PREVALENCE OF HUMAN IMMUNODEFICIENCY VIRUS, HEPATITIS B VIRUS, HEPATITIS C VIRUS AND SYPHILIS AMONG PREGNANT WOMEN IN ABULE-EGBA, LAGOS STATE

Abstract

Human Immunodeficiency Virus (HIV), Hepatitis B Surface Antigen (HBsAg), Hepatitis C Virus (HCV) and Syphilis (VDRL) infections are common among pregnant women and it poses a major risk to the fetus due to vertical transmission. The aim of this study was to determine the sero-prevalence of HIV, HBsAg, HCV and VDRL infection among pregnant women in Abule-Egba, Lagos State. A total of 150 pregnant women in Abule-Egba, Lagos state were screened for HIV, HBsAg, HCV and VDRL. Prior to the collection of their blood samples, counselling session was held with every subject so as to give them information about what the test entails. 5 milliliter of blood sample was collected from each subject, centrifuged at 3,000rpm for 10 minutes and the plasma was used to determine the sero-prevalence of HIV, HBsAg, HCV and VDRL using test kits. Post-test counseling was also carried out on all the subjects after the release of their results. The data gotten was analyzed by using SPSS version 20. The age of the subjects range from 21 to 50 years old with a mean age of 31.54 ± 4.860. Sero-prevalence of HIV, HBsAg, HCV and VDRL were found to be 0.7%, 3.3%, 1.3% and 0.7% respectively. HIV, HBV, HCV and VDRL infections among pregnant women are major public health problem, future intervention to reduce the vertical transmission should include early screening of these diseases in pregnancy and provision of preventive measures.

Keywords: Antigen, pregnant, sero-prevalence, Syphilis, transmission.

Introduction

Human immunodeficiency virus (HIV) is a virus that attacks cells (white blood cells which are called T-helper cells or CD4 cells) that help the body to fight infection, making a person to be more vulnerable to other infections and diseases (Uneka *et al.,* 2007). Epidemiological data has shown that HIV remains a public health issue that persistently drains our economic sector, having claimed more than 25 million lives over the last three decades (WHO Fact sheet, 2014). Recently, it is estimated that about 3,229,757 people live with HIV in Nigeria and about 220,393 new HIV infections occurred in 2013 and 210,031 died from AIDS related cases. HIV is transmitted through body fluids that include blood, semen, vaginal, rectal fluids and breast milk. HIV infection in pregnancy is associated with adverse maternal and fetal outcomes (Oladeinde *et al.,* 2011). The risk of HIV transmission from mother to child is approximately 45% if no safety measures have been taken. The effects of HIV among pregnant women include infectious morbidity, vertical transmission and severe anaemia (Behets *et al.,* 2008). With early HIV testing, special precautions during delivery, prophylactic treatment and shortened breast feeding, the risk can be reduced to the barest minimum (Unicef, 2010).

Hepatitis B infection is caused by the hepatitis B virus (HBV), an enveloped DNA virus that infects the human liver and causes hepatocellular necrosis and inflammation. It is transmitted by exchange of saliva during kissing with an infected person, exposure to infectious blood or body fluids, unproctected sexual contact, blood transfusion, re-use of contaminated needles and syringes, vertical transmission from an infected mother to child (Petersen *et al.,* 1976) during child birth, breastfeeding and through the placenta (Krajden *et al.,* 2005). Other persons who are at high risk include persons with multiple heterosexual partners, homosexuals and health care workers (McMahon *et al.,* 1955). HBV can also be transmitted between family members within households, possibly by contact of non-intact skin or mucous membrane with

secretions or saliva containing HBV (Petersen *et al.,* 1976). Hepatitis B virus infection generally can be detected through the 3 parts hepatitis B blood panel. These include hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (HBsAb or anti-Hbs) and hepatitis B core antibody (HbcAb or anti-HBC) (Hepatitis B foundation, 2010) HBV infection can be acute or chronic, acute hepatitis B causes symptoms to appear quickly in adults. Infants infected at birth rarely develop only acute hepatitis B. nearly all hepatitis B infections in infants go on to become chronic. Chronic hepatitis B develops slowly. Symptoms may not be noticeable unless complications develop. Acute hepatitis B infection is usually a self-limiting disease marked by acute inflammation and hepatocellular necrosis with a case fatality rate of 0.5-1% (Lavanchy, 2004). Most hepatitis B related deaths were due to liver cirrhosis, followed by primary liver cancer i.e hepatocellular carcinoma (Ringehan *et al.,* 2017). Testing for HBV infection among pregnant women is very important because of the mortality and morbidity of the host (pregnant women), its effects on the process of parturition, and the risk of vertical transmission from mother to child (Kane, 1995).

