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Annals of Biological Research, 2013, 4 (2):141-145
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Seroprevalence of some sexually transmitted infections among antenatal attendees in university of Maiduguri teaching hospital, Maiduguri-Nigeria

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ABSTRACT

Seroprevalence of Immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and Syphilis infections among pregnant women have been reported to be more common in Africa and Asia. This present retrospective study reports the seroprevalence of HIV, HBV, HCV and Syphilis among antenatal attendees in UMTH, Maiduguri-Nigeria. A total of 1105 pregnant women were tested for HIV, HBV, HCV and Syphilis. Eighty-three of them (7.5%) were positive for HIV, this was followed by HBsAg with 76(6.9%) while the least was syphilis with 5(0.5%). The highest percentage prevalence for HIV infection was found in the age group 15-20years with 17(12.4%) while for HBV was found in age group 21-25years with 31(1.7%). HCV highest percentage positivity was found in 31-35years age group with 5(2.6%). The elderly pregnant women aged 46 – 50years were the lowest with no cases for any of the infections. Of the 1105 pregnant women tested, 11 (0.01%) had multiple infections. Of the 11 multiple infection, 9 (0.8%) were infected with HIV and HBV while 0.2% were infected with HIV and HCV. There was no co-infection of HBV and HCV, syphilis and HIV, HBV, HCV. Our study showed that it is very imperative for all pregnant women to be requested to test for HBV HCV alongside the conventional syphilis and HIV, infections to prevent them from infecting their unborn babies.

Keywords: HIV, HBsAg, HCV, Syphilis co-infection, pregnant women, Maiduguri.

INTRODUCTION

According to UNIADS epidemiological report, 33 million people are infected with the human immunodeficiency virus (HIV) worldwide, 18 million of which are women (WHO 2010). The greater percentage of this population is found in developing countries of Africa and Asia.

Pregnant women are a sentinel population and the introduction of the highly active antiretroviral therapy (HAART) to pregnant women increases life expectancy as well as reduces the rate of mother-child-transmission of HIV.

However, the efficacy of HAART is compromised when the patients are co infected with other viruses such as hepatitis B virus (HBV), hepatitis C virus (HCV) and/or with *Treponema pallidum* the etiologic agent of syphilis.

HIV and these other pathogens share major routes of transmission especially the heterosexual route and mother-to-child transmission is the next most important route of transmission (Ajayi *et al*, 2012; Drosten *et al*, 2004; Murray *et al*, 2002; Finlayson *et al*, 1999; Alvarez-Munoz *et al*, 1997). Mother-to-child transmission of syphilis leads to severe morbidity and mortality including abortion, intrauterine and neonatal death (WHO, 2003). Congenital syphilis is still common in developing countries of the world due to non compliance of women to antenatal care or non inclusion of syphilis screening as a component in antenatal care (Stamm, 2010; Kent and Romanelli, 2008; Schmid, 2004).

In 2007, Polis *et al* suggested that HIV-HCV co infection in pregnant women increases the rate of mother-to-child transmission of HCV to the infants. The prognosis of syphilis may also be altered by co infection with HIV (Thorne *et al*, 2008; Mwapasa *et al*, 2006).

Seroprevalence of HIV, HBV, HCV and syphilis co infections is reported to be more common in developing countries (Munshi *et al*, 2008; Sahaf *et al*, 2007; Forbi *et al*, 2007; Kilani *et al*, 2007; Waddell *et al*, 2006). In Nigeria, data on this trend of co infection is sparse. The prevalence of HIV-HCV co infection was reported as 6.2% in Kano and 12.5% in Abuja (Emokpae *et al*, 2008). In Keffi, the prevalence of HIV-HCV co infection was reported as 11.1% but with a higher prevalence (20.6%) among persons with HIV-HBV co infection (Forbi *et al*, 2007). A study in Abuja reported seroprevalence of 7.1% for HIV-HBV co infection and 2.4% for HIV-HCV co-infection with an overall seroprevalence of 9.5% for HIV and HBV or HCV co infections (Bassey *et al*, 2009).

Nnoroka and Ezeoke reported a prevalence rate of 2.1% for HIV-syphilis co infection in Enugu (2005) while Forbi *et al*, (2009) reported a rate of 3.3% in HIV-syphilis co-infection with 1.3% in the female population. These works were done in a general population with no specific focus on the pregnant women.

