

## Prevalence of Malaria Parasite and Hepatitis B Virus among Pregnant Women Attending Ashaka Medical Center, Gombe State

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### Abstract

*The study was conducted to determine the prevalence of Malaria parasite and Hepatitis B virus among pregnant women at Ashaka medical centre, Gombe State. The tests were carried out using diagnostic test device for malaria parasite S.D Standard diagnostic device INC. Lot No\_082230K, and for Hepatitis B virus kit Disport test strip lot No-BSA305006. Questionnaires were administered to help in determining the risk factors. The study was conducted from April to July 2014. 140 pregnant women were screened for Malaria parasite and Hepatitis B surface antigen. Out of the 140 pregnant women tested only 26 (18.6%) were positive to malaria and 12 (8.6%) were positive for HBV. Therefore, government is commended for the slight decrease of this infection and encouraged to act drastically for total eradication.*

**Keywords:** Malaria; Hepatitis B; Prevalence; and Women

### Introduction

Malaria infection in pregnancy is major health problem in Africa especially in tropical and sub-tropical region where poor environmental hygiene, poverty and ignorance are the main epidemiological factors, causing significant mortality among pregnant women and their fetus. The burden of malaria infection during pregnancy is caused mainly by plasmodium falciparum pregnant women are at higher risk of malaria infection as pregnancy reduces a women's immunity to infection (Schulman *et al*, 2003, and WHO, 2008). The recent world

malaria report, which indicated that Nigeria accounts for a quarter of all malaria cases in the 45 malaria-endemic countries in Africa, clearly showed the challenges of malaria in Nigeria (WHO, 2008). This may be due to the large population approximately 160 million people living in areas of high malaria transmission. In Nigeria 11% of malaria deaths are attributed to malaria and pregnant women are known to be one of the groups at high risk of the effects of malaria infection, need special protection measures to ensure their survival and improve birth outcome.

Hepatitis B virus HBV is a DNA virus of the family of hepadnaviridae and causative agent of hepatitis B infection (Unekeet *al.*, 2005) Hepatitis B is one of the major common infection diseases of the liver worldwide caused by a small evolved DNA virus, the hepatitis B virus (HBV). The virus was first discovered as "Australian antigen" later named Hepatitis B surface antigen HBsAg in patient blood. Hepatitis B antigen HBsAg was identified several year later as a marker for patients at high risk transmission of the disease (Unekeet *al*, 2005) Hepatitis B virus is 50-100 times more infections than HIV and 10 times more infections than Hepatitis C virus (HCV) many carriers do not realize they are infected with the virus, thus it is referred to as a "silent killer" (Unekeet *al.*, 2005) it is estimated that more than two billion people have been infected by HBV worldwide and 350million people have chronic infection (Unekeet *al.*, 2005). Testing for HBV infection in pregnancy is important in

view of the morbidity and mortality of the host pregnant women, its effect on the process of parturition, and the risk of vertical transmission from mother-to-child. Nigeria is classified among groups of countries endemic for HBV infection. Currently about 18 million Nigerian are infected (Mbaawuga, 2008) many of these people may not be aware of the infection and hence fall to seek appropriate medical attention therefore progressing to chronic liver disease, cirrhosis and hepatocellular carcinoma. Similarly when pregnant women are involved they constitute a serious health risk not only to their unborn child but also the society at large.

There is increased in malaria parasites infection and Hepatitis B virus among pregnant women, especially in tropical and sub-tropical region where poor environmental hygiene, poverty and ignorance are the main epidemiological factor causing significant mortality amongst pregnant women and the fetus sharing of shape objects also contributing to the transmissions of hepatitis B-virus and sexual intercourse. The investigation will be of good help to ascertain the prevalence of malaria parasite and Hepatitis B virus among pregnant women attending Ashaka medical center, Gombe State.

## **Materials and Method**

### **Study Area**

The study was carried out among pregnant women attending anti-natal care (ANC) at Ashaka medical center, Gombe State. It is located at the North Eastern part of Nigeria. Funakaye Local Government of present Gombe State and is it bounded by notable villages which include Bajoga, GongillaMaza and AshakaGari

### **Study population**

The study was conducted at Ashaka medical center, Gombe State between May-July 2014. It consists of 140 pregnant women attending Ashaka medical center for anti-natal care (ANC)

after advising them on the need for them to know their status they all cooperated. Ethical clearance was obtained from the research ethical committee of training and learning manager of Ashaka cement plc (Lafarge) and the medical director of the medical center of Ashaka.

### **Questionnaire**

Questionnaire was used in this study to collect data from each pregnant woman. All of them fulfilled the inclusion criteria were interviewed in detail and the data was recorded on a prescribed questionnaire. The following information was requested from the subject in a structured questionnaire: Age, gravidity (Primigravida or Multigravida) Educational Status and trimester (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> trimester) on the disease under study.