Hepatitis C virus (HCV) is a RNA virus which is known to infect humans. It is often transmitted pareterally but is also transmitted vertically and sexually (Owusu-Ofori *et al.,* 2005). HCV is up to 4 times more infectious than Human Immunodeficiency Virus and it requires less exposure than HIV to cause infection (Te and Jensen, 2010). The estimated prevalence of HCV in Africa is 5.3% (Pybus *et al.,* 2003). Egypt has the highest worldwide prevalence (17.5%). The prevalence of HCV increases with age, with the highest rate being reported in the age group older than 40 years (Maheshwari and thuluvath, 2010). The routes of transmission of HCV are blood, blood products, tissue and organs transplant, unsafe medical procedure, health care exposure e.g needle stick injury (Xia *et al.,* 2008), intravenous drug use (Tohm and Holmberg, 2010), sexual transmission (Jafari *et al.,* 2010), body piercings (Lam *et al.,* 2010) and vertical transmission (Owusu-Ofori *et al.,* 2005).

Syphilis is one of the most imperative sexually transmitted infections, which is caused by spirochete *Treponema pallidum,* which is a significant public health issue (Lynn and Lightman, 2004). Research has shown that about 10million people are infected with syphilis worldwide

(Lynn and Lightman, 2004). Annually, about 2 million pregnant women are estimated to have active syphilis infection (Arnesen *et al.,* 2015). Syphilis is transmitted via sexual contact or from mother to child during pregnancy or delivery (Gomez *et al.,* 2013). Prevalence rate of syphilis infections among pregnant mother differs between countries and regions depending on a number of factors such as the national HIV prevalence and culture of the general population. Untreated syphilis is a significant cause of morbidities and mortalities in pregnant women. Maternal syphilis results in abortion, still births, non-immune hydrops, intra-uterine growth restriction, peri-natal death and congenital syphilis and this remains an increasing problem in many countries of sub-saharan Africa (De Santis *et al.,* 2012). Pregnant women who are at increased risk for syphilis infection include uninsured women, sex workers, illicit drug users, women living in poverty and women that live in communities with high syphilis morbidity (Scultz *et al.,* 1990)

MATERIALS AND METHOD

Study Area (Site)

This is a cross sectional study, conducted among pregnant women who live in Abule-Egba, Alimosho Local government area of Lagos State.

Inclusion Criteria

Subjects that fulfilled the following criteria were included in this study:-

1. Subject for this study included pregnant women only
2. Those that consented to participate in the study.

Exclusion Criteria

Subjects with the following criteria were excluded from this study:-

1. Subjects that are not pregnant.
2. Pregnant women who did not consent to the study

Ethical consideration

The participation of subjects in this research was voluntary, and the principle of patient confidentiality was strictly adhered to. Each participant was duly counselled and a prepared consent form was signed by each of the subjects.

Sample Collection

5mls of venous blood sample was collected from each of the subjects and was transferred into an EDTA bottle, which was sent to the laboratory. The collected blood samples were spun with a macro-haematocrit centrifuge at 3,000rpm for 10 minutes; subsequently the plasma was transferred into a plain bottle which was used to conduct the test for HIV, HbsAg, HCV and VDRL.

Detection of HIV

The HIV screening for all the subjects was examined by using rapid test diagnostic kits. This was done with the use of Determine kit, because of its high sensitivity (100%) and specificity (99.6%). Positive presumptive diagnosis test were further examined using Uni-Gold test kit and if positive at this point, the result would remain as positive but if otherwise, a confirmatory test can be carried out by using Stat-Pak as recommended by the National Agency for Control of AIDS (NACA).

