

## SYPHILIS

# Screening for syphilis during pregnancy in Nigeria: a practice that must continue

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**Objective:** To determine the seroprevalence rate of syphilis among pregnant women attending the antenatal clinics of a teaching and a state specialist hospital in Nigeria, in order to ascertain whether maternal screening should be incorporated into routine antenatal care of our hospitals.

**Methods:** A screening for syphilis for 505 newly registered pregnant women was carried out using the qualitative rapid plasma reagin (RPR) test. All reactive sera were then subjected to the quantitative RPR test to estimate the titre of each sample. The *Treponema pallidum* haemagglutination antibody (TPHA) test was used as confirmatory test of all positive RPR sera.

**Results:** A total of 50 women (9.9%) were positive for RPR; 15 (2.97%) were positive for TPHA, giving a seroprevalence rate of 2.97%. A total of 32 women (6.34%) were RPR positive at 1:2, 7 (1.39%) at 1:4 and 11 (2.2%) at 1:8. Of the women positive for RPR at 1:2, 2 were also TPHA positive, 2 of the 7 positive at 1:4 were TPHA positive, while all 11 positive women at 1:8 were TPHA positive. In all, 70% of all RPR positive women screened were biological false positives. Eleven of the 15 women had high titre active syphilis (RPR  $\geq$ 1:8, TPHA+) while 4 had low titre active syphilis (RPR <1:8, TPHA+).

**Conclusions:** The 2.97% seroprevalence rate obtained after accounting for biological false positives was considered high. Screening for syphilis in pregnancy should be incorporated into routine antenatal practice in Nigerian hospitals.

Routine serological testing for syphilis during pregnancy has been performed in many countries<sup>1</sup> for over 50 years, and in a few tertiary health institutions in Nigeria since the 1960s.<sup>2,3</sup> Rates of seropositive pregnant women reported in Nigeria over a 30-year period have been put between 0.6–2.3%<sup>2–4</sup> while generally in Africa the figure is in the range of 3–18%.<sup>5–7</sup>

While syphilis during pregnancy in the Western world today is rare<sup>8,9</sup> largely due to effective antenatal screening, maternal syphilis resulting in abortions, still births and congenital syphilis remains an increasing problem in many countries of sub-Saharan Africa.<sup>5,7</sup> Despite the cost effectiveness of screening even at low prevalence rates in some African countries,<sup>7</sup> in Nigeria, there is no national policy for antenatal screening. There is hence no consensus among obstetricians in Nigerian hospitals on the need for routine antenatal screening.

The aim of this cross-sectional study was to determine the seroreactivity of pregnant women to syphilis in Nigerian hospitals in order to justify or not the need for routine antenatal screening.

## METHODS

A total of 505 consecutive newly registered pregnant women attending the antenatal clinics of Ladoko Akintola University Teaching Hospital and the State Specialist Hospital, Osogbo, Nigeria between April 2004 and March 2006 were studied.

Informed consent from each participant and the approval of the Ethical/Research Committees of the hospitals was obtained.

Venous blood (5ml) was collected from the antecubital vein of each woman into sterile tubes. The blood was allowed to retract and then centrifuged, and the serum was obtained and stored at  $-20^{\circ}\text{C}$  until tested. All serum samples, test antigens and control samples were brought to room temperature ( $26^{\circ}\text{C}$ ) and tested by the qualitative rapid plasma reagin (RPR) test using a RPR-Slide<sup>TM</sup> test kit (Cal-Tech Diagnostics Inc., Chino, California, USA). All reactive sera were then subjected to the quantitative RPR test to estimate their titres. The *Treponema pallidum* haemagglutination antibody (TPHA) test was used as a confirmatory test for all positive RPR sera.

## RESULTS

A total of 505 women were screened. The age range was 20–45 years (mean age 29.5 years); 226 (44.8%) patients were primigravidae and 279 (55.2%) multigravidae; 191 (37.8%) were in the first trimester, 280 (54.5%) in the second trimester and 34 (6.7%) in the third trimester (table 1).

