

## Original Research Article

### Incidence of Syphilis among pregnant women attending a tertiary care hospital in Navi Mumbai, India

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#### ABSTRACT

##### Keywords

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Antenatal  
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The incidence of syphilis in pregnant women attending a tertiary care hospital in Navi Mumbai was determined. A prospective study was conducted at MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai from January 2012 - December 2012 on all newly registered Antenatal Care (ANC) patients. Sera from these pregnant women were examined for Syphilis using the RPR test. Two thousand seven hundred and four (2704) pregnant women were included in this study. Women belonged to age group 20-45 years. The incidence of Syphilis was found out to be 0.36% (10 out of 2704 samples) and the maximum positive cases for Syphilis infection were in the age group of 36-40 years; 01 out of 143 (0.69%). Although the incidence of Syphilis in this study was low, it cannot be ruled out that these women, if were untreated, could have resulted in serious sequelae of foetus/newborns. An early diagnosis of Syphilis in antenatal period facilitates proper patient management and initiation of therapy to prevent transmission of congenital infections and anomalies to newborns.

## Introduction

During check-up of pregnant women in antenatal period, apart from obstetric and foetal examination, a number of laboratory tests are done to detect microbial infections which can be transplacentally transmitted to growing foetus and cause congenital infections and congenital anomalies.

Syphilis is a sexually transmitted disease caused by *Treponema pallidum*, a spirochete. It forms a major public health

problem in many parts of the world especially in developed countries (Nakashima *et al.*, 1996). Globally, about 340 million new curable Sexually Transmitted Infections occur each year and out of these infections, syphilis accounts for about 12 million cases, 2 million of them being pregnant women (Singh and Romanowski, 1999). However, these figures represent only a minor part of the problem since a large number of cases go unreported and are

also likely to be either untreated or improperly treated. Prevalence rates are far higher in developing countries where treatment is less accessible. The prevalence of syphilis in pregnant women in some developing countries ranges from 1% to 20% (Brunham and Embree, 1992). In the developing world, the Sexually Transmitted Disease epidemic is characterised by high rate of complications, alarming rate of antibacterial resistance and interaction with HIV infection (Over and Piot, 1991; Buve *et al.*, 1993).

Syphilis is a major cause of reproductive morbidity, mortality and poor pregnancy outcomes in developing countries. Syphilis in pregnant women can result in adverse pregnancy outcomes in about 80% of cases, which includes stillbirth and spontaneous abortion (40%), perinatal death (20%), and serious neonatal infections and low-birthweight babies (20%) (WHO, 2005). Its association with increased risk for HIV infection, Syphilis has also acquired a new strengthening potential for morbidity and mortality (Olokoba *et al.*, 2008).

Because of the serious complicated outcomes of syphilis in pregnancy, WHO has recommended universal antenatal screening. WHO further recommends screening for syphilis at the first antenatal visit, as early as possible in pregnancy, repeating in the third trimester if resources permit, to detect infection acquired during pregnancy (WHO, 2005).

Venereal disease research laboratory test (VDRL) and Rapid plasma reagin (RPR) are the non-treponemal tests for Syphilis detection and are helpful indicators of infection for screening purposes. These are cheaper and easy to perform than treponemal tests.

For the effective management of pregnant females and to reduce the incidence of perinatal transmission of Syphilis, a definitive and early diagnosis is essential. Paucity of such reports from Navi Mumbai necessitated this study.

## **Materials and Methods**

### **Period of study**

January 2012 to December 2012.

### **Place of study**

Samples were obtained from MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai. Tests were carried out at MGM Central Laboratory, MGM Hospital, Kamothe, Navi Mumbai and Microbiology Laboratory, MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai.

### **Specimens**

Serum separated from blood samples obtained from pregnant women.

### **Sample size**

All cases of pregnancy that were registered for antenatal care (ANC) at MGM Maternity and Children hospital, Kalamboli, Navi Mumbai, India from January 2012 to December 2012.

### **Type of study**

Prospective study

### **Study Design**

Only those samples were considered for the study which fulfilled the inclusion criteria-

### **Inclusion criteria**

All pregnant women newly registered for Antenatal Screening (ANC) at MGM Hospital Kalamboli from January 2012 to December 2012 were included in this study.