### **Sample collection**

5ml of blood was obtained by venopuncture. The point of collection as first sterilized with 70% alcohol and cotton wool. Sterile needle was then inserted into the vein and the blood was withdrawn into the syringe 1ml of freshly collected blood was removed for malaria parasite test. The remaining (4ml) was introduced into a clean test tube and centrifuged at 2500rpm for 5 minutes. Part of the sera collected for was tested for Hepatitis B (HbsAgs).

### **Malaria parasite rapid diagnostic test device**

The 1ml of freshly collected blood was used, the blood was transferred into the test kits hole and 3 drops butter water was added and waited for 5-10 minutes the test device S.D Standard Diagnostic, INC. Lot No\_082230k was placed on a clean and level surface. The colored lines were waited to appear the results were read in 15 minutes. Two lines appearing on test kits meaning positive, only one line appear indicating Negative results.

## Hepatitis b surface antigen (HBsAg)

The test kit Disport test strip lot No\_ BSA 3050063, then the test device was removed to its protecting paunch. And the test strip was dipped with arrow pointing down into the vessel of the seam for about 10 second and the result was after 10minutes. One colour band appears on the control C region no apparent band on the test T region (Negative result). In addition to pink colour control C band a distinct pink colour band will appear in the test T region (Positive result). No line appearing in both C and T region that is control and test region (Invalid result). The test kit can be stored at temperature between 22 and 30<sup>0</sup>c in the sealed pouch to the date of expiration and test kit should be kept away from direct sun light moisture and heat.

### Statistical analysis

The statistical analysis was conducted using SPSS 20 package by using  $\chi^2$  square to determine the relationship between age, gravidity, educational status and pregnancy trimesters.

### Results and Discussion

In this study to determine the prevalence of malaria parasite and hepatitis B virus on pregnant women 140 women were screen and administered with questionnaire, the result shows 26 (18.6%) were positive to malaria and 12 (8.6%) were positive to hepatitis B virus as shown in Table 1,2,3, and 4. This figure is lower than the prevalence reported by Japhet *et al.* (2011) among pregnant women in Nigeria. The results of this study show the overall malaria prevalence of 18.6% among women attending Ashaka medical center Gombe state. The result recorded is lower than 76.9% prevalence recorded by Adefioye *et al.*, (2007) in Oshogbo southeast Nigeria. Likewise Hepatitis B surface antigen with 8.6% lower to that reported by Uneke *et al.*, (2005) in Jos North central Nigeria. It should be noted, however, that there

are no available literatures or researches that have been conducted on hepatitis B infection in the identified area upon which the authors can lay their hands.

Malaria parasite infection was found to be more prevalent among women of age 21-25 years followed by 26-30 while the least was 30 years above. Similarly Hepatitis B surface antigen was found to be more prevalent among women of age 21-25 years followed by 26-30 and the least prevalent was 30 years above (Table 1). This is not surprising since 90% of chronic of hepatitis B infection occurs among younger ages, although, no statistical significance observed between higher and lower infectivity as attached to age (Isaet *al.* 2013)

With respect to gravidae, Malaria parasite was shown to be prevalent with primigravidae with (23.7%) to that of multigravidae with (14.8%) this is not surprising taking to consideration that primigravidae women are not exposed to necessary anti natal care and counseling. Likewise hepatitis B surface antigen was also found to more prevalent with primigravidae with (11.9%) to that of multigravidae with (6.2%) (Table 2).

Trimester consider as a risk factor shows the record of prevalence of malaria parasite and Hepatitis B among the pregnant women based on Trimester, first, second and third trimester. First trimester was recorded with highest number for malaria parasite and Hepatitis B among the pregnant women (Table 3). The prevalence of malaria and Hepatitis B among pregnant women based on educational status (formal education and non formal education) shows that non-formal was having the highest number of positive for malaria and the hepatitis B surface antigen while the formal education was recorded the lowest (Table 4) This might be due to the high level of awareness for the preventive measures among those groups that have formal education.

**Table 1:** Prevalence of malaria parasite and Hepatitis B infection among pregnant women distribution on age

A g e	Total (%)	†Malaria Parasite +ve			††HbsAg +ve											
14 – 20	34(24.3)	6	.	0	1	7	.	6	2	.	0	5	.	9		
21 – 25	57(40.7)	1	0	.	0	1	7	.	5	8	.	0	1	4	.	0
26 – 30	30(21.4)	8	.	0	2	6	.	7	2	.	0	6	.	7		
> 30	19(13.6)	2	.	0	1	0	.	5	0	.	0	0	.	0		
<b>T o t a l</b>	<b>140(100)</b>	<b>2</b>	<b>6</b>	<b>.</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>.</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>.</b>	<b>0</b>	<b>8</b>	<b>.</b>	<b>6</b>

† ( $\chi^2 = 2.1723$ , df = 3, p = 0.5374)      †† ( $\chi^2 = 4.4051$ , df = 3, p = 0.2209)

