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Nijerya Abaji Bölgesi Kırsal Toplumunda, Gebe Kadınlar Arasında, İnsan İmmün Yetmezlik Virüsü, Hepatit B ve C Sero-epidemiyolojisi

[Sero-Epidemiology of Human Immunodeficency Virus, Hepatitis B and C among Pregnant Women in Rural Communities of Abaji Area Council, Nigeria]

ÖZET

AMAÇ: HIV enfeksiyonu dünya çapında ve özellikle de Sahraaltı Afrika'da önemli halk sağlığı sorunu olmaya devam etmektedir. En yüksek HIV yükünün bu bölgeye loklaize olduğu rapor edilmektedir. HIV özellikle anneden yenidoğana geçme yeteneğine sahiptir. *Hepatit B (HBV)* and *hepatit C (HCV)* son zamanlarda dünya geneleinde doğum merkezlerinde gebe annelerde mortalite nedeni olarak dikkat çekmektedir. Bu enfeksiyonların tehlikeli doğası ve Nijerya'nın kırsal bölgelerindeki antenatal kliniklere devam eden gebe kadınlar arasındaki prevalansı ile ilgili raporlardaki eksiklik nedeni ile; bu çalışma, serolojik teknikler kullanılarak, HIV, HBV ve HCV antikorlarının Abaji Genel Hastanesine Abaji'nin kırsal bölgelerinden gelen gebe kadınlar arasındaki prevalansını saptamaya odaklanmıştır.

YÖNTEM: Bu çalışma 1 Nisan 2010-30 Mart 2011 tarihleri arasında Abaji Genel Hastanesinin antenatal kliniğine devam eden 395 gebe kadını kapsayan kesitsel bir çalımadır. Bakım personeli tarafından uygulanan soru formu biyolojik veriler ile sosyoekonomik ve demografik durum hakkında bilgi toplamak için kullanıldı. HIV, HBV ve HCV antikorlarını taramak için hızlı tanı kitleri kullanıldı. İstatistiksel analizler SPSS version 16 kullanılarak yapıldı.

BULGULAR: 395 gebe kadının 23 (%5,8), 45 (%11,4) and 12 (%3,0)'sinde sırasıyla HIV, HBV ve HCV'ye karşı serum antikorları pozitif bulundu. 22-26 yaş grubu tüm serolojik markırlara göre en fazla enfekte olan ve seropozitiflik gösteren gruptu. Cinsel yolla bulaşan hastalık öyküsü ($p<0.001$) ve çoklu cinsel partner ($p=0.01$) HIV ile enfekte olmada anlamlı etkenlerdi. Çalışılan hiçbir risk faktörü (Dövme yaptırma, kan transfüzyon öyküsü, çoklu cinsel partner, eğitim durumu, cinsel yolla bulaşan hastalık öyküsü, diş tedavisi ve geleneksel korkular) HCV seropozitifliği ile anlamlı ilişki göstermedi.

SONUÇ: Çalışma, gerçekleştirildiği kırsal topluluklarda HIV, HBV ve HCV'nin durumunu ortaya koymaktadır. Çalışmanın yapıldığı toplumda sözü geçen viral enfeksiyonların yüksek prevalansta bulunduğunu götermektedir. Kırsal topluluklarda bu enfeksiyonların artan prevalansını uygun ve zorunlu izleme programı ile önlemek acil bir ihtiyaçtır.

SUMMARY

AIM: *Human immunodeficiency virus* (HIV) infection continues to be a major public health problem worldwide and most especially in sub Saharan Africa .It has been reported that the highest burden of HIV is located in this region. HIV is particularly significant in their ability of transferred from mother to their newborn. *Hepatitis B* (HBV) and *hepatitis C* (HCV) is recently been recognized also as a cause of mortality and morbidity in pregnant women in many obstetric centers worldwide. In view of the deleterious nature of these infections and paucity of reports on their prevalence among pregnant women attending antenatal clinics in rural settings in Nigeria, This study thus aimed to evaluate using serological techniques, the prevalence of HIV, HBV and anti-HCV antibodies among pregnant women attending the General Hospital, Abaji from various rural communities of Abaji local Area Council, of the federal capital city, Nigeria.

METHOD: The study was a hospital based cross-sectional survey including 395 pregnant women attending the antenatal clinic of the General Hospital, Abaji, from 1st April 2010- 30th March 2011. Questionnaires administered by a nursing staff were used to gather information on bio-data, socio-economic and demographic status. Rapid diagnostic test kits were used to screen for HIV, HBV and anti-HCV antibodies. Statistical analysis was carried out using the SPSS software version 16.

