



Seroprevalence of HIV, Hepatitis B and C viruses among antenatal clinic attendees of Secondary Healthcare facilities in Akoko area of Ondo State, Nigeria

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ABSTRACT

Vertical transmission of HIV, HBV and HCV is associated with high risk of maternal complications, foetal death or impaired mental and physical health. A standing regulation for screening of all pregnant women is often avoided by the patients and hospitals. This study was designed to assess the incidence of these infections among antenatal patients in the studied community. The study was carried out among four hundred and thirty-two (432) pregnant women attending ante-natal clinics of State General Hospital and Inland Maternity Center, Ikare-Akoko, Ondo State, Nigeria. Two milliliters (2ml) of blood samples were collected from antenatal patients between April and September, 2015 and screened for, HIV, HBV and HCV using rapid chromatographic immunoassay methods in accordance with the national algorithm. The age of the patients ranged between 15 and 40 years. A total of 11(2.6%); 8(1.9%) and 3(0.7%) patients were seropositive for HIV, HBV and HCV infections respectively. Co-infections of HIV and HBV were diagnosed among 3(0.7%) of the volunteers. There was no case of co-infection of HIV with HCV or HBV with HCV. The prevalence rates recorded for these three infectious diseases call for an aggressive advocacy for compulsory screening of all antenatal patients by all health facilities.

INTRODUCTION

Vertical transmission of pathogens remains the major source of neonatal infections in most developing nations of the world. Among the commonly transmitted pathogen from mother to child are Human Immunodeficiency Virus (HIV), Hepatitis B and Hepatitis C viruses (HBV and HCV). Ante-natal routine screening exercise includes screening for Syphilis, HIV and HBV infections which are often complied with in the Tertiary health care facilities but not usually in the Secondary facilities which are more in number and are regularly visited by low and middle income patients. The common challenges for effective antenatal screening reported by EU/EEA countries were the deficiencies in data reporting and collection at the national level, insufficient capacity to reach groups at risk and a general lack of resources for these activities (ECDC, 2016). The trio of HIV, HBV and HCV are blood borne viruses that are transmitted by sexual intercourse, intravenous drug use, moist and dirty environmental surfaces, blood transfusion, contaminated body fluids and from mother to child - vertical transmission (Collenberg et al., 2006; Shephard et al., 2006). About 350 million people are infected globally with two million deaths recorded annually from HBV infections in the Sub-Saharan Africa (Uneke et al., 2005). Nigeria is endemic for HBV with about 18 million people infected (Jombo et al., 2005). Many of these are healthy carriers while in others, the virus may progress to cause chronic liver disease and hepatocellular carcinoma (Mbaawuaga et al., 2008). A prevalence rate of between 2.2% and 15.1% of HBV infections have been documented among pregnant women in Nigeria (Awoleke, 2012; Olokooba et al., 2011; Ndams et al., 2008). HBV infections does not appear to increase mortality during pregnancy but have much effect on the infants who are often born prematurely with impaired mental and physical health in addition to low birth weight (Tse et al., 2005). HBV infection among pregnant women have been associated with gestational diabetes and antepartum haemorrhage (Tse et al., 2005). HCV is less virulence and in most cases asymptomatic and can be transmitted through the same rout as HBV. Globally, about 130–150 million people are infected with HCV and 3.5 millions of these are from the United States. It has been diagnosed among pregnant women in Nigeria with varying prevalence rates of between 0.5% and 3.6% (Ugbebor et al., 2011; Agarry and Lekwot, 2010). HIV, which has become one of the better-quantified disease burden in global health, was in 1990s to be screened for, among pregnant women attending antenatal clinic as part of the established sentinel surveillance of HIV (WHO, 1989). The prevalence among pregnant women in Sub-Saharan Africa was 5.3% but 4.3% in Western Africa (Eaton et al., 2014). The prevalence in Nigeria varies from 1.2% to 4.6%. The benefits of early detection of infected mothers span beyond record keeping but will help to identify and appropriately place the affected infants on prophylaxis, treat mother and allow for contact tracing of sexual partners and domestic contacts, for counseling, testing and treatment or vaccination if need be (Travers et al., 2015). Healthcare providers are equally better informed and prepared to minimize spread during delivery. Most studies predominantly reported HBV among pregnant women and few studies have reported HIV co-infection with HBV but information are still very scanty about HCV co-

