine-pyrimethamine for intermittent preventive therapy. Primigravidae accounted for the highest (40%) number of women who had the 3 doses.

Table 1: Socio-demographic and Reproductive Characteristics of the Women

Variables		Number	Percentage (%)
Age (years)	≤20	12	11.0
	21-30	56	50.9
	31-40	22	20.0
	≥41	20	18.1
Total		**110**	**100**
Booking Trimester	1	4	3.6
	2	91	82.7
	3	15	13.7
Total		**110**	**100**
Education	Primary	16	14.5
	Secondary	36	32.7
	Tertiary	38	34.7
	Qur'anic	8	7.2
	None	12	10.9
Total		**110**	**100**
Parity	1	36	32.7
	2-4	50	45.5
	≥5	24	21.8
Total		**110**	**100**
Religion	Islam	49	45.5
	Christianity	61	55.5
Total		**110**	**100**

Table 2: Number of women with malaria positive smear

GRAVIDITY	No. OF POSITIVE SMEAR	PERCENTAGE (%)
1	26	68.4
2-4	7	18.4
5 and above	5	13.2
TOTAL	**38**	**100**

Table 3: Number of women treated for clinical malaria

GRAVIDITY	No. OF WOMEN TREATED FOR CLINICAL MALARIA	PERCENTAGE (%)
1	15	44.1
2-4	11	32.4
5 and above	8	23.5
TOTAL	**34**	**100**

Table 4: Number of women who had 3 doses of Intermittent Preventive Therapy

GRAVIDITY	3 DOSES OF SULPHADOXINE-PYRIMETHAMINE	PERCENTAGE
1	36	40
2-4	30	33.3
5 and above	24	26.7
TOTAL	**90**	**100**

DISCUSSION

The seroprevalence of HIV was found to be 6.1%, and the prevalence of malaria parasitaemia was found to be 34.6% among the HIV positive women in this study despite using three doses of SP for IPTp in 81.8% during their antenatal period. This prevalence is in agreement with 33% found in a study conducted in Ibadan, south western Nigeria[8]. Our finding was however higher than the 11.4%[9], 8%[10], and 15.3%[11] reported from previous studies. The differences may probably be due to the fact that late booking for antenatal care in this study was high. The high low parity group and lower educational status recorded in this study might have also contributed to these differences. Similarly since pregnant women are routinely given folic acid supplementation to prevent neural tube defects in their infants[1], high doses of folic acid counteract the effect of SP.[1] Therefore, it is preferred that women take only the recommended 0.4 mg daily dose of folic acid.[1] In our centre, 5 mg of folic acid are used, which may affect optimal efficacy of SP for IPTp. It is recommended to withhold folic acid supplementation for two weeks after taking IPTp with SP.[1]

This information may not have been passed to all the pregnant women by their physicians during consultations. The endemic nature of malaria in our region[12], might have also accounted for the differences. Our result was however lower than a prevalence of 53.5% found in a study from Ogun state Nigeria.[13] This difference may be accounted in part by the rain forest nature of the zone which favours mosquito breeding area.

HIV infection in pregnancy appears to impair a pregnant woman's ability to resist malaria infection. The protection expressed by gravid women to malaria disappears when HIV co-exist with malaria.[14] This result in HIV positive pregnant women being more likely to develop malaria than HIV negative pregnant women, and also have rapid progression of their HIV infection during pregnancy[15]. Interaction between malaria and HIV in pregnancy is a possibility in increasing the risk of vertical transmission of HIV.[15] Dual infection, therefore, has detrimental effect on maternal and child survival. Thirty four (30.9%) women came up with clinical malaria and were treated. Twenty (18.1%) had recurrence and were treated more than once. The prevalence of clinical malaria was higher among HIV infected primigravidae accounting for 44.1%. This may be due to the fact that primigravidae are first exposed to pregnancy and their immunity is not well developed compared to

the multigravidae. This is in keeping with reports from the literature that the highest risks of clinical malaria and adverse consequences are higher among women in their first and second pregnancies and in women who are HIV-positive.[2,3,16]

Our value is however 2-times higher than the value reported from a similar study in Kano[17], and a randomized control study in Malawi.[18] This could probably be due to the fact that many pregnant women accept the practice of HIV screening antenatally over the years and the HIV positive pregnant ones accept the use of anti-retroviral therapy and PMTCT. This calls for a review of their malarial preventive measures, in order to control the high prevalence of malarial parasitaemia and clinical malaria recorded in this study. This therefore further strengthened the need to intensify antenatal health preventive talk and community awareness campaigns on these diseases in order to ensure compliance and to reduce feto-maternal morbidity and mortality.

The prevalence of malarial parasitaemia is high despite the use of 3 doses of SP for IPT. The prevalence of clinical malaria was higher in primigravidae. Strategies to reduce the malaria morbidity during pregnancy should be reinforced in our locality with high HIV sero-prevalence. This could probably be achieved by Directly Observed Treatment (DOT) for the doses since some patients may not take it at home, which will improve IPTp delivery and impact. Other means to support and strengthen drug preventive measures should also be stressed.

