



Prevalence of Syphilis among Pregnant Women in Two Health Care Facilities in South Western Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author OAO conceived the study. Authors OAO and OBM designed the study wrote the protocol. Authors RAO and JOO managed the literature search. Author OAO managed the acquisition of data. Authors OBM and OO performed the analysis and interpretation of data. Authors OAO and OBM wrote the first draft of the manuscript. Authors OAO, OBM, OO, SOF made critical revisions to the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The prevalence of syphilis has been reported to be on the increase worldwide as a result of the HIV/AIDS pandemic. Maternal syphilis puts the fetus at risk of congenital syphilis with the attendant health risks including intrauterine death. This study was carried out to determine the seroprevalence among pregnant women attending antenatal care unit of two tertiary care facilities in South Western Nigeria.

Study Design: A Cross-sectional study was carried out.

Place and Duration of Study: LAUTECH Teaching Hospital, Osogbo and State Specialist Hospital, Osogbo, Nigeria from October 2012 to May 2013.

Methodology: Three hundred and ninety-four pregnant women were recruited for this cross-sectional descriptive study carried out from October 2012 to May 2013. A semi-structured questionnaire for socio-demographic information was administered and venous blood samples collected after obtaining informed consent and giving a health talk on mother-to-child transmission of Human Immunodeficiency Virus. Screening for syphilis was done using the qualitative Rapid Plasma Reagin (RPR) test. All reactive sera then had their RPR titre quantified. The confirmatory test for reactive sera was carried out using the *Treponema pallidum* haemagglutination (TPHA) test.

Results: Eight (2%) of the 394 samples were reactive for RPR; while 4(1.0%) were positive for TPHA, giving a 1.0% seroprevalence rate. Out of all the women positive for RPR, most (75%) were without any formal education while the remaining 2 had only primary education. All 4 samples that were confirmed positive by TPHA were from women with no formal education. Of the 8 positive sample for RPR titre values ranged from 1:2 to 1:8 with higher titres found in those that were TPHA positive.

Conclusion: Even though the study recorded low prevalence rate of syphilis in both facilities, it is important to note that the cases were asymptomatic. Therefore routine screening for syphilis in antenatal clinic should be encouraged to prevent mother to child transmission of syphilis.

Keywords: Seroprevalence; syphilis; pregnancy; Nigeria.

1. INTRODUCTION

Syphilis is a muco-cutaneous sexually transmitted infection caused by the spirochaete, *Treponema pallidum* subspecies *pallidum*. Although the primary route of transmission is through sexual contact, it may also be transmitted from mother to fetus during pregnancy or at birth, resulting in congenital syphilis [1]. After decreasing dramatically since the widespread availability of penicillin in the 1940s, the rates of infection have increased since the turn of the millennium in many countries, often in combination with Human Immunodeficiency Virus (HIV) infection [2]. This rise has been attributed partly to unsafe sexual practices among men who have sex with men (MSM), increased rate of promiscuity, prostitution, and less interest in the usage of condom [3,4].

Syphilis is believed to have infected over 12 million people in 1999, with greater than 90% of cases in seen in the under developed countries [5]. It affects between 700,000 and 1.9 million pregnancies a year, the 2008 estimate from the WHO revealed that 1.9 million pregnant women had active syphilis and the incidence of syphilis in pregnancy is higher in women who did not receive adequate prenatal care [5]. Rates are also higher in the sub-Saharan Africa, where syphilis is found more among drug users and those infected with HIV [3,4]. The implication of syphilis infection in pregnancy is the severe impact on pregnancy outcome. Maternal syphilis is associated with many adverse outcomes like spontaneous abortion, premature delivery, low birth weight, 26% still births, 29% prenatal deaths, 11% neonatal deaths and globally [6]. In 1993 World Development Report (WDR) noted that antenatal syphilis screening was one of the most cost effective ways to improve children's health [6,7].

Syphilis can present in at least one to four stages: primary, secondary, latent, and tertiary [8,9]. Congenital syphilis (CS) can be classified into early and late CS and the manifestations are influenced by factors such as gestational age, stage of maternal syphilis, maternal treatment, and immunological response of the fetus [10].