infection with either HIV or HBV especially in the studied population among pregnant women. This study therefore examined the incidence of seropositive (to the three viruses) antenatal patients visiting the very busy and centrally located State General Hospital and Inland Maternity Center in Ikare-Akoko area of Ondo State, Nigeria. These facilities are visited by about 80% of all antenatal patients in Akoko Land.

MATERIALS AND METHODS

Research Design

This is a six-month (April – September, 2015) hospital based cross sectional study

Study Population

All pregnant women of different ages that attended routine antenatal clinic and in their first visit to State General Hospital and Inland Maternity Center Ikare-Akoko, Ondo State were recruited into the study.

Ethical Issues

The ethical committees of the two Hospitals approved the study. Informed consent form was signed by each volunteer participant. Volunteers' names and their corresponding identification numbers used in the data collection process were kept confidential. All positive participants were referred to the appropriate clinics for follow up management.

Sample Collection

Two milliliter (2ml) of blood samples were collected from the pregnant women by venepuncture into clean bottles on clinic days for first time attendees. The samples were properly labeled and transferred to the laboratory for analysis. Questionnaire was also administered on each participant to obtain their age, occupation, educational status and involvement in related risk factor activities.

Sample Analysis

Standard diagnostic rapid one step test dipsticks (Two Dot, manufactured by Beijing Kinghawk Pharmaceutical Co., Ltd., Batch numbers: 13485 & 13667, Expiry date: 09/2017) were used to screen for antibodies to Hepatitis B and C viruses in the blood samples collected. The test is based on the principle of sandwich immunoassay for determination of HBV and HCV antibodies in serum.

Test procedure

The clotted blood sample was spun for 5min at 1,500rpm and the serum obtained was used for the analysis. The test strip was removed from the pouch and immersed into the sample container from the arrow end within the maximum line. The strip was taken out after 8 – 10 seconds and laid the strip flat on a clean, dry and non- absorbent surface. The result was read after 5- 10 minutes. The results are read as positive, negative or invalid, according to manufacturer's direction.

Data Collection

The data used for analysis was derived from serological testing and

questionnaire. Socio-demographic and risk factor data was collected using a well-structured questionnaire. HIV screening results were obtained from individual volunteer's case note as carried out by the Hospital using the National algorithm of serial testing.

Statistical Analysis

Simple mean and percentage were used in the data analysis.

RESULTS

A total of four hundred and thirty-two pregnant women volunteered to take part in the study. Age range of 21-30 has the highest (69.9%) participants. There were four unmarried pregnant ladies representing 0.9% of the participants. Forty-eight point six percent (48.6%)

of the volunteers were self employed while 8.1% were complete house wives. Two hundred and forty- one 241(55.8%) had Secondary School education as their highest educational qualification while 9(2.0) had no formal education. These data are presented in Table 1. Figure 1 showed the prevalence rates obtained from this study for HIV(2.6%), HBV(1.9%) and HCV (0.7%). The age group of 21-30 years had 6 HIV, 3 HBV and 2 HCV positive cases, closely followed by age group 31-40 where the highest positive cases (4) were recorded for HBV infections as shown in Table 2. Figure 2 showed that 3(6.7%) participants had co-infections of HIV and HBV. Multiple sexual partners was the most important risk factor responsible for 5(11.1%) and 3(3.7%) HIV and HBV infections respectively among the participants as shown in Table 3. Scarification appeared not a serious risk factor with all 84 involved were negative to all the three viral infections tested.

Table 1: Socio-Demographic Characteristics of the volunteers in the study.

