

Prevalence of *Treponema Pallidum* in Serum of Pregnant Women in Abeokuta, Ogun State, Nigeria**Ogiogwa JI¹, Akingbade OA¹, Aboderin BW¹, Okerentugba PO², Innocent-Adiele HC², Onoh CC³, Nwanze JC³, Okonko IO²**¹Department of Microbiology and Parasitology, Federal Medical Centre, Abeokuta, Ogun State, Nigeria²Department of Microbiology, University of Port Harcourt, East-West Road, P.M.B. 5323, Choba, Port Harcourt, Rivers State, Nigeria;³Department of Pharmacology and Therapeutics, Igbinedion University, Okada, Edo State, Nigeria
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Abstract: Syphilis is a multifaceted disease with serious implications for the pregnant women and the unborn foetus. *Treponema pallidum*, the causative agent of syphilis has been a public health challenge for centuries. Sexually transmitted infections (STIs) and HIV/AIDS are widespread in the developing countries, and constitute a major public health problem in Sub-Saharan Africa. Information regarding the prevalence of syphilis in Pregnant Nigerian women is scanty from the South-west zone of Nigeria. One thousand two hundred and fifty six pregnant women, who attended the antenatal clinic of the Federal Medical Centre, Abeokuta, Nigeria from January 2011 to December, 2011 were screened for syphilis using Venereal Disease Research Laboratory (VDRL) reactive technique. Seropositive samples were confirmed using immunochromatographic test strips which are specific for *Treponema pallidum*. The results showed that 4(0.32%) of the 1,256 pregnant women were positive for antibody to *Treponema pallidum*. The serodynamic of *Treponema pallidum* in relation to age showed an increase in infection rate of 4.0%, 0.26% and 0.17% among pregnant women in age groups of 36-40, 26-30 and 31-35 years respectively, while 16-20, 21-25, 41-45 and 46-50 years age groups had a zero percent prevalence of the organism. This study has further provided information on the prevalence of *Treponema pallidum* among pregnant women in Abeokuta, Nigeria.

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1. INTRODUCTION

Syphilis is believed to have infected 12 million people in 1999, with greater than 90% of cases in the developing world (Stamm, 2010). It affects between 700,000 and 1.6 million pregnancies a year, resulting in spontaneous abortions, stillbirths, and congenital syphilis. In sub-Saharan Africa, syphilis contributes to approximately 20% of perinatal deaths (Woods, 2009). Rates are proportionally higher among intravenous drug users, those who are infected with HIV and men who have sex with men (Coffin et al., 2010). Syphilis occurs throughout the world. It is more common among the under-privileged, in cities than rural areas and in blacks than whites (Stewart and Brooks, 1971).

Syphilis is a venereal disease caused by infection with the spirochaete, *Treponema pallidum*. It can be acquired through exposure to infected blood and sexual exposure. *Treponema pallidum* is able to cross the placenta in pregnant women and result in fetal infection (Peeling and Hook, 2006). The overall picture in Nigeria about syphilis is still unclear as there are no reliable statistics on its prevalence. The clinical impression however is based on diminishing number of patients presenting with symptoms of the

disease at urban Hospitals and the rarity of cardiovascular and neurosyphilis (FMOH, 2004).

Reported prevalence of *Treponema pallidum* seroreactivity in pregnant women attending antenatal clinic vary from one country to the other. For instance Brazil and Costa Rica found a seroevidence rate of 8% in 1987 and 6% in 1988 in two different Hospitals (Marra et al., 2002). These results of seroprevalence obtained in these countries have been overcome by recent work in some part of the world especially in sub Sahara Africa like Mozambique (Gloyd et al., 2007) and Tanzania (Jones et al., 2005). In recent years and in the United States, health officials reported over 32,000 cases of syphilis in 2002 and approximately 3,400 newborns acquire the infection from their mother before or during birth. STIs are widespread in the developing countries and constitute a major public health problem in sub-Saharan African. More recently, there has been a resurgence of syphilis (Olokoba et al., 2008).

Testing for *Treponema pallidum* (syphilis) in pregnancy and labour is medically indicated because of the potential risk for congenital

infection and foetal loss (Ratnam et al., 1982). *Treponema pallidum* (syphilis) has also acquired a new potential for morbidity and mortality through association with increased risk for HIV infection (Ratnam et al., 1982). Information regarding *Treponema pallidum* (syphilis) infection in pregnancy in Nigeria shows a wide geographical variation in seroprevalence. There is sparse information on the disease from the South-west zone. We therefore, investigated the occurrence of *Treponema pallidum* (syphilis) infection amongst pregnant women in Abeokuta as a major city in south-west zone.

The growing recognition of the major role that sexually transmitted infections play in reproductive health, the worldwide epidemic of these infections and their reproductive sequel it demands greater commitment to their prevention and control. Much attention is being focused on the second generation of sexually transmitted infections. However, it is important to remain vigilant to the serious sequel of syphilis, especially in areas where the first generation of sexually transmitted disease are rampant and have not been controlled. There is no doubt that this study will help to prevent further spread and prevent the adverse pregnancy outcome cause by this deadly organism. This prospective study was designed to determine the prevalence of *Treponema pallidum* antibody among antenatal clinic patients in Abeokuta, Ogun State in Nigeria.

2. MATERIALS AND METHODS

2.1. Target area and population:

This study focuses on pregnant women attending antenatal clinic (ANCS) in Federal Medical Centre, Abeokuta, Ogun State, Nigeria. 1256 pregnant women at their trimester attending the Obstetric and Gynecology clinic of Federal Medical Centre, Abeokuta were recruited between January, 2011 and December, 2011. In this study sociodemographic variables of the women were also assessed in form of verbal questionnaire i.e. Age, sex and present clinical history etc. Sera were obtained from them by trained phlebotomists.