**Table 2:**Prevalence of malaria parasite and Hepatitis B infection among pregnant women distribution on gravidae

G r a v i d a e	Total (%)	†Malaria Parasite +ve			††HbsAg +ve											
<b>Multigravidae</b>	<b>81(57.9)</b>	<b>12.0</b>			<b>14.8</b>			<b>5.0</b>	<b>6.2</b>							
<b>Primigravidae</b>	<b>59(42.1)</b>	<b>1</b>	<b>4</b>	<b>.</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>.</b>	<b>7</b>	<b>7</b>	<b>.</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>.</b>	<b>9</b>
<b>T o t a l</b>	<b>140(100)</b>	<b>2</b>	<b>6</b>	<b>.</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>.</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>.</b>	<b>0</b>	<b>8</b>	<b>.</b>	<b>6</b>

† ( $\chi^2 = 1.2526$ , df = 1, p = 0.2631)      †† ( $\chi^2 = 0.7782$ , df = 1, p = 0.3777)

**Table 3** Prevalence of malaria parasite and Hepatitis B infection among pregnant women distribution on trimester

Trimester	Total (%)	†Malaria Parasite +ve	†Malaria Parasite +ve (%)	††HbsAg +ve	††HbsAg +ve (%)
First	80(57.2)	12.0	15.0	7.0	8.8
Second	44(31.4)	10.0	22.7	3.0	6.8
Third	16(11.4)	4.0	25.0	2.0	12.5
<b>T o t a l</b>	<b>140(100)</b>	<b>26</b>	<b>018</b>	<b>612</b>	<b>086</b>

†( $\chi^2 = 18.1468$ , df = 2, p = 0.0001147)

††( $\chi^2 = 0.4909$ , df = 2, p = 0.7823)

**Table 4:** Prevalence of malaria parasite and Hepatitis B infection among pregnant womendistribution on educational status

Education	Total (%)	†Malaria Parasite +ve	†Malaria Parasite +ve (%)	††HbsAg +ve	††HbsAg +ve (%)
Formal	53(37.9)	8.0	15.1	4.0	7.5
Non-Formal	87(62.1)	18	020	78	092
<b>T o t a l</b>	<b>140(100)</b>	<b>26</b>	<b>018</b>	<b>612</b>	<b>086</b>

†( $\chi^2 = 0.3621$ , df = 1, p = 0.5474)

††( $\chi^2 = 7e-04$ , df = 1, p = 0.9787)

**Conclusions**

This study has provided information on the prevalence of Malaria parasite and HBV infection in Ashaka Medical centre Gombe

State Nigeria, although Malaria and HBV they are not co-infection but when they occur concurrently might lead to loosing unborn child by pregnant women, pregnant women

should be seriously monitored to avoid anemia. Free screening and immunizing of all pregnant women and their infants should be incorporated in the antenatal and postnatal programmes in hospital to prevent post natal infection of the infant by their infected mothers.

## REFERENCES

- [1.]Adetioye, O.A.,Adeyeba, O.A., Hassan, W.O. and Oyeniran, O.A (2007) Prevalence of malaria parasite among pregnant women in Osogbo South West, Nigeria. *American-Eurasian Journal of scientific research* 2(1): 43-45.
- [2.]Mbaawuga, E.M. (2008) Hepatitis B Virus( HBV) Among pregnant women in Makurdi, Nigeria, *Africa journal of Biochemical Research* (11) pp 155-159
- [3.]Isa, M.A., Bello, H.S., Shettima, A. and Allamin I.A (2013) Prevalence of serological marker for chronic hepatitis b virus among patientsattending Sokoto specialist hospital, Sokoto, Nigeria. *Journal of Microbiology and Biotechnology Research*3 (3): 122-125
- [4.]Obi, R.K.,Umeh, S.C., Okurede, O.H. and Iroagba I.I (2008) Prevalence of hepatitis B virus infection in an antenatal clinic in Portharcourt, Nigeria. *Science world journal* 2:5-8.
- [5.]Okwaa, O.O. (2003) The status of malaria among pregnant women; a study in Lagos,Nigeria *African journals of reproductive health* 7 (3)77-83.
- [6.]Schulman, C.E., Marshal,T. and Dorman, E.K. (2003).Malaria in pregnancy; adverse effect on hemoglobin in levels and birth weight in primigravidae and multigravidae.*Tropical medicine of international health* 6(16)770-778.
- [7.]Uneke, C.J., Ogbu, O., Inyama, P.U., Anyanwu, G.I., Njoku, M.O.and Idoko, J.H. (2005) Prevalence of hepatitis B surface antigen among blood donors and human immunodeficiency virus-infected patients in Jos,Nigeria :100:13-6.
- [8.]World Health Organization (WHO) (2008) Expert committee on malaria Eighteenth report, world Health organization Technical report 735.