

Sero-Prevalence of Malaria, Hepatitis B and Syphilis Among Pregnant Women

¹Monsuru Adebayo Adeleke, ²Wasiu Olalekan Adebimpe,
³Sammy Olufemi Sam-Wobo, ¹Abideen Wahab,
¹Laide Sefunmi Akinyosoye and ¹Tobi Obafemi Adelowo

¹Department of Biological Sciences, College of Science,

Engineering and Technology, Osun State University, P.M.B 4494, Osogbo, Nigeria

²Department of Community Medicine, College of Health Sciences, Osun State University, Osogbo, Nigeria

³Department of Biological Sciences, College of Natural Science, Federal University of Agriculture, Abeokuta, Nigeria

Received 2012-12-22, Revised 2013-01-26; Accepted 2013-01-19

ABSTRACT

Malaria, syphilis and Hepatitis B during pregnancy are detrimental to the life of the pregnant women and the foetus. In this study, we documented the prevalence of the three diseases among pregnant women attending selected Comprehensive Health Care centers in Osogbo, Nigeria using serological kits of the 200 participants who consented to participate in the study, 26 (13%) were positive for malaria while 6 (3%) were positive for Hepatitis B. The co-infection of malaria and Hepatitis B was found only in two participants (1%) while none of the participants was positive for syphilis. There was no significant difference in the prevalence of malaria and Hepatitis B in relation to age ($p>0.05$). All the participants had good knowledge that mosquitoes transmit malaria but only 29 (14.5%) claimed to be sleeping under insecticide treated bed-net, About 169 (84.5%) relied solely on insecticide spray of the room and 2 (1%) did not practice any mosquito control measures. The results suggest the low prevalence of malaria, Hepatitis B and syphilis at the study area. However, early surveillance and adequate public health education will be immeasurable in safe-guiding the pregnant women from the detrimental effects of these infections.

Keywords: Malaria, Syphilis, Hepatitis B, Pregnant Women, Co-infection, Nigeria

1. INTRODUCTION

Malaria remains a major public health problem in Africa with pregnant women and children under five bearing the major burden of the infection. In Nigeria, malaria has been known to account for 11.5% of maternal death (Agomo *et al.*, 2009). *Plasmodium falciparum*, the predominant and most virulent malaria species in Nigeria has been identified as major cause of low birth weight, still births, spontaneous abortion or death of the susceptible pregnant women (Idowu *et al.*, 2006).

Syphilis is a Sexually Transmitted Infection (STI) caused by the *Treponema pallidum* spirochete. *T. pallidum* subspecies *pallidum* is a spiral-shaped, gram-negative, highly mobile bacterium (Eccleston *et al.*, 2008). Hepatitis B is an infectious inflammatory illness

of the liver caused by the Hepatitis B Virus (HBV) that affects hominoidea, including humans. The virus is transmitted by exposure to infectious blood or body fluids such as semen and vaginal fluids, while viral DNA has been detected in the saliva, tears and urine of chronic carriers (Stamm, 2010; Chang, 2007).

The complications of malaria, syphilis and hepatitis B are more pronounced among immune-compromised patients such as pregnant women and HIV infected individuals. These three infectious diseases cause similar adverse pregnancy outcomes which include spontaneous abortion, still birth or death of the pregnant women (Shafer and Moscick, 2006; Olokoba *et al.*, 2008). Therefore, early diagnosis of these deadly infections through screening among the pregnant women is crucial to the ongoing efforts and campaign on the reduction of

Corresponding Author: Monsuru Adebayo Adeleke, Department of Biological Sciences, College of Science, Engineering and Technology, Osun State University, P.M.B 4494, Osogbo, Nigeria

maternal and child mortality in Nigeria. This study, thus presents the results of sero-prevalence of malaria, Hepatitis B and syphilis conducted among pregnant women attending selected primary health facilities in Osogbo, Southwest, Nigeria.

