



Overview of Prevalence of Syphilis in a Health Facility in Rivers State

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Authors' contributions

This work was carried out in collaboration between both authors. Author AG designed the study, performed the statistical analysis and wrote the protocol. Author TTE wrote the first draft of the manuscript, managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Syphilis is one of the sexually transmitted diseases that is prevalent in developing countries and is of public health importance. Among pregnant women, it is reported to cause foetal defects if not treated. This study was thus carried out to determine the prevalence of syphilis among pregnant women visiting a health facility in Rivers State. Records of 482 pregnant women who visited the health facility within January and December 2018 were reviewed after obtaining due consent from the relevant authority. The sensitivity rate of the RPR test was higher than the THPA test, however the THPA has been found to be more specific. A prevalence rate of 2.28% was reported among the samples collected. The women who tested positive had little or no formal education which may have contributed to low knowledge of the disease. Intensive public health awareness on the means of transmission, symptoms, signs and effects of contracting the disease, especially among pregnant women should be carried out. Also, robust screening should be carried out at the community level in order to have proper record of the number of persons infected. Rapid test kits that are reliable should be made available also.

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1. INTRODUCTION

Sexually transmitted diseases (STDs) are a group of infectious or pathogenic diseases in which the major mode of transmission is through sexual contact. They are among the main causes of diseases worldwide, particularly in developing nations [1]. Some prevalent sexually transmitted illnesses include bacterial vaginosis, herpes, Chlamydia, trichomoniasis, gonorrhoea, HIV and syphilis [2]. More than 25 infectious organisms are mainly transferred through sexual activity, and studies have shown that STDs are among the many associated variables that influence the reproductive health continuum [3]. Documented evidence indicates that STDs can be transmitted from a pregnant mother to the baby before, during or after the baby's birth and that some STDs (like syphilis) can cross the placenta and infect the baby in-utero [4].

Syphilis is a chronic bacterial infection caused by *Treponema pallidum* that is endemic in low-income countries and occurs at lower rates in middle-income and high-income countries. It can cause serious health problems if left untreated [5]. *T. pallidum* belongs to the spirochete class and is a corkscrew-shaped, motile microaerophilic bacterium that requires a live rabbit-model system for growth and cannot be viewed by normal light microscopy. Syphilis has often been called "the great imitator" because so many of the signs and symptoms may be difficult to differentiate from those of other diseases [6,7,8,9].

The disease is of both individual and public health importance and, in addition to its direct morbidity, increases risk of HIV infection by two to five times and coinfection is common; also it can cause lifelong morbidity in children born to infected mothers. Without treatment the disease can progress over years through a series of clinical stages and lead to irreversible neurological or cardiovascular complications [9]. Unless prompt diagnosis and treatment of syphilis are performed, serious complications including male and female infertility many result, and in pregnancy, adverse outcomes such as still-birth, prenatal death and serious neonatal infection may result [10].

Syphilis progresses through four stages which are primary, secondary, latent and tertiary stages. Reported cases of primary and

secondary syphilis more accurately represent the incidence of syphilis than reported cases of latent infection, particularly late latent syphilis, which signifies infection acquired more than a year before syphilis is diagnosed [5]. In 2008, the world health organization (WHO) estimated that 36.1 million people were infected with syphilis worldwide. It is estimated that there are more than 12 million new syphilis infections every year in the world of which 90% of case are found in developing countries. The WHO reported that the annual cases of syphilis in African region are among adults aged 15-49years.

2. STAGES OF SYPHILIS

2.1 Primary Syphilis Symptoms

The first symptom of syphilis infection is usually a small, painless sore in the area of sexual contact (penis, vagina, rectum or mouth) and because this sore is painless, it can easily go unnoticed. So many people do not realize that they are infected. The sore usually appears about 2-6 weeks after exposure and disappears within a few weeks, regardless of whether or not you receive treatment [11]. Even after the sore goes away one must still receive treatment in order to stop the infection from moving to the secondary stage.

2.2 Secondary Syphilis Symptoms

Shortly after the sore heals symptoms of this phase appear. During this stage one may develop a non-itchy rash on the entire body especially the palms of the hands or soles of the feet and flat warts (condylomatalata). Other symptoms include fever, swollen lymph glands, sore throat, patching hair loss, headache, weight loss and fatigue [7].