Although data on HIV-syphilis co- infection is generally scarce, there is little or no data on the co - infections of HIV with HBV, HCV and syphilis especially among pregnant women particularly from north eastern Nigeria. Paucity of data will lead to inability to check and manage the devastating effects of these co infections which will result in complications of childbirth as well as neonatal infections thus working against achieving the MDGs on maternal and child health. Therefore, this study was carried out in order to assess the Seroprevalence of HIV, HBV, HCV and Syphilis co- infections among Pregnant Women in University of Maiduguri Teaching Hospital, north eastern Nigeria.

MATERIALS AND METHODS

STUDY AREA

The study was conducted among pregnant women attending the antenatal clinic of the University of Maiduguri Teaching Hospital. As a routine all pregnant women attending the clinic are counseled for HIV. Their consent was further sort to participate in the study. A total number of One thousand One hundred and Five (1105) pregnant women that were counseled and consented were bled for the study. The study was carried out between January and October 2009.

Sample Collection

Five milliliters (5ml) of venous blood was collected from each patient using plain vacutainer tubes. Samples were allowed to clot and centrifuged at 1000xg for 10minutes. Serum samples were separated into sterile 2ml cryovial containers and stored at -20^{o}C until ready for use.

HIV SEROLOGY

HIV screening was carried out using the rapid serial testing algorithm National Testing algorithm(FMOH, 2010). Samples were first tested using Determine HIV kit (Alere Medical Co.,Japan). Only positive samples were further tested using Uni-gold HIV kit (Trinity Biotech Plc, Ireland) and those found positive, were presumptively considered as positive. If the second line test using unigold is negative, then a tie breaker using Stat pak HIV kit (CHEMBIO,USA) was used. All test kits procedures were done according to their respective manufacturers.

SYPHILIS IgM SEROLOGY

Screening for syphilis was carried out using Enzyme Immunoassay (ELISA) technique to determine specific IgM antibodies to *Treponema palladium* in human serum and plasma (DIA.PRO Diagnostic Bioprobes, Milano-Italy). The samples were tested using the manufacturer instructions and was read with a spectrophotometer (name and country of manufacture) at dual wave lengths (450 and 620nm).

HEPATITIS B AND C SEROLOGY

Hepatitis B virus infection was detected using the commercially available rapid test strip which is a qualitative lateral flow immunoassay kit for testing HBsAg in serum and plasma (Acon Laboratories, Inc., San Diego, USA). Similarly, Hepatitis C virus infection was tested using the commercially available rapid test strip which is a qualitative, membrane (coated with recombinant HCV antigen on the test line region of the strip) based immunoassay for the detection of HCV antibodies in serum and plasma (Acon Laboratories, Inc., San Diego, USA).

RESULTS

Table 1 shows the percentage positivity of HIV, HBV, HCV and syphilis in pregnant women in Maiduguri. Of the overall, 1105 pregnant women tested, 83 (7.5%) were positive for HIV, followed by HBsAg 76(6.9%) while syphilis was 5(0.5%).

Table 2 indicates age specific distribution of pregnant women infected with HIV, HBV, HCV and Syphilis. The highest percentage prevalence for HIV infection was found in the age group 15-20years with 17(12.4%) and that of HBV was found in the age 21-25 with 31(10.4).

Table 3 shows the various combinations of multiple infections in pregnant women. Of the 1105 pregnant women tested, 11 (0.1%) had multiple infections. Of these, 9 (0.8%) were infected with HIV and HBV while 2 (0.2%) were infected with HIV and HCV.

Table 1: Percentage positivity of HIV, HBV, HCV and Syphilis among pregnant women in Maiduguri (n=1105)Comment: Move tables to the end, after reference except a place specified by your journal

Test	No. Tested	No. Positive (%)	No. Negative (%)
HIV	1105	83 (7.5)	1022 (92.5)
HBsAg	1105	76 (6.9)	1029 (93.1)
HCV	1105	18 (1.6)	1087 (98.4)
Syphilis	1105	5 (0.5)	1100 (99.5)