Hepatomegaly, splenomegaly, hemolytic anemia, osteochondritis, nephrotic syndrome and hydrops fetalis are seen in early CS while late CS is characterized by Hutchinson's triad, which is a constellation of Hutchinson's teeth, interstitial keratitis and eighth nerve deafness [10]. In Nigeria, there are no National policies on antenatal screening of syphilis and no consensus among obstetricians in Nigeria [11]. Different hospitals decide on their own different approach to screening procedures. Some hospitals screen all pregnant women, some screen only those in whom it is indicated and others do not screen at all. There is also no uniform screening test across all centres. However there is need for hospitals to carry out routine antenatal screening [12]. Testing for syphilis in pregnancy and labor is medically indicated because of the potential risk for congenital infection and fetal loss [13]. Syphilis has also acquired a new potential for morbidity and mortality through its association with increased risk for HIV infection [14]. There is sparse information on the disease from the South Western region.

The aim of this Cross-sectional study was to determine the prevalence of syphilis among pregnant women in Nigerian Hospitals in order to reinforce the need for routine screening of syphilis and other reproductive tract infections in this environment.

2. MATERIALS AND METHODS

2.1 Ethical Approval

Ethical approval for the study was obtained from the Ethics/Research Committees of both Ladoke Akintola University Teaching Hospital and the State Specialist Hospital, Osogbo.

2.2 Time Frame

A descriptive cross sectional study was carried out in an eight month period from October 2, 2012 to May 31, 2013.

2.3 Study Population

We investigated a total of 394 consecutive registered pregnant women attending the antenatal clinics of two tertiary care facilities in Osun State, South Western Nigeria, namely; Ladoke Akintola University Teaching Hospital and the State Specialist Hospital, Osogbo. These health care facilities serve majority of women in this area. Total sampling was done as all women who were presenting for the first time in the index pregnancy, during the time frame of the study were recruited. All the women consented to participate.

2.4 Sample Method

Informed consent was sought from each participant before recruiting them for the study. They were given a health talk on Mother-to-Child transmission of Human Immunodeficiency Virus. A semi-structured questionnaire was then administered for collection of demographic

and clinical information including age, address, occupation, level of education, gestational age and parity.

The questionnaire was either interviewer administered or self administered depending on the level of literacy of the participant. From each patient, 5ml of venous blood was collected from the antecubital vein into sterile tubes.

2.5 Sample Procedure

Serum was obtained following centrifugation and stored at -20°C until tested. All serum samples, test antigens and control samples were brought to room temperature (26°C) and tested by the qualitative rapid plasma reagin (RPR) test using a RPR-Slide TM test kit (Cal-Tech Diagnostics Inc., Chino, California, USA). All reactive sera were then subjected to the quantitative estimation of their titres. The *Treponema pallidum* haemagglutination (TPHA) test (Randox Laboratories Ltd, United Kingdom) was used as a confirmatory test for all positive RPR sera. All investigations were carried out according to manufacturers' instructions.

2.6 Sample Analysis

The data obtained was analyzed using the statistical package for social sciences (SPSS, version 18) statistical software.

3. RESULTS

A total of 394 pregnant women participated in the study, 181 from LAUTECH Teaching Hospital and 213 from State Specialist Hospital. The age range of participants was 18- 45 years with a mean of 32.0 ± 1.87 years. Most of the women were in their second trimester (Table 1).

Table 1. Syphilis infection in pregnant women of various age group

	Lautech teaching hospital	State specialist hosp	Total
No of women	181	213	394
Age range (Years)	18-45	20-44	18-45
Mean age (Years)	31.5 ± 2.3	32.5 ± 1.5	32.0 ± 1.87
Trimester			
1 st Trimester	70	88	158
2 nd Trimester	105	117	222
3 rd Trimester	6	8	14
Total	181	213	394

Of the 394 samples, 8 (2.0%) were positive for RPR; while the others were nonreactive. Four of the 8 reactive RPR samples were positive for TPHA, giving a 1.0% seroprevalence rate (Table 2).

