

**SYPHILIS AND HUMAN IMMUNODEFICIENCY VIRUS CO-INFECTION AMONG
PREGNANT WOMEN IN NIGERIA: PREVALENCE AND TREND**

ABSTRACT- Pregnant women are at increased risk of sexually transmitted infections (STIs) due to physiological changes that accompany pregnancy, such as congestion of the cervix, edema of the vaginal mucosa, and alterations in the vaginal flora. Syphilis and HIV are both transmitted sexually and so it is not surprise that a substantial number of people are infected with both agents. The rate of HIV and syphilis co-infection varies depending on the prevalence of both infections in the community or the patient group being studied, along with individual risk factors. 1913 apparently healthy pregnant women were recruited for the study after obtained their consent. Detection of HIV p24 antigen and antibodies to HIV1/2 was screened for using BIO-RAD in-vitro diagnostic enzyme immunoassay; syphilis was screen for using DIA-PRO in-vitro diagnostic Bio-probes enzyme immunoassay for the determination of antibodies to *Treponema palladium*. Age group 26-30 had highest prevalence of HIV and VDRL in the study years, a decreasing trend was observed in the prevalence of HIV and syphilis infection within the study years. Sero-prevalence of HIV and VDRL were 63(3.29%) and 03(0.16%) respectively. The prevalence of HIV and VDRL co-infection was 01(0.05%) observed in age group 26-30. This present study clearly documents a relatively declined in sero-prevalence of HIV and VDRL

within the consecutive three years of study, this reflects the level of HIV and VDRL in the general population.

Key words: Syphilis, Human Immunodeficiency Virus, Mode of Transmission

INTRODUCTION

Pregnant women are at increased risk of STIs due to physiological changes that accompany pregnancy, such as congestion of the cervix, edema of the vaginal mucosa, and alterations in the

39 vaginal flora ⁽²⁷⁾. Additionally, pregnant women may be less likely to have partners that use
40 condoms, and may have fewer options to leave unsafe relationships ⁽²³⁾. Syphilis and HIV are
41 both transmitted sexually and so it is no surprise that a substantial number of people are infected
42 with both agents. Syphilis is a systemic infectious disease caused by sexual or congenital
43 transmission of the spirochete bacterium *Treponema pallidum* (*T. pallidum*). Syphilis causes a
44 variety of signs and symptoms corresponding to stages of infection (primary, secondary, latent
45 and tertiary). The primary stage classically presents with a single chancre (a firm, painless, non-
46 itchy skin ulceration), secondary syphilis with a diffuse rash which frequently involves the palms
47 of the hands and soles of the feet, latent syphilis with little to no symptoms, and tertiary syphilis
48 includes gummatous, cardiovascular, and neurological complications that can lead to significant
49 disability and premature death. Congenital syphilis results in fetal or perinatal death, as well as
50 disease complications in surviving newborns ^(10, 15, 19). Syphilis is believed to have infected 12
51 million people in the year 1999, with greater than 90% of cases in the developing world. It
52 affects between 700,000 and 1.6 million pregnancies a year, resulting in spontaneous abortions,
53 stillbirths, and congenital syphilis ^[32]. Rates are proportionally higher among intravenous drug
54 users, those who are infected with HIV and men who have sex with men ^(10, 15, 19). In the United
55 States, rates of syphilis as of 2007 were six times greater in men than women, while they were
56 nearly equal in year 1997 ^[7]. African Americans accounted for almost half of all cases in year
57 2010 ^[8]. Syphilis infections declined rapidly with the widespread use of antibiotics, syphilis is
58 associated with HIV infection which increases the risk of HIV transmission by two to five times
59 and acquisition by causing genital ulcers. Genital ulcer disease is linked to increased risk of HIV
60 infection and is most commonly due to herpes simplex virus (HSV) in both HIV positive and
61 negative patients ⁽²⁾. The rate of HIV and syphilis co-infection varies depending on the

