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Prevalence of syphilis seropositivity in antenatal clinic clients in a teaching hospital in South–South region of Nigeria

Onwuezobe IA^{1*}, Ochang EA¹, Umoyioho A², Bassey EA², Umoffia EM¹¹Department of Medical Microbiology and Parasitology, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria²Department of Obstetrics and Gynaecology, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria

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ABSTRACT

Objective: To assess the seroprevalence of syphilis among women receiving antenatal care in University of Uyo Teaching Hospital (UUTH), Uyo, Akwa Ibom State, Nigeria. **Methods:** Between July 2009 to March 2010, blood samples of 415 consenting clients submitted for prevention of mother to child transmission (PMTCT) HIV screening programme were screened for syphilis antibodies using the Immunochromatographic ACON Ultra Rapid Syphilis Test Strip (ACON laboratory Inc. USA). Any positive result was repeated with another test strip (Diaspot Ultra Rapid Syphilis Test Strip, Diaspot Inc. USA). **Results:** Of the 415 samples, 9 (2.2%) were syphilis seropositive and 14 (3.4%) were HIV positive. Assessment of risk factors for syphilis revealed an observed trend with increasing parity though statistically not significant ($P=0.268$). More than half of the syphilis positive clients believed their spouses were promiscuous. **Conclusions:** There is still a substantial carriage of syphilis among antenatal clinic attendees in UUTH, Uyo. The need for routine screening is imperative. Point of care testing should conveniently be incorporated into the PMTCT programme.

1. Introduction

Syphilis, a chronic systemic infection caused by *Treponema pallidum* subspecies *pallidum*, is predominantly sexually transmitted with untreated cases in pregnancy resulting in transplacental transmission.

Adverse obstetric outcome has been observed to be higher in syphilis positive than negative mothers with complications of late abortion, still birth and neonatal death occurring commonly depending on the severity of infection[1,2]. A global study showed that maternal syphilis was responsible for 460 000 abortions and stillbirths, 270000 cases of congenital syphilis and low birth weight and premature babies annually and it is more serious in developing countries[3,4].

In light of the substantial burden of the disease, the World Health Organization had recommended that all pregnant women should be screened at their first antenatal visit and the test repeated early in third trimester[5]. In sub-Saharan Africa with syphilis prevalence ranging from 0.3% to 8.0% among pregnant women, antenatal screening is still poor[1,2,6,7].

Screening in pregnancy enables treatment of mother, fetus and sexual partners. Syphilis testing and prompt treatment with single dose of 2.4 million units of benzathine penicillin have been shown to prevent adverse obstetric outcome related to syphilis[8,9].

In view of these attendant problems and the benefits of early intervention following early diagnosis, pregnant women attending antenatal clinic in University of Uyo Teaching Hospital (UUTH), Uyo, Akwa Ibom State, Nigeria, not routinely screened for syphilis were screened to determine the prevalence of syphilis seropositivity among them.

2. Materials and methods

2.1. Ethical clearance

Ethical clearance was obtained from the University of Uyo Teaching Hospital ethical committee.

2.2. Study population

All pregnant women on their booking or first visit to the antenatal clinic of UUTH, Uyo, Akwa Ibom State, Nigeria within the study period were invited to participate in the

*Corresponding author: Dr. Ifeanyi A Onwuezobe, Department of Medical Microbiology and Parasitology, University of Uyo teaching Hospital, PMB 1136, Uyo, Akwa Ibom State, Nigeria.

Tex: +234-8033032191

E-mail: ifezobe@yahoo.com

study. With the seroprevalence of 8%^[2], the minimum sample size of 404 was obtained using the statistical formula^[10]; $N=Z^2 \times p \times q/d^2$; where N=minimum sample size; Z=area under normal curve of 2SD=1.96; p=prevalence; q=100%–p; d=tolerable error=7%.