Table 2: HIV, HBV, HCV and Syphilis positive cases in different age groups

		No. Positive (%)			
Age group (yr)	**No. Tested (%)**	**HIV (%)**	**HBsAg (%)**	**HCV (%)**	**Syphilis (%)**
15 – 20	137 (12.4)	17 (12.4)	11 (8.0)	2 (1.5)	0 (0)
21 – 25	299 (27.1)	22 (7.4)	31 (10.4)	5 (1.7)	1 (0.3)
26 – 30	307 (27.8)	17 (5.5)	14 (4.6)	4 (1.3)	4 (1.3)
31 – 35	196 (17.8)	15 (7.7)	9 (4.6)	5 (2.6)	0 (0)
36 – 40	97 (8.9)	9 (9.3)	10 (10.3)	1 (1.0)	0 (0)
41 – 45	62 (5.5)	3 (4.8)	1 (1.6)	1 (1.6)	0 (0)
46 – 50	7 (0.6)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL	1105	83 (7.5)	76(6.9)	18 (1.6)	5 (0.5)

Table 3: Multiple infections among pregnant women in Maiduguri

Infections	No.	%
HIV and HBV	9	0.8
HIV and Syphilis	0	0
HIV and HCV	2	0.2
HBV and HCV	0	0
HBV and Syphilis	0	0
HCV and Syphilis	0	0
TOTAL	11	1.0

DISCUSSION

The seroprevelance of HIV, HBV, HCV and Syphilis infections is well recognized worldwide but has been reported to be more common in developing countries in Africa and Asia (WHO, 2001 and Sheffield , 1999). This study was carried out to assess the seroprevalence of HIV, HBV, HCV and Syphilis co infections among pregnant women attending University of Maiduguri Teaching Hospital, Northeast Nigeria. The study demonstrated a high prevalence of HIV (7.5%) and HBV (6.9%) and a low prevalence of HCV (1.6%) and Syphilis (0.5%). The HIV prevalence of 7.5% in this study indicates there is a rise in the proportion of pregnant women infected when compared with 0.8% from a similar retrospective study earlier carried out in the same hospital between 2005 and 2008.(Ajayi *et al., 2012*). The findings where the majority of pregnant women tested were between the age bracket of 15 -35 is also in agreement with an earlier report by Ajayi et al 2012 and national survey (FMOH 2002) that the majority of the pregnant women tested (85%) were between the ages of 15-35 years.

Hepatitis infection has been documented as the most common cause of jaundice in pregnancy and is thought to be transmitted primarily at the time of delivery (Silverman, 2009). However, vertical transmission is an effective route of neonatal infection and has been suggested that approximately 10 to 85% of infants born to Hepatitis B surface antigen (HBsAg) positive mothers will become infected (Lavanchy, 2004 and Silverman , 2009). In this study,6.9% of the pregnant women tested were positive for HBsAg. This finding is lower than an earlier report by Harry et al. (1994) who reported 11.6% in the same study area but higher than 3.8% reported by Bassey et al. (2009) in Abuja, Northcentral Nigeria. This study revealed that the highest prevalence for HBsAg was in the age group of 21 -25 years as was similarly observed in both HIV and HBV in the Abuja study . The study shows that multiple infections with HIV and HBsAg are common even though no statistical significance was noted in this study ($p>0.05$).

The seroprevalence of 1.6% obtained in this study for HCV is in agreement with reports among pregnant women in Abuja, Northcentral Nigeria with similar low prevalence of 1.6%. Equally, reports from Europe, Japan and the United States also showed lower prevalence (Zanatti et al.,1999).). In this study, there was no co-infection observed between HCV and HBsAg, and HCV and Spyhilis.

The Syphilis ELISA technique used has shown the minimal percentage positivity of 0.5% as compared to other sexually transmitted infections in this study. However, the 0.5% positivity reported in this study is higher than that earlier reported in the same facility which gave a positivity of 0.05% (Bukar *et al., 2009). The study however* agrees with a report of 0.4% from the eastern part of Nigeria (Ghatoro and Abedi, 2000). and lower than the reports in Ilorin 1.7%, Ibadan 1.55%, and Abuja (Aboyeji and Nwabuisi 2003, Adewole *et al*, 1997 and Agboghoroma *et al, 2000*). The screening of syphilis in pregnant mothers cannot be over emphasized as infection with syphilis may result in stillbirth, intrauterine growth, retardation, non-immune hydrops, premature labour and congenital syphilis (Isada and Grossman, 1998). This study revealed that there was no multiple infection between HIV and Syphilis, HBV, HCV and syphilis. This could be attributed to the low percentage of syphilis positivity of 0.5% found in this study.

Acknowledgement
The authors are thankful to Solawunmi Enterprises Limited, Lagos, Nigeria for donating, the Syphilis IgM ELISA kit used for this study.

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