prevalence of both infections in the community or the patient group being studied, along with individual risk factors. Co-infection is common (30–60% in a number of urban centres) ^[20]. Sexually transmitted infections (STIs) are a major global cause of infertility, long-term disability and death with severe medical and psychological consequences for millions of men, women and infants ⁽³³⁾. The genital ulcerations and inflammation caused by syphilis are implicated as cofactor making infected individuals three to five times more likely to acquire HIV if exposed to the virus through sexual contact. Unless prompt diagnosis and treatment of syphilis are carried out, serious complications including male and female infertility may result, and in pregnancy, adverse outcomes such as still-birth, congenital abnormalities, prenatal death and serious neonatal infection ⁽²⁶⁾. Syphilis, a reportable disease caused by *Treponema pallidum*, is tracked by the Centers for Disease Control and Prevention (CDC). That is, it can be transmitted either by intimate contact with infectious lesions (most common) or via blood transfusion (if blood has been collected during early syphilis), and it can also be transmitted transplacentally from an infected mother to her fetus^(9, 14).

MATERIALS AND METHODS

STUDY AREA

The study site was Ido town, the headquarters of ido-osi local government in Ekiti State, Nigeria. The secretariat sited in between Ido town and Usi town. It is very close to other local government districts, (Moba, Ijero, Ilejemeje and Ado). The local government comprises rural towns: Aaye, Ido, Usi, Ayetoro, Ilogbo, Osi, Ifaki, Orin, Ora, Igbole and some other smaller villages, inhabited

mainly by the Ekitis, but with some non-Ekitis fund living peacefully among the people. According to 1991 Census, the Local government has a total population of 107,000 people with eleven electoral wards in the Local government.

SAMPLES COLLECTION AND LABORATORY METHODS

One thousand nine hundred and thirteen (1913) apparently healthy pregnant women who attended the antenatal clinic at the Federal Medical Centre Ido-Ekiti, Ekiti State, Nigeria between January 2011 and December 2013 were recruited for the study after obtained their consent. An ethical clearance for this study was obtained from ethical and research committee. 4ml of venous blood was collected by venepuncture into a plain bottle and allowed to clot. Detection of HIV p24 antigen and antibodies to HIV-1 and HIV-2 was screened for using BIO-RAD in-vitro diagnostic enzyme immunoassay (ELISA-method). The procedure was described by the manufacturer of the kit; syphilis was screen for using DIA-PRO in-vitro diagnostic Bio-probes enzyme immunoassay (ELISA-method) for the determination of antibodies to *Treponema palladium*. The procedure was as described by the manufacturer of the kit.

RESULTS

A total of 1913 apparently healthy pregnant women were recruited for the study from Federal Medical Centre, Ido-Ekiti. HIV and syphilis infections (VDRL) were screened for during the period of three consecutive years between 2011 and 2013; age group 26-30 had highest

prevalence of HIV and VDRL in the study years. Sero-prevalence of HIV and VDRL were 63 (3.29%) and 03 (0.16%) respectively as showed in tables 1-2. The prevalence of HIV and VDRL co-infection was 01 (0.05%) observed in age group 26-30 as showed in table 3.

Table 1 Prevalence of HIV among study population

Age group	Positivity	Negativity
15-20	-	52(2.72%)
21-25	15(0.78%)	568(29.69%)
26-30	38(1.99%)	612(31.99%)
31-35	08(0.42%)	411(21.48%)
36-40	02(0.10%)	195(10.19%)
41- above	-	12(0.63%)
Total	63(3.29%)	1850(96.71%)

Table 2: Prevalence of VDRL among study population

Age group	VDRL Positivity	VDRL Negativity
15-20	-	52(2.72%)
21-25	01(0.05%)	582(30.42%)
26-30	02(0.10%)	648(33.87%)
31-35	-	419(21.90%)
36-40	-	197(10.30%)
41- above	-	12 (0.63%)
Total	03(0.16%)	1910(99.84%)

Table 3: Sero prevalence and co-infection of HIV and VDRL among study population

Age group	HIV positivity	VDRL positivity	Co-infection of HIV and VDRL
15-20	-	-	-
21-25	15(0.78%)	01(0.05%)	-
26-30	38(1.99%)	02(0.10%)	01(0.05%)
31-35	08(0.42%)	-	-
36-40	02(0.10%)	-	-
41- above	-	-	-
Total	63(3.29%)	03(0.15%)	1(0.05%)