2. MATERIALS AND METHODS

2.1. Study Area

The study was Osogbo in Southwestern Nigeria. Osogbo is the State capital of Osun, Nigeria. It lies on the latitude 7°46N and Longitude 4°36E and has a population of 156,694. There are three Comprehensive Health Care centers in the town to complement services provided in her eight Primary Health Centers, one general and one teaching hospital. Laboratory services for antenatal screening are available in all the health facilities except at the Primary Health Care centers.

2.2. Study Design

This is a descriptive cross sectional study done at antenatal screening for pregnant women attending selected Comprehensive Health Care centers in Osogbo in Southwestern Nigeria.

2.3. Study Population and Sampling Method

Include pregnant women registered in the selected health facilities and seen in the laboratory within a period of July 2011 and December 2012. Tertiary and secondary health facilities were excluded from the study. Only Comprehensive Health Care Centers (CHCs) were used because of availability of laboratory facilities. Two of the three CHCs were selected through simple random sampling employing simple balloting. All pregnant women who consented to the screening after counseling session carried out by the nurse counselor in these two facilities and within the stipulated period were used in this study.

2.4. Ethical Clearance

Ethical clearance was obtained from the research ethics committee of Osun State University College of Health Sciences. Permission was sought from the Management of the Clinic and informed consent was also sought and obtained from the participants.

2.5. Data Collection

Semi structured and pre tested questionnaires were interviewer administered to the participants by the researcher to obtain information on the age, occupation and knowledge on the diseases under study. After the

questionnaire administration, sterile disposable syringes were used to collect blood (about 5 mL) from the venopunctured vein under aseptic conditions.

All the specimens were tested for malaria, syphilis and Hepatitis B using rapid serological kits for syphilis, malaria and HBV (Global, Germany). The test strips were removed from the foil pouch and put vertically inside the tube. After 10 min of dropping blood samples, the strips were read as positive or negative in accordance with manufacturer's instructions. A sample was considered positive if it showed two red lines in the test strip and negative if it showed one red line, similar to the control. The study was conducted between November 2011 and February, 2012.

2.6. Data Analysis

The data was entered into the computer system and data validated through double entry and random checks. Data was analyzed using the SPSS software and frequency tables generated. The chi-square test was used to determine association between categorical variables and level of statistical significance determined at $p < 0.05$.

3. RESULTS

A total of 200 participants consented to be enrolled for the study within the study period. The demographic data of the study participants are presented in **Table 1**. Most of the study participants were within the age group of 25-30 years (40%) followed by 20-25 years (32.5%), while age group above 35 constituted the least (2.5%). Majority of participants were traders (39%) with no formal education (74.5%).

None of the 200 participants screened was positive for syphilis. However, 26 (13%) were positive for malaria while 6 (3%) were positive for Hepatitis B.

Table 1. Demographical data of the pregnant women

Demographic information	Frequency	(%)
Age		
15-20	10	5.0
21-25	65	32.5
26-30	80	40.0
31-35	40	20.0
Above 35	5	2.5
Occupation		
Trading	78	39.0
Civil servants	52	26.0
Health workers	33	16.5
Others	37	18.5
Educational status		
Formal education	51	25.5
Informal education	159	74.5

Table 2. Prevalence of Malaria, syphilis and Hepatitis B among the pregnant women

Parameters	Syphilis	Malaria	Hepatitis B	Malaria and Hepatitis B	Malaria and Syphilis	Syphilis and Hepatitis B
No positive (%)	0(0)	26 (13)	6 (3)	2(1)	0(0)	0(0)
No negative (%)	200 (100)	174(87)	194(97)	198(99)	200 (100)	200 (100)

Table 3. Prevalence of Malaria and Hepatitis B in relation to age among pregnant women

Age group	No screened	No positive for malaria (%)	No positive for Hepatitis B (%)
15-20	10	1 (10)	1 (10)
21-25	65	5 (7.7)	3 (4.6)
26-30	80	16 (20)	2 (2.5)
31-35	40	4 (10)	0(0)
36 and above	5	0 (0)	0(0)

Table 4. Knowledge on STD, sexual activity and malaria prevention among the pregnant women