Variables	Number of Volunteers (%)
Ages	
15 – 20	29 (6.7)
21 – 30	298(69.0)
31 – 40	86(19.9)
41 – 50	19(4.4)
Marital Status	
Unmarried pregnant ladies	4(0.9)
Married	428(99.1)
Occupational Status	
Self employed	210(48.6)
Civil Servants	187(43.3)
Unemployed	35(8.1)
Educational Status	
Informal	9(2.0)
Primary education	97(22.5)
Secondary education	241 (55.8)
Tertiary education	85(19.7)

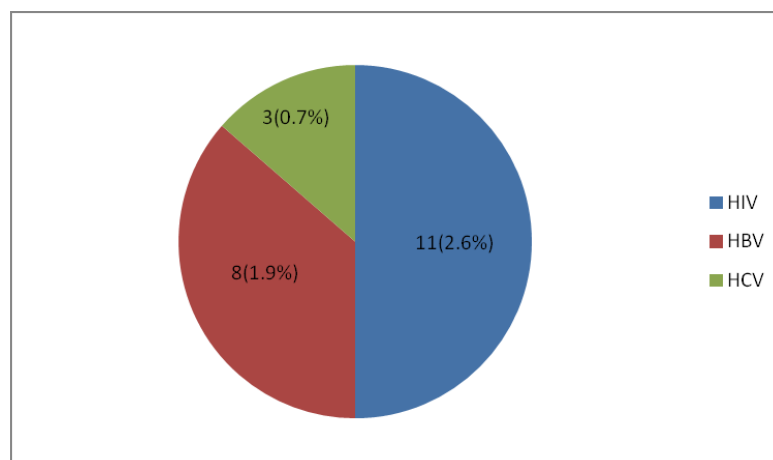


Figure 1: Seroprevalence among volunteers to the three viral infections

Table 2: Seroprevalence among volunteers by age distribution

Age(yr)	N	HIV		HBV		HCV	
		Pos	(% Pos)	Pos	(% Pos)	Pos	(% Pos)
15-20	29	1	3.4	0	0	1	3.4
21-30	298	6	2.0	3	1.0	2	0.7
31-40	86	3	3.5	4	4.7	0	0
41-50	19	1	5.3	1	5.3	0	0

N= number examined

Table 3: Prevalence in relation to associated risk factors.

Behaviors	N	HIV		HBV		HCV	
		Pos	(% Pos)	Pos	(% Pos)	Pos	(% Pos)
Multiple ear piercing	91	2	2.2	2	2.2	1	1.1
Tattooing	47	2	4.3	3	6.4	2	4.3
Scarification	84	0	0	0	0	0	0
Multiple sexual partners	45	5	11.1	3	6.7	0	0
Unclassified	165	2	1.2	0	0	0	0

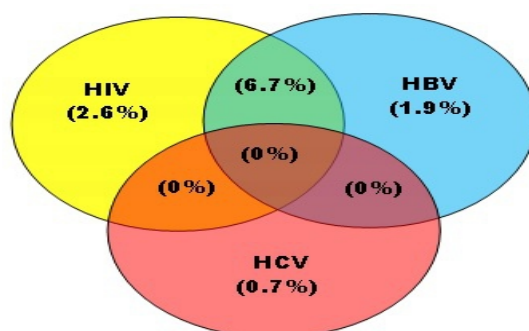


Figure 2: Prevalence of co-infections among volunteers.