2.3 Latent and Tertiary Syphilis

This is the period during which there is no a visible sign or symptoms of the disease. This period can last from 2-30 years after the client is infected [12]. A blood test called VDRL (Venereal Disease Research Laboratory) is the only way to make a definite diagnosis during this period. In tertiary syphilis, the symptom can occur from 12-30 years after the initial infection. During this stage it could affect many different organs which include the eyes (ocular syphilis), heart, blood

vessels, brain and nervous system (neurosyphilis) which could result to death [13].

2.4 Prevalence of Syphilis

Syphilis is more prevalent among sexually-active persons aged 19-29 years. In African countries, prevalence of syphilis has been reported to be 2% in Cotonou, 4% in Kisumu (Kenya), 6% in Yaounde (Cameroon) and 14% in Ndola (Zambia) women. In Nigeria a prevalence of 3% was recorded in the Federal medical centre (FMC) Abakaliki, Ebony State [14]. In a study by Donbraye *et al.* in Ibadan, 6.0% prevalence was reported [15].

The WHO produces global and regional syphilis prevalence and incidence estimates for adult women roughly every four years. The most recent estimate was done in 2012, when WHO estimated that the global prevalence of syphilis in adult men and women was 0.49% and there were 350,000 adverse pregnancy outcomes in infected pregnant women [16].

2.5 Aim and Objectives of the Paper

The aim of the study was to determine the prevalence of syphilis among pregnant women attending antenatal clinic in a health care facility in Rivers State.

The objectives of the study were:

1. To ascertain the characteristics (age, trimester and educational attainment) of the pregnant women in the study;
2. To ascertain the test procedure utilized to confirm the syphilis cases.
3. To determine the prevalence of syphilis among the pregnant women.

3. METHODOLOGY

The study is a review of existing records of pregnant women who had visited the Rivers State University Teaching Hospital (RSUTH) formerly Braithwaite Memorial Hospital (BMH), in Rivers State from January to December, 2018 and referred to the Microbiology laboratory of the facility, where a total of 482 registered pregnant women attending the antenatal clinics were tested. The health care facility serves majority of women in this area. The collected sera had been tested by the qualitative rapid plasma reagin (RPR) test using a RPR-Slide TM test kit

(CalTech Diagnostics Inc., Chino, California, USA). All reactive sera were 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. The records were reviewed after obtaining due consent from the relevant authority of the health facility.

4. RESULTS

Table 1 shows the age range and trimester of the pregnant women attending the facility within the period of study. The table shows that 482 samples were collected and screened whose ages ranged from 18-40 years. Of this number, 173 were within their first trimester, 270 within their second trimester and 39 within their third trimester. Table 2 shows the characteristics of the women who tested positive for syphilis infection. Of the 482 samples, 15 (3.11%) were positive for RPR; while the others were nonreactive. Eleven of the 15 reactive RPR samples were positive for TPHA, giving a 2.28% prevalence rate. The confirmed prevalence rate was thus 2.28%. Of the 15 women positive for RPR, 4 (26%) had only primary education, while the remaining 11 (74%) were without any formal educational. The titre values of reactive samples on RPR ranged from 1:2 to 1:8 with all the 11 positive samples that were confirmed as syphilis on TPHA having titres of 1:8.

Table 1. Characteristics of pregnant women attending antenatal clinic at RSUTH

No of women	482
Age range (Years)	18-40
Trimester	
1 st Trimester	173
2 nd Trimester	270
3 rd Trimester	39

5. DISCUSSION

Sexually Transmitted Infections including syphilis are common in pregnancy in Nigeria [17]. Several studies have demonstrated that pregnant women may have syphilis [18]. The RPR is seen as a highly sensitive test but less specific compared with the TPHA which is a confirmatory test for syphilis. This explains the difference in test results obtained by the two tests as RPR is a qualitative test while TPHA is a quantitative test and more reliable than the former [19]. The

Table 2. Characteristics of positive samples to RPR and TPHA tests among the pregnant women