RESULTS: 23(5.8%), 45 (11.4%) and 12 (3.0%) out of 395 pregnant women included in the study were found to be positive for Serum antibodies to HIV, HBV and HCV respectively. The age group 22-26 was the most infected and showed highest seropositivity to all serological markers. History of sexually transmitted diseases (STI) ($p<0.001$) and multiple sexual partners ($p=0.01$) were significant factor in the acquisition of HIV. While Tattooing and multiple sexual partners proved statistically to play a role in seropositivity to HBV ($p=0.01$, $p<0.001$). None of the studied risk factors (Tattooing, History off blood transfusion, v 'multiple sexual partners, educational status, history of STI, dental maneuvers and traditional scares) had a significant association on HCV seropositivity.

CONCLUSION: The study presents the situation of HIV, HBV and HCV in the rural communities studied. It was observed that there exists a high prevalence of these viral infections amongst pregnant women in the communities studied. There is an urgent need to stem the growing prevalence of these infections in these rural communities, which is presently in a manageable state by proper and mandatory screening for these infections.

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Anahtar Kelimeler:
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INTRODUCTION

Human immunodeficiency virus (HIV) infection continues to be a major public health problem worldwide and most especially in sub Saharan Africa .It has been reported that the highest burden of HIV is located in this region (1). It has been estimated that about 3.6% of Nigeria's total population are living with HIV and AIDS (2). Approximately 220,000 people died from AIDS in Nigeria in 2009 (3). With AIDS claiming so many lives, Nigeria's life expectancy has declined significantly. In 1999 the average life expectancy was 54 years for women and 53 years for men (4). In 2009 these figures had fallen to 48 for women and 46 for men (5).

Mother to child transmission (MCT is a major route of transmission of HIV after Heterosexual routes and Blood transfusions (5). Each year around 57000 babies in Nigeria are born with HIV (6). Recent estimates reports that 360000 children are living with HIV in Nigeria, with their mothers being source of infection (7). Mother to child transmission of HIV occurs during pregnancy, labor, delivery or breastfeeding. MCT can be tamed by the administration of antiretroviral agents to the mother during pregnancy and labor and to the new born during the first weeks of life (8). Recently the World health Organization has recommended mothers who are known to be HIV positive and their children HIV uninfected or status unknown should breastfeed their infants for six months of life exclusively (9).

Hepatitis is an inflammation of the liver characterized by the presence of inflammatory cells in the tissue of the organ. It may occur with limited or no symptoms, but often leads to jaundice, anorexia (poor appetite) and malaise. Hepatitis is acute when it lasts less than six months and chronic when it persist longer (10). A group of viruses known as the hepatitis viruses cause most cases of hepatitis worldwide, but it can also be due to toxins (notably alcohol, certain medications and plants), other infections and autoimmune diseases (11). Viral hepatitis during pregnancy is associated with high risk of maternal complications. There is a high rate of vertical transmission causing fetal and neonatal hepatitis which can have serious effects on the neonate, leading to impaired mental and physical health later in life. A leading cause in maternal mortality (12) is also said to be the most familiar cause of jaundice in pregnancy (13). Peri-natal transmission of this disease occurs if the mother has had acute Hepatitis B infection during late pregnancy, in the first postpartum or if the mother is a chronic HBsAg carrier (14).

HIV –Hepatitis co-infection during pregnancy is highly deleterious. Chronic infections are often found in approximately 30% of HIV - positive people and chronic hepatitis B in 10%; triple infection with all three viruses occurs in about 1% of HIV –infected persons (15). Management of HIV - infected patients with HBV or HCV co-infection often poses great challenges to the clinician, HIV infection has been known to have a negative impact on the outcome of HBV and HCV infections (16).

Previous Studies carried out evaluating the prevalence of HIV in pregnant women in Nigeria has focused on urban settings, with little or no studies done in rural areas (17,18). No study has been conducted in these communities on the HIV/ HBV, HIV/HCV and HIV/HCV/HBV co-infection. Also, Rural areas contain the bulk of ignorant individuals whom don not possess enough information and knowledge of this dreaded viral infections. This study reports findings from an assessment of the prevalence of HIV, HBV and HCV in antenatal patients in rural communities in Abaji area council, a rural community located in rural suburbs of Abuja, Nigeria.