Parameters	Frequency	(%)
Knowledge on STI		
Yes	10	5.0
No	190	95.0
Sexual activity		
One sexual partner	200	100.0
More than one	0	0.0
Knowledge on malaria transmission		
Yes	200	100.0
No	0	0.0
Malaria prevention		
Insecticide spray	169	84.5
ITN usage	29	14.5
None	2	1.0

The co-infection of malaria and Hepatitis was found only in two participants (1%) as seen in **Table 2**. There was no significant difference in the prevalence of malaria and hepatitis B in relation to age ($p > 0.05$) as seen in **Table 3**.

The questionnaire survey showed that only little proportion of the study participants (5%) previously had Sexually Transmitted Infections (STIs). Most of the participants have never had blood transfusion (99%). All the participants had good knowledge that mosquito transmit malaria but only 29 (14.5%) usually claimed to be sleeping under insecticide treated bednet while 169 (84.5%) relied only on insecticide spray of the room and 2 (1%) did not practice any mosquito control measures as in **Table 4**.

4. DISCUSSION

The results of the present study showed that the prevalence of malaria in pregnancy is higher than Hepatitis B while co-infection is extremely low. A

prevalence of 13% of malaria was recorded which, albeit, extremely low when compare with high prevalence (72%) earlier reported by Adefioye *et al.* (2007), for malaria in pregnancy in Osogbo, Nigeria. The difference in the prevalent rate could be associated with many factors among which are diagnostic tool used, changes in environmental conditions, improved malaria control activities and over-diagnosis.

Though, only few participants claimed to be sleeping under ITN as revealed by questionnaire survey, Osogbo metropolis has witnessed tremendous improvement in environmental sanitation in the past one year due to the weekly environmental sanitation exercise declared by Osun State Government. This activity could have led to the elimination of potential breeding sites of malaria vectors. Moreover, unlike previous study which used microscopic technique, the present work utilized rapid diagnostic kit which is specific for detection of *P. falciparum* only. Recent studies in Nigeria and other African countries have shown that the high prevalence of malaria reported in some endemic communities using microscopy may be in part, due to over-diagnosis (Agomo *et al.*, 2009; Zurovac *et al.*, 2006). Thus, there is need for re-validation of the existing data on malaria in Nigeria, most importantly in areas where high prevalence has been reported.

Though, the prevalence of hepatitis B and its co-infection with malaria was low in this study, the co-infection of both infectious diseases is detrimental to the life of pregnant women and the un-born baby. Almost 90% of babies delivered with mothers having HVB will become chronically infected with hepatitis B at birth if there is no prevention (Stamm, 2010; Chang, 2007). The usual clinical signs are jaundice, icterus, hepatic tenderness and weight loss (Chang, 2007).

The zero prevalence of Syphilis recorded in the present study may indicate that the infection is rare at the study area. Previous studies in different parts of Nigeria have also reported low prevalence (Ozumba *et al.*, 1999; Aboyeji and Nwabuisi, 2003), but higher prevalence has been reported in some African Countries such as Zambia (12.5%) (Ratnam *et al.*, 1982), Mozambique (18.3%) (Lindstrand *et al.*, 1993) and Malawi (5%) (Kwiek *et al.*, 2008) and outside Africa such as in Brazil (Miranda *et al.*, 2012). The

National prevalence for syphilis in pregnant Nigerian women has been estimated as 0.3% (FMOH, 2004). Recent report of 0% prevalence among 4,452 pregnant Afghan women receiving antenatal care at three government maternity hospitals in Kabul also compared with the results of this study. It is however not illogical, to express that congenital syphilis may have no major role as a cause of perinatal mortality in the study area.

5. CONCLUSION

The results of the study demonstrated the low prevalence of malaria, hepatitis B and syphilis at the study area. Though routine screening for 'co-infections' are rare practices, authors advocates regular surveillance and adequate public health education targeted at these diseases, as it is valuable in safe-guarding these immune-compromised women from the detrimental effects of these infections.