DISCUSSION

The prevalence of HIV infection among the studied population was 2.6% and this is lower than the national prevalence rate of 4.5% and those of many other studies conducted in different parts of the country. In a study by Wasa et al., (2014) a prevalence rate of 9.4% in Gombe State was reported, Okerentugba et al., (2015) reported 3.0% prevalence in Port Harcourt, 3.3% prevalence was also reported by Omisakin et al., (2014) in Ido-Ekiti. In Sub-Saharan Africa, HIV prevalence among pregnant women was 5.3%, while in other West African countries, it ranged between 3.3% in Senegal and 5.1% in Cameroon (Eaton et al., 2014). Although, these other studies reported higher prevalence than observed in this current study, the seropositive pregnant women could be assisted with their babies to further reduce the prevalence rate. Pregnant women aged between 21-30 were the most infected representing more than half of the seropositive

population, this agrees with the work of Eaton et al., (2014), Wasa et al (2014) and Okerentugba et al. (2015). This age bracket is the actively reproducing age with high sexual activities and the largest among the studied population (69.0%). Multiple sexual partners was the risk factor that gave the highest HIV seropositive pregnant women. In a study by Aboh et al., (2015), 82.4% of participant agreed that multiple sexual partners constitute a risk factor, yet there is no attitudinal change about this behavior. The global economic recession may be a contributing factor, where the woman needs additional income to meet her commitment. A prevalence of 1.9% seropositive cases to viral Hepatitis B infection recorded in this study was far lower than that reported for Abuja, which ranged between 9.5-10% (Kuta et al., 2014; Agarry and Lekwot 2010) Bauchi (17.2%) as reported by Ndako et al., (2012) and Markurdi (11.0%), Ado-Ekiti (4.0%) as reported by Mbaawuaga et al., (2008) and Awoleke (2012) respectively. Though these

studies were all conducted in Nigeria and are within what was recorded in National Spot surveys which ranged between 2.2% and 15.1% among pregnant women. HBV infection prevalence rate in Sub-Saharan Africa is put at between 9 and 20% (Kiire, 1996). This diversity might have resulted from many factors among which is cultural background and prevailing social activities of the studied population. This study was done in a semi-urban settlement while all other reported studies were done in urban settlements with high social life and little or no cultural restrictions. Ignorance about the route of infection might be responsible for the prevalence recorded in HBV infection as observed by Kuta et al., (2012) in a study in Niger State. The highest HBV infection was recorded among age group 31-40 which agrees with the works of Awoleke (2012) and Mbaawuaga et al., (2008) but at variance with reports by Kuta et al., (2014) and Ndako et al., (2012) who reported ages 41-50 and 20-29 respectively. Early marriage, exposure and environmental factors could be responsible for the noticed variation. Recent study by Dionne-Odom et al., (2016) reported HBV prevalence of 2.9% among pregnant women in Cameroon, a neighbouring country to Nigeria. Prevalence of HCV (0.7%) was relatively low when compared with 3.6% reported in Benin by Ughebor et al (2011), and this might explain why it is not often screened for. However, the detection of 3 cases in this study points to its possible spread. Multiple sexual partners was responsible for the highest risk factor. This is expected as sexual intercourse is one of the major means of infection to all the viruses under investigation. Tattooing is rapidly gaining relevance in the fashion world and has become a risk factor that should be urgently looked into and be considered when developing control measures against most viral infections. Three cases of co-infected individuals were recorded in this study. This is not surprising since both HIV and HBV shared the same route of transmission. However, these co-infected patients are at increased risk of liver related problems (Maria et al., 2007) The prevalence of co-infection in Abidjan, a neighbouring country, was 9.0% among pregnant women. This sharp difference in regional prevalence might be culturally influenced and however calls for more collaborative regional studies (Rout et al, 2004, Lara et al., 2012).

CONCLUSION

This study reported prevalence of 2.6%, 1.9% and 0.7% for HIV, HBV and HCV infections respectively forming a basal data for other studies. Though, co-infection among the viral agents was low in this study, there is great tendency for increase with its attending health implications. The multiplication effect of infected pregnant women in the studied community can be reduced or eliminated with early detection of infection through screenings like this. The authors therefore advocate for reduced or totally subsidized cost of screening, compulsory immunization and aggressive enlightenment campaign about mode of transmission by all concern authorities. The authors intend to increase the scope of this study to cover the entire three geographical zones of Ondo State.

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