2.3. Sampling method

Informed consent was obtained at the point of blood collection. Questionnaire was also used to obtain biodata and to assess risk of syphilis and other STIs. The questionnaires were self administered except those who were not lettered then interpretation was done by the laboratory assistant. Blood samples from consenting clients submitted for HIV testing for prevention of maternal to child transmission (PMTCT), which is done for all women attending antenatal clinic in UUTH, were used, obviating the need for another venepuncture.

2.4. Test procedure

Inside the laboratory, serum was separated and tested for syphilis. Where delays were anticipated, serum samples were stored at –20 °C for up to 48 hours. Samples were screened for syphilis seropositivity using the Acon Ultra Rapid Syphilis test strips (ACON Laboratory Inc. U.S.A.), according to manufacturer’s instructions. This is an immunochromatographic (ICT) based specific treponemal test with a sensitivity of 98.6%–100.0% and specificity of 98.6%–100.0%. Positive sera were again tested with a second rapid test strip (Diaspot Ultra Rapid Syphilis test strip, Diaspot Inc. USA). Non treponemal test could not be done to differentiate active cases from previously treated cases due to unreliability of available Rapid Plasma Reagin (RPR) and Venereal Disease Research Laboratory (VDRL) test kits because of poor preservation occasioned by incessant power outages. The HIV result of the clients were extracted from the HIV register of the UUTH Institute of Human Virology Nigeria(IHVN) supported HIV laboratory.

2.5. Follow up

Results of all syphilis seropositive clients were sent to the case notes for treatment by their obstetrician.

2.6. Data analysis

All data were analyzed using the SPPSS version 17 statistical software. Pearson χ^2 test was used to assess relative risk at 95% confidence interval and $P \geq 0.05$ considered significant.

3. Results

The study was carried out between July 2009 to March 2010 and 415 pregnant women consented to the study. The modal age range of the consenting women was 25–29 which accounted for 171 (41.2%) of the study population and 17 (4.1%) were less than 20 years of age, with 98 (23.6%) between

20–24 years–old, 95 (22.9%) between the age of 30–34, 33 (8.0%) between 35–39 years–old and 1 (0.2%) more than 40 years old. Among the 415 participants, 217 (52.3%) have tertiary education, 140 (33.7%) attended senior secondary school, 27 (6.5%) attended junior secondary school, 18 (4.3%) attended primary school and 13 (3.1%) were post graduate. Two hundred and thirty (55.4%) had post secondary education with the predominant occupation of the clients being trading and civil servants which accounted for 95 (22.9%) and 66 (15.9%), respectively (Figure 1). Eighty two (19.8%) of the clients were primigravid while 84 (20.2%) and 33 (8.0%) had previous histories of at least 1 previous missed abortions (miscarriage) and stillbirths, respectively (Table 1 and Table 2).

Table 1
Relationship between syphilis seropositivity and parity among ANC attendees in UUTH [n (%)].

Syphilis status	Parity				
Positive	0 (0.0)	2 (1.7)	2 (2.0)	2 (3.2)	3 (5.6)
Negative	82 (100.0)	115 (98.3)	98 (98.0)	60 (96.8)	51 (94.4)

$\chi^2=5.194$; $df=4$; $P=0.268$.

Table 2
Relationship between syphilis seropositivity and missed abortion (miscarriage) among ANC clients in UUTH [n (%)].

Syphilis status	Missed abortions			
Positive	5 (1.5)	4 (5.9)	0 (0.0)	0 (0.0)
Negative	326 (98.5)	64 (94.1)	11 (100.0)	5 (100.0)

$\chi^2=5.451$; $df=3$; $P=0.142$.