6. ACKNOWLEDGEMENTS

Researcher showed appreciation to ethical review committee of UNIOSUN, the heads of selected health facilities and the pregnant women who consented to taking part in study. Funding for this study was from personal contributions from the authors, no external funding.

7. REFERENCES

- Aboyeji, A.P and C. Nwabuisi, 2003. Prevalence of sexually transmitted diseases among pregnant women in Ilorin, Nigeria. *J. Obstet. Gynaecol.*, 23: 637-639. PMID: 14617466
- Adefioye, O.A., O.A. Adeyeba, W.O. Hassan and O.A. Oyeniran, 2007. Prevalence of Malaria Parasite Infection among Pregnant women in Osogbo, Southwest, Nigeria. *Am. Eurasian J. Scientific Res*, 2: 43-45.
- Agomo, C.O., W.A. Oyibo, R.I. Anorlu and P.U. Agomo, 2009. Prevalence of malaria in pregnant women in Lagos, South-West Nigeria. *Korean J. Parasitol*, 47: 179-183. PMID: 19488427
- Chang, M.H., 2007. Hepatitis B virus infection. *Seminars Fetal Neonatal Med.*, 12: 160-167. DOI: 10.1016/j.siny.2007.01.013
- Eccleston, K., L. Collins and S.P. Higgins, 2008. Primary syphilis. *Int. J. STD AIDS*, 19: 145-151. DOI: 10.1258/ijsa.2007.007258
- FMOH, 2004. National HIV/Syphilis sentinel survey among pregnant women attending antenatal clinics in Nigeria, Abuja. Federal Ministry of Health, Nigeria, pp: 125.
- Idowu, O.A., C.F. Mafiana and S. Sotiloye, 2006. Malaria among pregnant women in Abeokuta, Nigeria. *Tanzanian Health Res. Bull.*, 8: 28-31.
- Kwiek, J.J., V. Mwapasa, A.P. Alker, A.S. Muula and H.E. Misiri *et al.*, 2008. Socio-demographic characteristics associated with HIV and Syphilis seroreactivity among pregnant women in Blantyre, Malawi, 2000-2004. *Malawi Med. J.*, 20: 80-85. PMID: 19537404
- Lindstrand, A., S. Bergstrom, A. Bugalho, G. Zanconato and A.M. Helgesson *et al.*, 1993. Prevalence of Syphilis infection in Mozambican women with second trimester miscarriage and women attending antenatal care in second trimester. *Genitourin Med.*, 69: 421-433.
- Miranda, A.E., N.C. Figueiredo, V.M. Pinto, K. Page and S.Talhari, 2012. Risk factors for syphilis in young women attending a family health program in Vitoria, Brazil. *An. Bras. Dermatol.*, 87: 76-83. PMID: 22481654
- Olokoba, A.B., L.B. Olokoba, F.K. Salawu, A. Danburam and O.O Desalu, 2008. Syphilis and HIV co-infection in North-eastern Nigeria. *Int. J. Trop. Med.*, 3: 70-72.
- Ozumba, U.C., D.C. Oshi, C.M. Nwokeji and S.E. Anya, 1999. Trends in seroreactivity for syphilis among pregnant Nigerian women. *Sex. Transm Infect.*, 75: 120-123. PMID: 10448366
- Ratnam, A.V., S.N. Din, S.K. Hira, G.J. and D.S. Wacha, 1982. Syphilis in pregnant women in Zambia. *Br. J. Vener. Dis.*, 58: 355-358. PMID: 6756542
- Shafer, M. and A. Moscicki, 2006. Sexually transmitted infections.
- Stamm, L.V., 2010. Global challenge of antibiotic-resistant *Treponema pallidum*. *Antimicrob. Agents Chemother*, 54: 583-589. PMID: 19805553
- Zurovac, D., B. Midia, S.A. Ochola, M. Englishm and R.W. Snow, 2006. Microscopy and outpatient malaria case management among older children and adults in Kenya. *Trop. Med. Int. Health*, 11: 432-440. PMID: 16553926