Table 2. Characteristics of positive samples to RPR and TPHA tests among pregnant women in two tertiary care facilities

S/N	RPR titre	TPHA	Age	Trimester	Education	Hospital
1	1:8	+	27	2 nd	Nil	LAUTECH teaching hospital
2	1:2	-	32	2 nd	Primary	LAUTECH teaching hospital
3	1:4	-	30	3 rd	Nil	LAUTECH teaching hospital
4	1:4	-	37	2 nd	Primary	State specialist hospital
5	1:8	+	28	2 nd	Nil	State specialist hospital
6	1:8	+	30	2 nd	Nil	State specialist hospital
7	1:8	+	35	2 nd	Nil	State specialist hospital
8	1:4	-	32	2 nd	Nil	State specialist hospital

Out of the 8 women positive for RPR, 2 (25%) had only primary education, while the remaining 6 (75%) were without any formal educational. The titre values of reactive samples on RPR ranged from 1:2 to 1:8 with all the 4 positive samples that were confirmed as syphilis on TPHA having titres of 1:8.

4. DISCUSSION

Sexually Transmitted Infections including syphilis are common in pregnancy in Nigeria [15]. Several studies have demonstrated that pregnant women may have syphilis [13,16,17]. The seroprevalence of syphilis reported in this study was 1.0% which is quite low compared to previous work conducted at the same centre in 2007 which reported a seroprevalence of approximately 3.0% in 505 pregnant women investigated as compared to our own present study of 394 cases [12]. This might indicate a decline in the prevalence of syphilis these health care facilities although this was not statistically proven. In other parts of Africa, studies report prevalence of between 4 and 19%, for example, researchers in Mozambique reported a seroprevalence of 18.3% in antenatal care attendees, and a much lower rate of 5% seroprevalence was reported in pregnant women in Malawi [17-19]. In India, seroprevalence of syphilis was reported to be 1.8% which shows a value closely related to our studies [20]. In Botswana, seroprevalence of 4.3% was reported by Creek et al and 2.2% seroprevalence was cited by other researchers in Burkina Faso in pregnant women attending antenatal clinic [2,21]. A study in Ibadan, a city very close to our study centre in South Western Nigeria also reported a low prevalence of 0.13% from a study population of 2318 antenatal clinic patients in 2010 [1]. Several factors could account for these highly varied findings, including, the duration and size of studies, educational background, cultural and traditional practices, sexual partners, access to health information on Sexual Transmitted Infection (STI) and other health care related programs as reported in several African countries and also the level of public awareness about the activities of several agencies across the nation [22]. In some studies, syphilis was not detected from samples, for instance, in Afghan women receiving antenatal care at three governments' maternity hospital in Kabul, out of 4452 pregnant women recruited, there was no positive case of syphilis [23].

Our study also emphasizes the need for all positive cases on RPR test to be subjected to confirmatory tests to ascertain the presence of the infection. Our study was limited by the, very few number of positive cases, this made statistical inferences difficult. Furthermore, it would have been desirable in our sample processing to include the ICT syphilis test which is a rapid test that the WHO has endorsed as an affordable, sensitive and specific test for diagnosing syphilis [24]. The positive cases reported in this study were from those with either no formal education or only primary education suggestive of an association between syphilis

and low socioeconomic class in the population. Low socioeconomic status has been reported to be one of the factors associated with syphilis and our finding is in support of this [10]. An increase in the level of education of women will generally improve their socioeconomic status and might thus lead to a reduction in the prevalence of this disease.

Even though those with positive results were asymptomatic at study centers, efforts to treat them promptly with antibiotics such as Benzathine penicillin by intramuscular injection cannot be overemphasized. Therefore, the antenatal care givers were notified about those who had positive results for prompt treatment. In view of our findings, it will be necessary to continue the screening for syphilis among the Obstetric population because of the serious problems of morbidity and mortality associated with untreated maternal syphilis also the finding that syphilis is capable of re-emerging extremely rapidly in populations when prevention efforts are neglected. [1].

5. CONCLUSION

In conclusion, there is the need to continue routine screening of pregnant women for syphilis. This can be accomplished by means of a simple affordable, rapid on-site test kit for syphilis affordable by all antenatal clinic attendees. Testing will allow for prompt identification of infection followed by immediate treatment of both partners. Prompt detection and treatment will result in a significant reduction in the prevalence this disease in our pregnant women and the population at large.

CONSENT

Before recruitment for the study, the procedure was explained to the participants and Informed consent was sought and obtained from them.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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