### **Exclusion criteria**

ANC registered women coming for above tests for second instance were excluded.

### **For Syphilis testing**

Rapid Plasma Reagin (RPR) card test / Carbogen antigen for syphilis testing Tulip Diagnostics Pvt. Ltd. Goa, India). (Lot no.: 674208; Manufacturing date: Jan, 2012; Date of expiry: May, 2013). Mechanical rotor at 180 r.p.m. High intensity light source. Centrifuge machine for separating serum from blood sample. Precision pipette / micropipette.

### **Collection of specimens**

Blood collection was performed using universal safety precaution. 2 ml blood was collected from the pregnant female using standard venipuncture technique. Then blood was transferred in a test tube. The tube with the sample was labeled properly with the name, age and identification number. Blood was allowed to clot naturally and following this serum was separated. If serum specimens were not to be tested immediately, they were refrigerated at 2 - 8°C. For storage for more than 3 days, specimens were frozen at -20°C or below. Repeated freezing and thawing of the specimen were avoided.

### **Test for syphilis**

**Rapid Plasma Reagin (RPR) Card Test** (Tulip Diagnostics Pvt. Ltd. Goa, India). Lot no: 674208; Manufacturing date: Jan, 2012; Date of expiry: May, 2013.

### **Qualitative Method**

One drop (50 µl) of the test specimen, positive and negative controls were pipetted onto separate reaction circles of the disposable slide (provided with kit) using a sample-dispensing pipette. Then one drop of well-mixed CARBOGEN<sup>®</sup> reagent was pipetted next to the test specimen, positive control and negative control by using the reagent dropper provided with the kit.

Care was taken that the dropper tip did not touch the liquid on the slide. By using a mixing stick, the test specimen and the CARBOGEN<sup>®</sup> reagent were mixed thoroughly spreading uniformly over the entire reaction circle. Immediately the slide was placed on a mechanical rotor at 180 r.p.m with timer set for 8 minutes. The slide was observed for any flocculation macroscopically at 8 minutes. If any flocculation was seen then the specimen was further tested using quantitative method.

### **Quantitative Method**

Using isotonic saline serial dilutions of the test sample positive in the qualitative method were prepared (1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128 and so on). The qualitative test procedure using each dilution was prepared as test specimen. The titre was interpreted as the reciprocal of the highest dilution, which showed a positive test result.

Large and Medium black floccules against white background : Reactive. Small black floccules against white background: Weakly Reactive. No floccules, even grey background : Non-reactive.

### **Quantitative Method**

The titre of anti-lipoidal antibodies is the highest dilution of the test sample giving a positive test result.

### **Result and Discussion**

Two thousand seven hundred four (2704) new ANC cases were registered in MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai and all these were subjected for RPR testing. The incidence of Syphilis in this study was 10(0.36%) (Figure 1). The recorded age range was 20-45 years old. Table 1 shows age distribution and Syphilis positive by RPR method.

Syphilis sero-reactivity among pregnant women is highly variable from as low as 0.02% to as high as 12.1% among the world's populations (Lumbiganon *et al.*, 2002).

In the present study the incidence of Syphilis among studied population was only 10 out of 2704 which accounted for 0.36%. According to WHO, the maternal syphilis in India has remained at around 1.5% from 2003 to 2007 (Rattan *et al.*, 1987). Similar findings have been previously reported in India in some research studies like in a research study by Mathai *et al.*, (0.98%) and Sethi *et al.*, (0.84%) in 2001 and 2005 respectively (Mathai *et al.*, 2001; Sethi *et al.*, 2005).

According to a report published by WHO (1996), Syphilis incidence has increased from 5-15 per 100,000 observed in 1990 to as high as 120-170 per 100,000 of population in 1996 (Cates *et al.*, 1996).

In a study conducted in Ethiopia showed seropositivity of Syphilis was 2.9% (12 out of 410) in pregnant women (Kebede *et al.*, 2000). In Nigeria two independent studies were conducted in 2009 which showed that the seropositivity of Syphilis in pregnant women was 0.4% (01 out of 231 pregnant women) and 1.5% (157 out of 10680) in year when screened for Syphilis infection by RPR method (Olokoba *et al.*, 2009; Ibadin *et al.*, 2009).