Our study is limited by its retrospective nature where some data may not be available for analysis and also we did not determine the pregnancy outcomes since HIV infection and parasitemia are important independent risk factors for pregnancy adverse outcomes. Further research in these regards is recommended.

REFERENCES

1. Global Health- Division of Parasitic Diseases and Malaria. Centre for Disease Control and Prevention 2013; 1600 Clifton Rd MS A-06, Atlanta, GA 30333. http://www.cdc.gov/malaria/malaria_worldwide/reduction/iptp.html, accessed May 4th , 2014 @ 2200hours.

2. Chico RM, Pittrof R, Greenwood B, Chandramohan D. Azithromycin-chloroquine and the intermittent preventive treatment of malaria in pregnancy. Malaria Journal 2008; 7:255.

3. Perrault SD, Hajek J, Zhong K, Owino SO, Sichangi M, Smith G, et al. Human immunodeficiency virus co-infection increases placental parasite density and trans placental malaria transmission in Western Kenya. American Journal of Tropical Medicine and Hygiene 2009; 80(1):119-25.

4. United Nations Programme on HIV/AIDS. Epidemic update. UNAIDS Report on the global AIDS epidemic 2010. UNAIDS, 2010:16-61.

5. World Health Organization; Global Malaria Program. Updated WHO Policy Recommendation (October 2012): Intermittent Preventive Treatment of Malaria in Pregnancy Using Sulfadoxine-Pyrimethamine (IPTp-SP). Geneva, Switzerland: World Health Organization; 2012.

6. Chalwe V, Van geertruyden JP, Mukwamataba D, Menten J, Kamalamba J, Mulenga M, et al. Increased risk for severe malaria in HIV-1-infected adults, Zambia. Emerging Infectious Diseases 2009; 15(5):749.

7. Van Geertruyden JP, Mulenga M, Mwananyanda L, Chalwe V, Moerman

F, Chilengi R, et al. HIV-1 immune suppression and antimalarial treatment outcome in Zambian adults with uncomplicated malaria. J Infect Dis. 2006; 194(7):917-25.

8. Adeoti OM, Anumudu CI, Nwuba RI, Awobode HI, Olaniyan MF, Olayiwola O, et al. Prevalence of HIV and malaria co- infection in pregnant mothers and their babies post-delivery in saki, Ibadan. J biol Agr and health care 2012; 2(6):59-64.

9. Meshmek SR, Nwapasa V, Rogerson SJ. Prevalence of malaria in sub Saharan Africa. J Infect Dis.2006; 194(3): 273-275.

10. Ladner J, Lewy V, Simonon A, Karita E, Bogaerts J, De Clercq A. HIV infection, malaria, and pregnancy: a prospective cohort study in Kigali, Rwanda. Am J Trop Med Hyg 2002; 66 (1):56-60.

11. Nana OW, Fatou KC, Samuel AO, Andrew AA, Richard KG, Patricia R, et al. Intermittent Preventive Treatment with Sulfadoxine-Pyrimethamine against Malaria and Anemia in Pregnant Women. Am J Trop Med Hyg 2011; 85(1):12-21

12. Idowu O. Malaria infection during pregnancy in area of stable malaria.Nig Med Pract. 2006; 49 (5): 112-116

13. Sam-wobo, SO, Amusa AA, Mafiana CF. Assessment of HIV and malaria infection and perception among ANC women in Ogun state. J Nat Sci Eng Tech 2010; 9(1): 226-31.

14. Opare Addo HS, Odor AT. Malaria in pregnancy. In: Kwawukume EY, Emuvayan EE(Ed). Comprehensive obstetrics in the tropics. Dansoman: Asante and Hitscher printing press limited 2002; 1:250-258.

15. Christopher JM, Sally E, Theonest KM. Malaria in pregnancy. Br J Obstet Gynaecol. 2005; 112:1189-1195.

16. Brahmhatt H, Sullivan D, Kigozi G, Askin F, Wabwire-Mangenm F, Serwadda D. Association of HIV and malaria with maternal to child transmission, birth outcomes and child mortality. J Acquir Immune Defic Syndr.2008; 47:472-476.

17. Abubakar IS, Galadanci HS, Gajida AU. Prevalence of malaria in HIV positive women and practice of prevention in Aminu Kano Teaching Hospital, Kano. Trop J. Obstet Gynaecol. 2011; 28(1):32-5.

18. Filler SJ, Kazembe P, Thigpen M, Macheso A, Parise ME, Newman RD, et al. Randomized trial of 2-dose versus monthly sulfadoxine-pyrimethamine intermittent preventive treatment for malaria in HIV-positive and HIV-negative pregnant women in Malawi. J Infect Dis 2006; 194:286-93.

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