A total of 50 (9.9%) women were positive for RPR, from which 15 (2.97%) were confirmed by positive TPHA to have active syphilis; 32 women (6.34%) had RPR at 1:2, 7 (1.39%) at 1:4 and 11 (2.2%) at 1:8 (table 2).

Two of the women positive for RPR at 1:2 were also positive for TPHA, 2 of the 7 positive at 1:4 were also TPHA positive, while all 11 RPR positive women at 1:8 were also TPHA positive. In all, 70% of all RPR positive women corresponding to 6.93% of all women screened were biological false positives.

Of the 15 women with active syphilis, 11 had high titre active syphilis (RPR  $\geq$ 1:8, TPHA+) while 4 had low titre active syphilis (RPR <1:8, TPHA+). Of the women with active syphilis, 3 were in the first trimester, 5 in the second trimester and 7 in the third trimester. They all received a single dose intramuscular injection of 2.4MU benzathine penicillin.

**Table 1** Parameters of pregnant women attending antenatal clinics of two Government-owned hospitals in Osogbo, Southwestern Nigeria

	LAUTECH Teaching Hospital	State Specialist Hospital	Totals (%)
No. of women	220	285	505
Age (years)	20–45	20–43	20–45
Mean age	30 $\pm$ 3.5	28 $\pm$ 2.6	29.5 $\pm$ 4.5
Gravidity:			
Primigravid	102	124	226 (44.8)
Multigravid	118	161	279 (55.2)
Trimester:			
First	83	108	191 (37.8)
Second	122	158	280 (54.5)
Third	15	19	34 (6.7)

**Table 2** Seroprevalence of syphilis in 505 pregnant women at the antenatal clinics of two Government-owned hospitals in Osogbo, Southwestern Nigeria

	Quantitative	RPR +ve (%)	TPHA +ve (%)	TPHA -ve (%)
LAUTECH Teaching Hospital (220 patients)	1:2	14 (6.4)	2 (0.9)	12 (5.5)
	1:4	4 (1.8)	1 (0.5)	3 (1.4)
	1:8	5 (2.3)	5 (2.3)	0
Subtotal		23 (10.5)	8 (3.6)	15 (6.8)
State Specialist Hospital (285 patients)	1:2	18 (6.3)	0	18 (6.3)
	1:4	3 (1.1)	1 (0.4)	2 (0.7)
	1:8	6 (2.1)	6 (2.1)	0
Subtotal		27 (9.5)	7 (2.5)	20 (7.0)
Total (505 patients)		50 (9.9)	15 (2.97)	35 (6.9)

## DISCUSSION

The seroprevalence of syphilis as measured by RPR in this study was 9.9% however, 70% of these were biological false positives. The true seroprevalence therefore was 2.97%. This figure is slightly higher than the range of 0.6–2.3% reported over a 30-year period in Nigeria<sup>2-4</sup> but falls within the 3–18% reported in other African countries.<sup>5-7</sup> This implies that there has not been any appreciable change in the prevalence of syphilis in Nigeria over this period.

As screening for syphilis in pregnancy has been found to be a cost effective intervention in areas with high or low prevalence rates,<sup>1,7,10</sup> the figure of 2.97% recorded in our study will of necessity qualify us to introduce antenatal screening for syphilis in our hospitals.

Although the rate in this study is indicative of high prevalence, which will necessitate retesting positive RPR cases to confirm syphilis, the low socioeconomic status of most women in our environment will make retesting unaffordable and therefore not feasible. We therefore suggest an initial RPR test at the first antenatal visit, followed by appropriate treatment with a single dose intramuscular injection of 2.4MU benzathine penicillin for all positive cases.

The majority (>90%) of the women in this study registered at first or second trimester of pregnancy, implying that screening and treatment will be effective. However, the most important barrier to routine screening and treatment is cost and this is a result of the high poverty level among the populace.

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SST, a consultant clinical microbiologist, was the principal investigator responsible for the design of the study, performance of serological tests and preparation of the manuscript. YOA was responsible for collection of samples and performance of serological tests. DAA, a consultant obstetrician whose patients were used for this study, was involved in the design of the study and collection of samples.

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