DISCUSSION

Sexually transmitted infections are widely spread in developing countries and constitute a major public health problem. Syphilis has also acquired a new potential for morbidity and mortality through association with increased risk of HIV infection. The sero-prevalence of HIV1/2 and VDRL in the study population was 63 (3.29%) and 03 (0.16%) respectively which suggests that HIV affect a large percentage of clinic patients. 1 (0.05%) co-infection for HIV-syphilis was reported in age group 26-30 years. Less than 4.1% prevalence rates for HIV was reported for Oyo State in the last national sentinel survey which is similar to the prevalence rate for HIV infection in this present study. Nigeria's epidemic is characterized as one of the most rapidly increasing rates of HIV and AIDS. The prevalence rate of 3.29% recorded for HIV in this study is in line with that of the Federal Ministry of Health (2005) Sentinel Study on HIV in Nigeria. Contrary to this present study, Okonko *et al.*, 2012 reported that out of 400 subjects under study, Syphilis and HIV Status were 35 (8.8%) for HIV positive and 3(0.8%) were reactive for syphilis. Hussain *et al.*, 2006 reported that out of 863 subjects, 1 (0.1%) co-infection for HIV-syphilis, 21 (2.4%) was serologically reactive for HIV-1/2 and 47 (5.4%) was reactive for syphilis which is contrary to what observed in this present study. The VDRL reactivity in this present study was very low compared to 2.6% noted by Singh *et al.*, 2005 and 1.6% by Srikrishna *et al.*, 1999 but relatively similar to Arora *et al.*, 2010 and Bhattacharya *et al.*, 2007 reported a 0.9% and 0.72% of VDRL reactivity respectively. The results of serological screening tests for HIV and syphilis infections performed by Hossein *et al.*, 2009 in Tehran blood transfusion service between year 2003 and 2005 showed that the sero-prevalence was 2509 (0.2%) for HIV Ab1/2, and 402 (0.04%) for VDRL in 1004889 subjects; contrary to this present study, he reported the trend of

217 HIV infection frequency had no increasing or decreasing pattern and was relatively stable and
218 the trend of syphilis infection frequency was increasing in year 2003 to 2005. However, similar
219 to this present study, Salawu *et al.*, 2010 reported a gradual decline in the prevalence rate of anti-
220 HIV which declined from 1.44% in 2006 to 0.94% in 2007 and to reach its lowest level of 0.66%
221 in 2008 but rose to 0.96% in the first half of 2009. VDRL showed a downward trend from
222 2.93% in 2008 to 1.92% in the first half of 2009, but contrary to this present study, 7.4% co-
223 infection with HIV and syphilis was reported. In sub-Saharan Africa between 2 and 17% of
224 women test positive for syphilis in antenatal clinics and rates of HIV co-infection are very high,
225 contrary to this present study. In North America and Western Europe the incidence of syphilis is
226 much lower at less than 5/100 000 of the population or less ⁽²¹⁾. There was steady decline in the
227 incidence of syphilis in both Europe and the USA during the second half of the last century ^{(16,}
228 ²¹⁾, this is similar to this present study leading to the suggestions that endemic syphilis might
229 even be eradicated in the study area. Age group 26-30 had highest prevalence of 38(1.99%) and
230 02(0.10%) in HIV and VDRL infection respectively in the study years, this is similar to Esan *et al*
231 2014, who reported that age group 26-30 and 31-35 had highest prevalence of HBV and HCV
232 among pregnant women, it was then concluded that these were the majority age groups that
233 attending antenatal clinic of the hospital. Contrary to this study, Okonko *et al.*, 2012 reported
234 that 2(0.6%) subjects in the 16—39 years age group and 1(1.7%) in the 40 years and above age
235 group were VDRL positive. The difference in syphilis positive status was reported significant
236 between ages of subjects. 28(8.2%) subjects in the 16—39 years age group and 7 (11.7%) in the
237 40 years and above age group were HIV positive, but the difference in HIV positive status was
238 not significant between ages of subjects.

CONCLUSION

This present study clearly documents a relatively declined in sero-prevalence of HIV and VDRL within the consecutive three years of study, this reflects the level of HIV and VDRL in the general population, this is due to the fact of the community based outreach embarked upon by the health professionals in the area with a focus of getting to zero level in the region.

RECOMMEDATION

All pregnant women should be screened for HIV and syphilis at their first antenatal visit within the first trimester and again in the third trimester. Pregnant women presenting with syphilis should be offered HIV testing and all HIV-positive pregnant women should be regularly screened for syphilis.

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