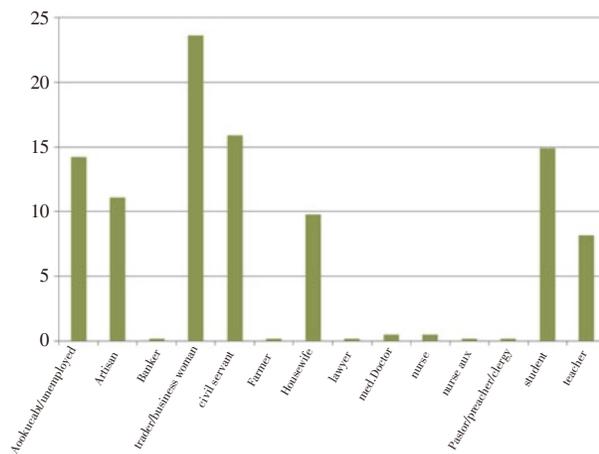


Figure 1. Occupation of ANC clients in UUTH.

A total of 9 (2.2%) of the clients were syphilis seropositive and 19 (3.4%) were HIV positive while none was coinfecting with both syphilis and HIV. There was conformity between both rapid syphilis test kits except for one sample which was positive with the Acon kit and negative with the Diaspot kit. There was a trend for syphilis seropositivity with increasing parity, though, it was statistically non significant ($\chi^2=5.194$; $df=4$; $P=0.268$). There was also no difference in syphilis seropositivity between those with and without previous histories of missed abortions ($\chi^2=5.451$; $df=3$; $P=0.142$) and non had a previous stillbirth. None of the syphilis positive

clients admitted either having or their spouses having a previous genital ulcer. They also did not admit to having more than one current sexual partner however, 5 (55.6%) admitted that their spouses were promiscuous.

4. Discussion

There is still a substantial burden of syphilis in both developed and developing nations and many pregnant women still miss the opportunity of early detection. In UUTH, Uyo Nigeria, routine screening is not done for all ANC attendees. The seroprevalence of 2.2% among ANC attendees observed in this study is higher than the 2001 South–South Nigeria regional sentinel survey value of 1.5% and that reported for Enugu, Nigeria of 0.3%^[4], but close to 2.9% reported for Osogbo, South West Nigeria^[11].

The HIV prevalence of 3.4% seen in this study is lower than the 9.7% recorded in Akwa Ibom State in the 2008 HIV sentinel survey^[12]. This may be due to the smaller sample size in this study or the fact that the sentinel survey was a multicenter study with HIV patients probably disproportionately distributed across the state. It may also reflect a decline in new infections owing to massive awareness campaigns.

A limitation to this study may be the use of rapid ICT test strips which are specific treponemal tests hence some of the positive cases may be previously treated infections and not active infections. False positive rates are however low with ICT kits as WHO studies reported sensitivities of 85%–98% and specificities of 93%–98% compared with TPHA and TPPA as reference standards^[13,14]. Though the ICT test have the advantages of low cost, user friendliness and provide same day results, the disagreement in one sample calls for local evaluation of available kits as there are gaining prominence in Nigerian laboratories.

Risk factors for syphilis could not be clearly established from this study. There is however an increasing trend with parity though statistically not significant which also had been observed in a study done elsewhere^[15]. Another study had found an older age and history of still birth as risk factors for prevalence and younger age as risk factors for incidence^[5].

The modal age group of our patients was 25 to 29 years of age reflecting largely the sexually active age group with risk of STIs. Most of our clients did not admitting to having multiple sexual partners may be due to cultural and societal norms which made it difficult for women to admit to extramarital affairs. The finding in this study, that more than half of the syphilis seropositive clients believed their spouses had high risk sexual behavior, is similar to another study which was also extrapolated that the women had twice the risk of HIV than prostitutes^[15].

In conclusion, the need for syphilis screening in ANC is still imperative and has also been reaffirmed elsewhere^[11,16]. The points of care test have been shown to satisfy the WHO 'ASSURED' criteria^[13] and so could be used for rapid screening and positive samples re–tested with a non treponemal test such as VDRL and RPR to identify active infections as recommended by WHO^[14].

Conflict of interest statement

We declare that we have no conflict of interest.

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