MATERIAL and Method

Study area and subjects

Pregnant women attending the antenatal clinic of the General hospital, Abaji, were the subjects used for this study. General hospital Abaji is the government owned secondary healthcare facility serving the needs of patients in all communities in Abaji local area council, a rural settlement area located in the suburbs of federal capital territory, Abuja, Nigeria. The hospital runs a general obstetric clinic were pregnant women in the environs receive care. Abaji area council is made up of more than 30 villages whose inhabitants are predominantly farmers. Abaji is also the headquarters of the local council. This hospital is strategic because of its central location to other communities. Developmental program me in the federal capital has not reached its near peak, majority of original settlers reside in this rural community which is quite distant from the urban town of Abuja.

The subjects were recruited over a period of One year (1st April 2010- 30th March 2011). All pregnant women were counseled and informed consent was obtained to allow for blood taking and for HIV, HBV and HCV testing. A total of 395 pregnant women consented for the study and were enlisted. Women history was gathered to correlate a possible association with HIV status. Data on bio-data, history

of blood transfusion, tattooing, traditional scares, parity, traditional surgery history and educational status was obtained.

Collection and Processing of Samples

Blood samples were collected aseptically by veni-puncture from the donors and were analyzed for HIV-1 and HIV-2.

Screening for HIV

Determine® HIV-1/2 Test cards (manufactured by Inverness Medical, Japan), Unigold™ Kit (manufactured by Trinity Biotec, Ireland) and HIV -1/2 Stat- Pak® Assay (manufactured by Chembio Diagnostic Systems, USA) were used in a stepwise order for the detection of HIV-1 and HIV-2 in the blood. These methods which are immunochromatographic and qualitative in nature, detect the presence of antibodies to HIV-1 and HIV-2 in human blood and can be read in-vitro having more than 99.9% sensitivity and 99.75% specificity.

Screening for hepatitis B and C virus

After centrifugation, the sera were tested for HBsAg and anti-HCV using ELISA kit (Clinotech Diagnostics, Canada). Positive and negative control serum samples were run alongside test.

Data analysis

Data were analyzed using SPSS version 16.0 and an independent T-test method. Significance was determined at $P < 0.05$.

RESULTS

The antenatal clinic of the General hospital, Abaji received about 1430 pregnant women in the year of which 395 consented and participated in the study. Out of the 395 pregnant women studied 23 (5.8%) were sero-positive for HIV (Table 1). Primigravidity was significantly associated with HIV prevalence $p<0.001$ (Table 1). Table 2 summarizes the Age wise distribution of HIV, HBV and HCV in the pregnant women studied. All age groups showed seropositivity to HIV with the age group 22-26 recording the highest prevalence. Also, the age group 22-26 recorded the highest prevalence of HBV and HCV among the pregnant women studied. Lower age was found to be a more predisposing factor to the prevalence of HIV, HBV and HCV though, it was only statistically significant for HBV and HCV infection $p=0.01$.

Table 1: Prevalence of HIV in pregnant women in Abaji Area Council, Nigeria.

Parameter	No.	Percentage	Multigravidity	Primigravidity
Positive	23	5.8	8 (34.8)	15 (65.2)
Negative	372	94.2	117 (31.5)	255 (68.6)
	395	100	125 (31.7)	270 (68.4)

Table 2: Age wise prevalence of HIV among rural pregnant women.

Age (years)	No. tested	No. positive HIV	No. Positive HBV	No. positive HCV
<17	6	1 (4.4)	2 (4.4)	1 (8.3)
17-21	64	6 (26.1)	11 (24.4)	4 (33.3)
22-26	130	7 (30.4)	23 (51.1)	7 (58.3)
27-31	108	4 (17.4)	6 (13.3)	1
32-36	55	3 (13.0)	3 (6.7)	0
37-41	27	1 (4.3)	0	0
>41	5	1 (4.4)	0	0
Total	395	23(5.8)	45(11.4)	12 (3.0)

Table 3: Effect of risk factors on prevalence of HIV, HBV and HCV seropositivity.

	P value HIV	P value HBV	P value HCV

History of blood transfusion	0.3	0.5	0.4
Tattooing	0.3	0.1*	0.3
Less than secondary school	0.6	0.5	0.5
Traditional scares	0.8	0.3	0.3
Dental maneuvers	0.2	0.8	0.3
History of STI	<0.001*	0.3	0.5
Multiple sexual partners	0.1*	<0.001*	0.7
Unsterilized blades	0.5	0.2	0.5
Local alcohol use	0.5	0.3	0.7
Poor economic status	0.8	0.4	0.9

*Statistically significant

Table3 Shows the effect of potential risk factors to the prevalence of HIV in the pregnant women studied. Prior History of contacting a sexually transmitted disease was significantly associated with HIV seropositivity in the pregnant women p<0.001. With regard to level of education, literacy didn't play a role in seropositivity to HIV. Polygamous women had a higher prevalence of HIV and HBV (p=0.01, p<0.001). Tattooing was statistically associated with seropositivity for HBV in the studied pregnant women p=0.01.