Medical Laboratory Diagnosis of HBsAg, HCV and VDRL

Laboratory diagnosis for HBV and HCV analyses were carried out by using HBsAg and HCV antibody test strip produced by Abon Biopharm (Hangzhou) co., Limited. While that of VDRL was conducted by using Acon ultra Rapid Syphilis test strip (Acon Laboratory Inc, USA). The test was carried out at room temperature and according to the manufacturer's specification. The test strip was removed from its package and then immersed vertically into the serum for 20 seconds which was later placed on a non-absorbent flat surface. It was observed for 15 minutes, the control line showed before any test was validated.

Counseling Session

Before the commencement of the screening, there was pre-test counseling session which was handled by the counselors. The subjects were sensitized, informed and enlightened about the importance of the screening test, and they were made to understand the possibly outcome of the result of the screening test. Every subject recruited for this study was made to understand that each test can have a positive or negative impact on their fetus, themselves and the family at large if the preventive and precautionary measures are not put into consideration. After the conduct of each test, a post –test counseling session was carried out, in which individual result was shared confidentially to each subjects and those that were tested positive to any of the screening test were advised to visit any of the government hospitals for treatment.

Statistical Analysis

All the data gotten from this study were entered into and analyzed using SPSS version 20. Data were reported as frequency table distribution, percentage, student t-test and chi-square.

Results

Table1.0 Age Range of subjects

Age Range	**Frequency (%)**
21-25	12 (8)
26-30	52 (34.7)
31-35	60 (40)
36-40	19 (12.6)
41-45	4 (2.7)
46-50	3 (2)
Total	**150 (100)**

Table 2.0 showing the mean and standard deviation of the age of subjects

Parameters	Mean ± STD	t test	P value
Age	31.54 ± 4.860	79.483	0.0001*

Table 3.0 Different screening parameters and their prevalence

Parameters	Results		Total (%)	P-value
	Negative (%)	Positive (%)		
HIV	149 (99.3)	01 (0.7)	150 (100)	0.183
HbsAg	145 (96.7)	05 (3.3)	150 (100)	
HCV	148 (98.7)	02 (1.3)	150 (100)	
VDRL	149 (99.3)	01 (0.7)	150 (100)	

Table 4.0: showing HIV, HBsAg, HCV and VDRL results among pregnant women in various age groups

	Age Group (years)							
	21-25	26-30	31-35	36-40	41-45	46-50	Total	P Value
HIV	NEG=12 POS=0 Total=12	NEG=51 POS=1 Total= 52	NEG=60 POS=0 Total=60	NEG=19 POS=0 Total=19	NEG=4 POS=0 Total= 4	NEG=3 POS=0 Total=3	149 1 150	0.863
HbsAg	NEG=12 POS=0 Total=12	NEG=49 POS=3 Total=52	NEG=58 POS=2 Total=60	NEG=19 POS=0 Total=19	NEG=4 POS=0 Total=4	NEG=3 POS=0 Total=3	145 05 150	0.218
HCV	NEG=12 POS=0 Total=12	NEG=52 POS=0 Total=52	NEG=59 POS=1 Total=60	NEG=18 POS=1 Total=19	NEG=4 POS=0 Total=4	NEG=3 POS=0 Total=3	148 02 150	0.663
VDRL	NEG=12 POS=0 Total=12	NEG=51 POS=1 Total=52	NEG=60 POS=0 Total=60	NEG=19 POS=0 Total=19	NEG=4 POS=0 Total=04	NEG=3 POS=0 Total=3	149 01 150	0.863

NEG = NEGATIVE

POS = POSITIVE

Discussion

In this study, we conducted an epidemiological assessment of HIV, HbSAg, HCV and VDRL among 150 pregnant women living in Abule-Egba, Alimosho Local Government area, Lagos state. The ages of the subjects range from 21 - 50 years old with a mean age of 31.54 ± 4.860. According to this study, 12(8%) of the subjects range in ages between 21-25 years old, 52(34.7%) range in ages between 26-30 years old; 60(40%) range in ages between 31-35 years old; 19(12.6%) range in ages between 36-40 years; 4(2.7%) range in ages between 41-45 years old while 3(2%) range in ages between 46-50 years old.

