SERODYNAMICS OF TREPONEMA PALLIDUM IN SERUM OF PREGNANT WOMEN IN BENIN CITY

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ABSTRACT

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-south zone of Nigeria. Ten thousand six hundred and eighty antenatal clinic patients who attended the University of Benin Teaching Hospital and Central Hospital from January 2006 to December 2008 were screened for syphilis using Venereal Diseased Research Laboratory (VDRL) reactive technique. All those that were positive with this method were confirmed with immunochromatographic test strips which are specific for Treponema pallidum. 157(1.5%) out of the ten thousand six hundred and eighty (10,680) were positive for antibody to Treponema pallidum. The serodynamic of Treponema pallidum in relation to age showed an increase in infection rate of 1.8% and 1.6% among pregnant women in age groups of (23-27) and (28-32) respectively, while 48-52 years age group had a zero percent prevalence of the organism, There was no statistical difference in the seroevidence of Treponema pallidum in the years under investigation (P>0.05). It is therefore suggested and advised that due to the adverse pregnancy outcome caused by Treponema pallidium, the screening of antenatal clinic patients should be made mandatory in both urban and rural healthcare centres where there is antenatal care and management.

Keywords: Treponema pallidum Serology, Pregnant women.

INTRODUCTION

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[1].

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[2].

Recently, the number of syphilis cases in the United States has slightly increased. The Centers for Disease Control and Prevention (CDC) reported that, from 2003-2004, the rate of primary and secondary syphilis increased 8%, from 2.5 to 2.7 cases per 100,000 population. Preliminary 2007 syphilis data showed that the US rate of primary and secondary syphilis increased 12% between 2006 and 2007, from 3.3 to 3.7 cases per 100,000 populations.

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[3]. 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[4] and Tanzania[5]. 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[6]. Testing for Treponema pallidum (syphilis) in pregnancy and labour is medically indicated because of the potential risk for congenital infection and foetal loss[7] Treponema pallidum (syphilis) has also acquired a new potential for morbidity and mortality through association with increased risk for HIV infection[6]

In women suspected of being at increased risk for syphilis or for populations in which there is a high prevalence of Treponema pallidum (syphilis), additional tests should be performed during the third trimester at twenty-eight weeks and again at delivery. Seropositive women should be considered infected and should be treated unless prior treatment with fall in antibody titre is medically documented. 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-south zone. We therefore, investigated the occurrence of Treponema pallidum (syphilis) infection amongst pregnant women in Benin as a major city in south-south zone.

This prospective study was designed to determine the serodynamic of Treponema pallidum antibody among antenatal clinic patients in Benin City, Edo state in Nigeria. There is no doubt that this attempt we help to prevent further spread and prevent the adverse pregnancy outcome cause by this deadly organism.

MATERIALS AND METHODS

Target area and population: This study focuses on pregnant women attending antenatal clinic (ANCS) in University of Benin Teaching Hospital and Central Hospital Benin city, Edo state, Nigeria.

10,680 pregnant women at their trimester attending the obstetric and Gynecology clinic of university of Benin Teaching Hospital and Central Government Hospital in Benin City were recruited between May 2006 and December 2008. In this study sociodemograpic variables of the women were also assessed in form of verbal questionnaire i.e Age, sex, parity, level of education, past and present clinical history etc. Sera were obtained from them by trained phlebotomists and 268 age-match

women with their fetus alive were used as control.

Collection and seroanalysis of samples: All the recruited pregnant women were screened using Non-specific 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.

RESULTS

Out of 10,680 antenatal Clinic patients screened for the serodynamism of Treponema pallidum antibody, 157(1.5%) were seropositive. The age of the patients ranged from 18-52 with a mean age of 28.8. There was a steady increase in the seropositive cases among age group of the patients, with a peak in the 28-32 and 23-27 and a decline towards the 48-52 age groups **(Table 1)**. Majority of the seropositive cases were in the age group of 23-27 and 28-32 (i.e 1.8% and 1.6%). The 48-52 years age groups recorded zero prevalence **(Table 1)**.

The data obtained in this study were analysed using the Statistical Package for Social Sciences (SPSS, version 10.0) statistical software. There was no statistical difference in the seroevidence of Treponema pallidum in the years under investigation (P>0.05)

Table 3 depict characterization of level of education of investigated pregnant women as majority of the women tested were educated up to secondary and tertiary level with 6.2% and 92.0% respectively.

TABLE1: AGE CLASSIFICATION OF ANTENATAL PATIENTS WITH SEROPOSITIVE TREPONEMA PALLIDUM WITHIN THE PERIOD UNDER INVESTIGATION

Age(yrs)	No examined	Numbers positive	% positive
18-22	622	3	**0.5**
23-27	3,600	66	**1.8**
28-32	4,210	69	**1.6**
33-37	1,056	11	**1.0**
38-42	880	6	**0.7**
43-47	300	2	**0.7**
48-52	12	0	**0.0**
Total	**10,680**	**157**	**1.5**

TABLE 3: YEARLY SEROEVIDENCE PATTERN OF TREPONEMA PALLIDUM AMONG ANTENATAL WOMEN FROM JANUARY 2006TO DECEMBER 2008

Year	Total Number Screened	No. Positive	% Positive
2006	3560	49	**1.4**
2007	3490	58	**1.7**
2008	3630	50	**1.4**
Total	**10,680**	**157**	**1.5**

TABLE 3: CHARACTERIZATION OF LEVEL OF EDUCATION OF INVESTIGATED PREGNANT WOMEN

Level of Education	Frequency	(%)
None	19	**0.1**
Primary	111	**1.0**
Secondary	722	**6.7**
Tertiary	9828	**92.0**
Total	**10,680**	**24.9**

DISCUSSION

The common STD/STIs in Nigeria are gonorrhoea, candida, trachoma vaginalis, genital Chlamydia and syphilis[7]. Studies have shown that pregnant women may have syphilis[1,2,5]. From this study, the prevalence of Treponema pallidum (syphilis) infection in pregnant women was 1.5%. This figure is higher than the national average for Treponema pallidum (syphilis) in pregnant Nigerian women of 0.3%[2]. It is also higher than the 0.13% found by in Enugu, South-eastern Nigeria[8], working in Osogbo, South-western Nigeria, found a seroprevalence rate of 2.9%[9] while found a seroprevalence rate of 1.7% in their work in Ilorin, which is similar to the prevalence rate of 1.5% obtained in this study. Reports from outside Nigeria also show a wide geographical variation. The seroprevalence rate of Treponema pallidum syphilis found in this study is higher than 0.49% found in pregnant Italian women[11] and lower than the 12.5% found in pregnant women in Zambia[7]. It is also lower than the 18.3% found in antenatal care attenders in Mozambique[8]. Similarly, it is lower than the 5% found in pregnant women in Malawi[10]. However no case of syphilis infection as found in the 4,452 pregnant Afghan women receiving antenatal care at three Government maternity hospitals in Kabul[11]. The differences in the seroprevalence of Treponema pallidum syphilis infection in the different populations of pregnant women within

and outside Nigeria from the literature 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 impart on pregnancy outcome, primarily as spontaneous abortion still birth and vertical transmission resulting in congenital syphilis[12].

The 48-52 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 three years study shows that the infections is non-seasonal and does not follow a particular trend.

The study shows or suggests gradual increase in the seroprevalence of Treponema pallidum in Benin City. 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).

Sexually transmitted disease programme should be re-enforced to have assess to syphilis screening and treatment to eliminate the scourge of the disease in this period of HIV infection.

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