None of the studied potential risk factors was associated with seropositivity for HCV in pregnant women studied in Abaji.

45 (11.4%) and 12 (3.0%) pregnant women studied were seropositive for Hepatitis B and C (Table 4).

Table 4: Sero-prevalence of Hepatitis B and C and its co-infection with HIV in Abaji pregnant women.

	Total screened	No. positive (%)	No. Negative (%)
Hepatitis B	395	45 (11.4)	350 (86.6)
Hepatitis C	395	12 (3.0)	398 (97.0)

DISCUSSION

The mortality and morbidity from these global infectious diseases (HIV, HBV and HCV) is well known (19).This study report a prevalence of 5.8%, 11.4% and 3.0% for HIV, HBsAg and HCV respectively in pregnant women in Abaji area council, a rural commune in the federal capital city, FCT Nigeria. This reports supports WHO's report for Nigeria, with prevalence of HIV, HBV and HCV greater than 5.0%, 8% and 1.2% respectively (20,21).

The prevalence for HIV recorded among pregnant women in Abaji, Nigeria was 5.8%. Higher prevalence of HIV have been recorded in other rural and sub-urban communities in parts of Nigeria, 14.7% was recorded in IQuita –Oron in Akwa Ibom and 10.0% in Saminka in Kaduna state (22). Our report is higher than that reported in Yenagoa, Nigeria (23). Our result is also higher than the 0.70% reported in a recent study involving rural pregnant women attending the PPTCT services at KLE Hospital, Belgaum, India (24). The low level prevalence recorded in India is coherent with findings from many reports carried out with pregnant rural Indian women with prevalence of 0.77%, 0.88% and 1.23% (25-27). The variability in prevalence report of this study and other studies conducted in rural communities in Nigeria and in other countries reflects the variations in the awareness of HIV infection, sexual practices, social-cultural practices and availability of healthcare.

Overall prevalence of HIV was higher in Primigravid women 15 (65.2%) when compared to multigravida women 8 (34.8%) (p<0.001).this finding concur with a study done by Buseri et al, were 6.0% and 3.1% prevalence of HIV was recorded between Primigravid and multigravida in Yenagoa (23). Studies done in other parts of the world have also reported a higher HIV prevalence in Primigravida when compared to multigravida (24-26). Buseri et al, has hypothesized that the higher prevalence found in Primigravid women might be due to early marriage which is associated with shorter period between premarital sexual debut and marriage associated with lower vulnerability (23). This study demonstrated a higher prevalence of HIV in the younger age when compared to the older pregnant women, though this was not statistically significant. The age group 22-26 had the highest seropositivity to HIV in this study. Several studies have also reported the preponderance

of a higher seropositivity in younger age. Sagay et al., in a study done in Jos, Nigeria using pregnant women reported that women aged 20-29 years had more than 4 fold increased risk of HIV, the prevalence of HIV increased from 2.2% among women below 20 years of age to 10.9% in subjects aged 25-29 years, and then reduced to 1.9% women aged 40 years and above (28). Imade et al ., in a study done using pregnant women attending the University hospital in Benin City, Nigeria observed that younger pregnant women were more likely infected with HIV than the older ones (17). In that study, the age groups 15-20 to 31-35 had a higher prevalence of HIV though it was not statistically significant. Buseri et al., in a recent study reported that HIV seropositivity was higher (19.2%) between the ages 15 and 34 years whilst none was found in the 40-44 years age group among pregnant women in Yenagoa (23). The higher sexual activities, increased biological vulnerability and prevalent unmanaged sexually transmitted diseases may explain for the higher prevalence of HIV in the younger age. Younger age has been proven to be an important factor in the prevalence of HIV in many studies, and the highlighted possible cause has been given to be a reason for the higher prevalence of HIV in the young age (29,30). In this area, it is evidenced that young women are married to older men and sometimes young women have sexual relationships with men that are older. Reports from other studies in Nigeria, has hypothesized that this relatively older men has been exposed to possible risk factors of HIV for many years (28,31).