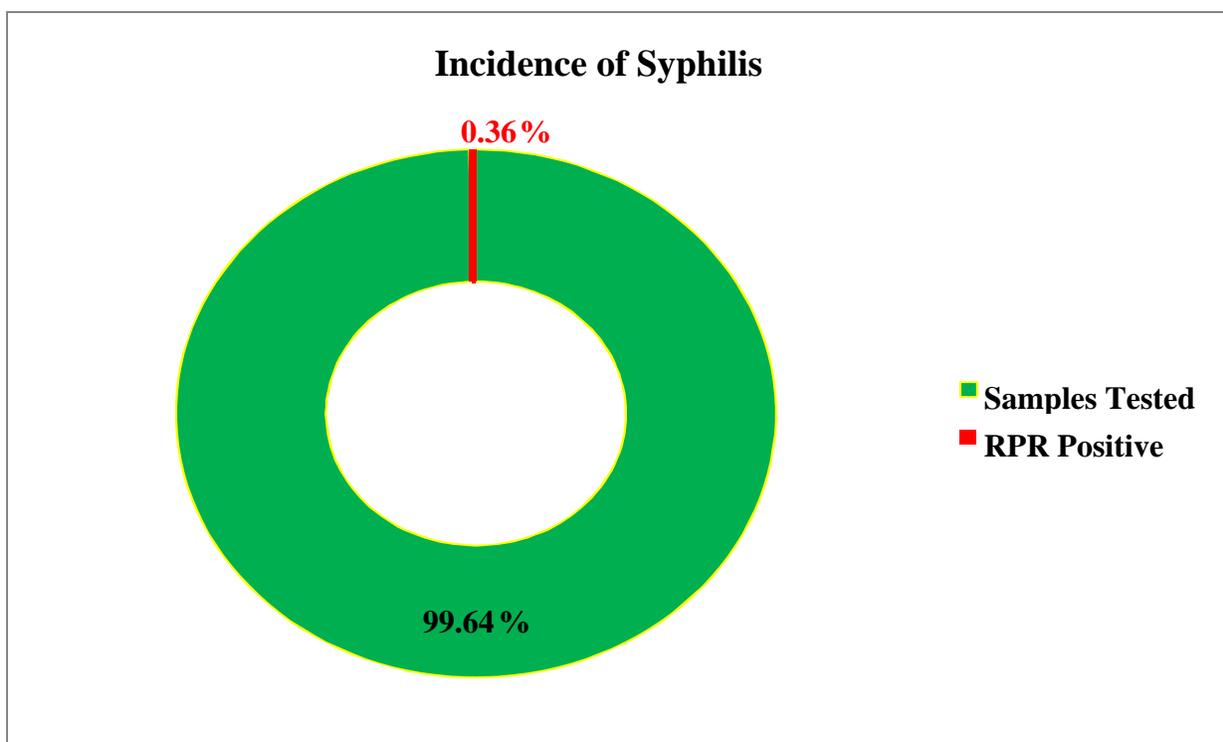
Studies from Saudi Arabia in year 2000 and 2007 have reported a rate of 0.7% and 0.02% of syphilis among prenatal women respectively (Zimmo *et al.*, 2000; Sharifa, 2008). The low incidence rate of syphilis among pregnant women in our study could be either due to greater awareness, improved access to healthcare, effective control programmes and efficacious treatment.

An early diagnosis of Syphilis in antenatal period facilitates proper patient management and initiation of therapy to prevent transmission of congenital infections and anomalies to newborns. Even though the incidence rate of Syphilis in pregnant women recorded in this region is low from this study, it is still advisable for pregnant women to be screened for syphilis because the disease is treatable, and it will help eliminate the adverse effects of untreated Syphilis.

**Table.1** Age distribution and Syphilis positive by RPR method.

Age Group	Total Cases Tested	Syphilis Positive	Syphilis Negative
20-25	1127	05	1122
26-30	923	04	919
31-35	394	00	394
35-40	143	01	142
41-45	117	00	117

**Figure.1** Incidence of Syphilis



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