S/N	RPR titre	TPHA	Age	Trimester	Education
1	1.2	-	30	2 nd	Pry
2	1.8	+	27	2 nd	None
3	1.4	-	33	2 nd	Pry
4	1.8	+	28	3 rd	None
5	1.8	+	32	2 nd	None
6	1.8	+	27	2 nd	None
7	1.4	-	29	3 rd	Pry
8	1.8	+	34	2 nd	None
9	1.8	+	30	2 nd	None
10	1.8	+	29	2 nd	None
11	1.8	+	34	1 st	None
12	1.8	+	26	2 nd	Pry
13	1.4	-	31	1 st	None
14	1.8	+	33	2 nd	None
15	1.8	+	28	2 nd	None

prevalence of syphilis reported in this study was 2.28% which is slightly higher than the 2.2% and 1.98% reported in similar studies carried out at the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria in 2014 and 2019, respectively [20,21]. Similarly, it is higher than the 0.4%, 1.5% and 1.7% recorded in Yola, Benin and Ilorin, respectively [22,23,24]. It is however lower than the 5.0% and 10.0% reported in Yenagoa and Osogbo, respectively [25,26]. The report by Opone *et al.* recorded a prevalence of 1.42% and 2.63% in the rural and urban areas, respectively [21]. A study in Ibadan, a city in South Western Nigeria also reported a low prevalence of 0.13% from a study population of 2318 antenatal clinic patients in 2010 [27].

In Mozambique, a prevalence of high prevalence rate of 18.3% was reported in antenatal care attendees, and a much lower rate of 5% seroprevalence was reported in pregnant women in Malawi [28,29]. In India, seroprevalence of syphilis was reported to be 1.8% which shows a value closely related to our study [30]. In Botswana, seroprevalence of 4.3% was reported by Creek *et al.* and 2.5% seroprevalence was cited by other researchers in Burkina Faso in pregnant women attending antenatal clinic [31,32].

This disparity in the prevalence of syphilis may be attributed to factors such as the difference in number of pregnant women visiting the health facilities, testing used and well as time or period of sampling. The differences in sexual behaviours and practices of persons in the study

areas may have contributed to the different prevalence rate reported. Also, access to STIs diagnosis and treatment, duration and size of studies, educational background, geographical differences and cultural and traditional practices may have also contributed to this discrepancy. 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 are other factors that may have affected the prevalence. Also most of these studies focused on health facilities located in urban areas with little focus on the rural areas. Studies have however shown that developing and underdeveloped countries usually record higher prevalence compared with that of developed countries [21].

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 infection and educational status. The study by Opone *et al.* reported low educational status as a risk factor for contracting syphilis [21]. 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 the study centre, efforts to treat them promptly cannot be overemphasized. People who engage in unprotected sex, promiscuous sex, prostitution and intravenous drug use, as well as female with frequent sex for

money are at major risk of contracting the disease. Health workers also are at occupational risk.

6. CONCLUSION

The study was carried out to determine the prevalence of syphilis in a health facility located in Port Harcourt where a prevalence rate of 2.28% was reported among the 482 pregnant women visiting the antenatal clinic. This value was similar to that recorded by some authors in other regions. Also, the RPR test recorded a prevalence of 15 positive whereas the confirmatory test (TPHA) recorded 11 positive cases of the 15 which was reported as the prevalence. The educational status of the women was believed to be associated with this prevalence as most of the women who were positive to syphilis had little or no formal education. There is the need to continue routine screening of pregnant women for syphilis and this can be accomplished by means of a simple affordable, rapid on-site test kit for syphilis affordable by all antenatal clinic attendees. Community screening 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 of this disease among pregnant women and the population at large. Although, most persons with untreated syphilis do not develop last phase symptom, it can affect different organ systems of the human body. Elimination in Rivers State is thus possible through treatment and public health education.

7. RECOMMENDATIONS

Based on the findings from the paper, the following recommendations were made:

- i. Public enlightenment campaign and sensitization of public on its spread through the media;
- ii. Elimination through abstinence;
- iii. Reduction of chances of sexual transmission through the use of latex condom (barrier protection).
- iv. The use of disinfectants in toilets;
- v. Introduction of sex education and counselling in public schools and churches/worship centres;
- vi. The young adolescent should be encouraged to visit a youth friendly health centre;

- vii. Screening and notification of the disease should be carried on commercial sex workers and they should be discouraged by empowering them to go into skill acquisition;
- viii. Further studies on the screening for syphilis among the obstetric population because of the serious problems of morbidity and mortality associated with untreated maternal syphilis should be carried out.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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