Pregnant women remain the most vulnerable high risk population to the devastating impact of the HIV generalized epidemic in Nigeria. Over the past 5 decades, studies have revealed that pregnant women have been particularly vulnerable and severely affected with HIV; this can be due to the compromised state of their immunity, risk of transmission from most recent partners and onward transmission to unborn child (Awofala and Ogundele, 2016). The number of pregnant woman in Abule-Egbe, Lagos State, who tested positive to HIV was not significantly raised when compared with the number of pregnant women that tested negative to HIV in Abule-Egbe, Lagos State (P=0.863). According to our study, the overall prevalence estimate of HIV among pregnant women in Abule-egba, Lagos State was 0.7%. When compared to a similar study conducted of recent by National HIV prevalence among pregnant women in Lagos State, they recorded a prevalence of 2.9% (CIA world factbook, 2018) which was higher than ours. Another recent study by Glory *et al.,* 2018 recorded an overall prevalence of 5.2% among pregnant women in Lagos and its environs. HIV prevalence in our study was lower than the 2010 National ANC average HIV prevalence rate of 4.1% in pregnant women (Bashorun *et al.,* 2014).

The prevention of HBV infection among pregnant women should be a major concern to every nation. Centres for disease control (CDC) and many others important health agencies have all strongly recommended universal HBsAg screening for pregnant women to prevent perinatal HBV transmission and mother-to-child infection of HBV (Campbell *et al.,* 2006). In this study, HBsAg did not reveal statistical significant sero-positivity (P=0.218) among the pregnant women studied. The sero-prevalence rate of HBV infection in this study was 3.3% which is comparable

with a similar study carried out by other researchers, who recorded a prevalence of 4.6% in Enugu; 4.3% in Port-harcourt city (Akani *et al.,* 2005) and a prevalence of 2.2% reported in Benin City but lower than a prevalence of 6.08% reported in Lagos State Nigeria (Rabiu *et al.,* 1989). An important concern demonstrated in this study was that subjects that tested positive to HBsAg were within the age range of 26-30 years old and 31-35 years old which are within the youthful age. This can be as a result of their refusal to take HBV vaccine prior to when they were exposed to the virus. Immunization has been found to be the most effective way of controlling the virus (Emechebe *et al.,* 2009).

The prevalence of HCV (1.3%) in this study did not reveal statistical significant sero-positivity (P=0.663) among the pregnant women studied, when compared with similar studies carried out by Buseri *et al.,* 2010, who revealed the prevalence of 0.5% among pregnant women in Yenagoa, Bayelsa State and 1.5% among pregnant women attending the uniabuja teaching hospital, Gwagwalada, Nigeria (Buseri *et al.,* 2010). In this study, it was observed that Subjects that tested positive to HCV were within the age range of 31- 35 and 36-40 years old.

Syphilis is one of the sexually transmitted diseases that is prevalent in developing countries and is of public health importance. Studies have revealed that it can cause fetal defects if not treated. The prevalence of Syphilis (0.7%) in this study did not reveal statistical significant sero-positivity (P=0.863) among the pregnant women studied, which is lower than a prevalence of 2.28% recorded by Azuonwu, 2020, who carried out a similar study among pregnant women visiting a health facility in Rivers State. Opone *et al.,* 2019 also recorded a prevalence of 1.98% among pregnant women in Akwa Ibom State, Southern Nigeria. Similarly, at the University of Ilorin Teaching Hospital, in North Central Nigeria, a prevalence of 1.76% was recorded among ante-natal clinic attendees (Aboyeji and Nwabuisi, 2003). Pregnant women who are at high risk of syphilis infection include women living in poverty, drug users, sex workers, uninsured women and women in communities with high syphilis morbidity. Studies have shown that screening test can detect syphilis infection (Schultz *et al.,* 1990).

Generally, this study did not reveal statistical significant sero-positivity to HIV, HBsAg, HCV and VDRL (P=0.183) among the pregnant women in Abule-Egba, Lagos State.

Conclusion

According to our study, the prevalence of HIV was 0.7%, HBsAg was 3.3%, HCV was 1.3% and VDRL was 0.7. This shows that these infections (HIV, HBsAg, HCV and VDRL) still remain significant public health problems in our society. Therefore there should be more health education about these infection and its risk factors.

Conflicts of Interest: The authors declare that this manuscript was approved by all the authors in its form and that no competing interest exists.

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