Low level of education didn't play a role in the seropositivity of the studied pregnant women to HIV. This report agrees with other studies done in Nigeria (17,23). It is common to find illiterate women adhering to traditional customs and practices that forbid them from engaging in extramarital sexual practices. Polygamy was found to be a significant predisposing factor in HIV seropositivity. Polygamy in this study refers to women with unidentifiable husband. The world health organization has reported that multiple sexual relationships have been found to contribute a significant role in the growing HIV spread in Sub-saharan Africa (9). History of blood transfusion, tattooing, Use of unsterilized objects, economic status did not play a significant role in HIV seropositivity in the studied pregnant women. Blood use in this hospital is usually regulated, only at extreme medical cases are they used. Also, strict guidelines to blood safety are also employed in the laboratory. History of sexually transmitted disease (STI) was significantly associated with HIV seropositivity $p<0.001$. Other studies have also found a significant association between history of untreated STDS and HIV seropositivity (17,28). STI such as syphilis, Bacterial vaginosis, Candidiasis, Trichomoniasis and genital ulcers have been known to potentiate the acquisition of HIV by providing a portal of entry for HIV, increasing the presence of HIV susceptible cells, weakening and disturbing of the vaginal flora which could weaken the vaginal integrity and increase HIV risk and also increase in vaginal inflammatory cells (cytokines and interleukin -10) (32,33).

In this study, 11.4% of the pregnant women in Abaji local government area were HBsAg seropositive. The prevalence of HBV in this study is higher than 4.7%, 8.3% and 7.3% recorded among antenatal patients in Akure, Nnewi and Kano all in Nigeria (34-36). In contrast it was less than the 12.5% recorded at the University of Benin teaching hospital and 18.3% in Zaria (37,38). Lesser prevalence has been reported in other parts of the world. In a retrospective study carried out using antenatal records in a European collaborative study, of 1050 women studied, 4.9% were HBsAg positive (39).

In this study, HBsAg seropositivity was significantly higher in pregnant women who consented to haven had more than one sexual partner ($p< 0.001$) and tattooing ($p=0.01$). HBV is mainly transmitted from person to person the most common routes of infection includes blood transfusions and blood products where there is no screening for blood-borne viruses, medical or dental interventions in countries where equipment is not adequately sterilized mother to infant during childbirth, sexual transmission (in the case of hepatitis B), sharing equipment for injecting drugs, sharing straws, notes etc. for snorting cocaine (cocaine is particularly alkaline and corrosive), sharing razors, toothbrushes or other household articles, tattooing and body piercing if done using unsterile equipment (40).

3.0% were seropositive for anti-HCV antibodies. This finding confirms a high prevalence of HCV in pregnant women in this locality. This value is much higher than the 0.5% recorded by Buseri et al, among pregnant women in Yenagoa, Bayelsa state, Nigeria and 1.5% HCV seropositivity in pregnant women attending the University of Abuja teaching hospital, Gwagwalada, Nigeria (23,41). The 3.0% obtained in this study was also lower than 3.6% recorded in a recent study conducted by Ugbebor et al, among pregnant women attending the antenatal clinic of the University of Benin teaching hospital. 5% and 14.9% have been recorded in faith me diplex hospital in Benin City and in Enugu, Nigeria (37,42,43). Higher prevalence for HCV have been recorded in other parts

of the world .In a study carried out in some local communities in India; HCV prevalence was 3.44% and 1.52% out of 3020 pregnant women studied using serological technique and HCV-RNA PCR respectively. 12.3% in a multicenter study of pregnant women in Europe and 5% was recorded in Tanzania (39,44). Varying seropositivity indices have been reported in these various studies, this reflects the variation in the epidemiological pattern in the prevalence of HCV worldwide. The method of assay for HCV in these various studies differ, this may also account for the variation in the prevalence reports. It is to be noted that HCV prevalence is increasing taken into consideration prevalence reports in studies from a preceding year to a new year.

None of the expected risk factors for HCV was identified in this study. This is in agreement with previous studies (45,46). The spread of this infection has to be tamed as viral hepatitis during pregnancy is associated with high maternal complications. There is a high rate of vertical transmission causing fetal and neonatal hepatitis which can have serious effects on the neonate, leading to impaired mental and physical health later in life. A leading cause in maternal mortality is also said to be the most familiar cause of jaundice in pregnancy (47,48).

In conclusion, 5.8%, 11.4% and 3.0% of the pregnant women studied in rural communities of Abaji local area council were seropositive for antibodies to HIV, HBV and anti-HCV. The study confirms the endemicity of these infections in the rural communities studied. As such, screening for these infections must continue, standard and regular screening of pregnant women in these rural communities must be taken as a custom for the time been.

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Conflicts of interest

The authors declare no conflicts of interest.

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