2.2. Collection and seroanalysis of samples:

All the recruited pregnant women were screened using Nonspecific venereal disease research laboratory (VDRL) seroreactivity against *Treponema pallidum* infection, confirmed by Immunochromatographic (IC) test strips which are specific for *Treponema pallidum*. All pregnant women dually reactive to VDRL and IC were considered as having active *Treponema pallidum* (syphilis). Except for the control, consent was not

necessary because the test is mandatory for all first and trimester women at the Gynecological clinics.

2.3. Data Analysis: The data obtained in this study were analyzed using the Statistical Package for Social Sciences (SPSS, version 19.0) statistical software.

3. RESULTS ANALYSIS

A total of 1256 samples were collected, the highest number of samples (452) were collected in the first quarter of the month while lowest samples were collected during the second quarter (Table 2). Out of 1256 antenatal Clinic patients screened for the serodynamism of *Treponema pallidum* antibody, 4(0.3%) were seropositive. The age of the patients ranged from 16-50 with a mean age of 33 year. There was a steady increase in the seropositive cases among age group of the patients, with a peak in the 36-40 and a decline towards the 41-45 and 46-50 age groups. Majority of the seropositive cases were in the age group of 36-40. The 16-20, 21-25 and 41-45years age groups recorded zero prevalence (Table 1).

Table 1: Age classification of antenatal patients with seropositive *Treponema pallidum* within the period under investigation

Age groups (years)	No. Tested	No. Positive (%)
16-20	48	0(0.0)
21-25	152	0(0.0)
26-30	596	1(0.2)
31-35	384	1(0.3)
36-40	48	2(4.2)
41-45	16	0(0.0)
46-50	12	0(0.0)
Total	1256	4(0.3)

The quarterly seroevidence pattern of *Treponema pallidum* among antenatal women from January 2011 to December 2011 shows that the highest positive reactive incidence was found the third quarter of the year (July –December 2011) (Table 2). There was no statistical difference in the seroevidence of *Treponema pallidum* in the year under investigation ($P>0.05$)

Table 2: Quarterly seroevidence pattern of treponema pallidum among antenatal women from January 2011 to December 2011

Quarterly (Months)	No. Tested	No. Positive (%)
1 st	352	1(0.3)
2 nd	273	0(0.0)
3 rd	327	2(0.6)
4 th	304	1(0.3)
Total	1256	4(0.3)

4. DISCUSSION

The common STD/STIs in Nigeria are gonorrhoea, candida, trachoma vaginalis, genital Chlamydia and syphilis (Ratnam *et al.*, 1982). Studies have shown that pregnant women may have syphilis (Ratnam *et al.*, 1982; FMOH, 2004). From this study, the prevalence of *Treponema pallidum* (syphilis) infection in pregnant women was 0.3%. This figure is within the national average for *Treponema pallidum* (syphilis) in pregnant Nigerian women of 0.3% (FMOH, 2004). It is lower than the 0.13% found in Enugu, South eastern Nigeria. Lindstrand *et al.* (1993), working in Osogbo, South-western Nigeria, found a seroprevalence rate of 2.9%. Aboyeji and Nwabuisi (2003) found a seroprevalence rate of 1.7% in their work in Ilorin, which is higher than the prevalence rate of 0.3% obtained in this study.

Reports from outside Nigeria show a wide geographical variation. The sero-prevalence rate of *Treponema pallidum* syphilis found in this study is lower than 0.49% found in pregnant Italian women (Todd *et al.*, 2008) and it is also lower than the 12.5% found in pregnant women in Zambia (Ratnam *et al.*, 1982). It is also lower than the 18.3% found in antenatal care attendees in Mozambique (Lindstrand, 1993). Similarly, it is lower than the 5% found in pregnant women in Malawi (Munkhu *et al.*, 2006). However, no case of syphilis infection was found in the 4,452 pregnant Afghanistan women receiving antenatal care at three Government maternity hospitals in Kabul (Todd *et al.*, 2008).

The differences in the seroprevalence of *Treponema pallidum* syphilis infection in the different populations of pregnant women within and outside Nigeria from literatures might be a reflection of the variation in sexual practice and sexual behaviour of the communities where the studies were carried out. It may also be due to geographical variation, difference in accessibility to treatment of STIs, cultural practices, and differences in the laboratory techniques employed to detect *Treponema pallidum* syphilis infection. The much higher seroprevalence rates found for syphilis from

Southern Africa (i.e. Zambia, Malawi and Mozambique) might be due to the higher prevalence rates of HIV/AIDS infection in that part of Africa.

The implication of *Treponema pallidum* (syphilis) infection in pregnancy is the severe impact on pregnancy outcome, primarily as spontaneous abortion still birth and vertical transmission resulting in congenital syphilis (Olokoba *et al.*, 2009). The 41-50 years old patient who were mainly from invitro fertilization programme had zero prevalence recorded and could be attributed to the low number of patients in this group and also reduced sexual activity among them. The insignificance ($P>0.05$) in relation to the one year study shows that the infections is non-seasonal and does not follow a particular trend. It is still advisable for pregnant women to be screened for *Treponema pallidum* (syphilis) because the disease is treatable, and it will help eliminate the adverse effects of untreated *Treponema pallidum* (syphilis). In conclusion, sexually transmitted disease programme should be re-enforced to assess syphilis screening and treatment to eliminate the scourge of the disease in this period of HIV infection.

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