International Journal of
Reproductive Medicine & Gynecology

Review Article

Appraisal of Syphilis Screening Among Egyptian Women: Is it Really Matter -

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Submitted: 31 October 2017; **Approved:** 16 November 2017; **Published:** 17 November 2017

Cite this article: Abdellatif M. Appraisal of Syphilis Screening Among Egyptian Women: Is it Really Matter. Int J Reprod Med Gynecol. 2017;3(3): 056-059.

ABSTRACT

Objective: To assess the global prevalence of syphilis among pregnant Egyptian women and the potential usefulness of universal antenatal screening among Egyptian attendees to convene a set of recommendations for clinical practice according to the Egyptian situation.

Patients and Methods: It is a population based cross sectional serological study on 12.805 pregnant women attended to Ain Shams University Maternity Hospital both antenatal and emergency obstetric units over a 5-year period (from January 2010 till December 2014). Women were assessed by Rapid Plasma Regain (RPR) and FTA-Abs tests done on serum derived from blood samples gathered by vein puncture.

Syphilis is caused by a spirochete called Treponema pallidum, which is a Sexually Transmitted Disease (STD) highly infectious in its early stages. It also passes trans-placentally from the 9th week of gestation onwards [1]. The main pathology of the disease is vasculitis [2]. Untreated maternal infection is usually responsible for adverse fetal and neonatal outcomes which comprise an elevated incidence of abortions, stillbirths, intrauterine growth restriction and preterm births compared with uninfected women [3]. Congenital syphilis syndrome includes perinatal death in 40% of infected pregnancies, deafness, multiple skin, bone, and joint abnormalities; and haematological disorders [4]. A study in the Mwanza region of Tanzania [5], had reported that 49% of women who had high-titer active syphilis (defined as a Rapid Plasma Reagin (RPR) titer 1:8 and a positive Treponema Pallidum Hemagglutination Assay (TPHA) or fluorescent Treponemal Antibody (FTA) test result), had adverse pregnancy outcomes, compared with 11% of seronegative women. Screening and treatment of syphilis in pregnant women is important in areas with high prevalence of infection and has been advised as a potentially cost-effective and feasible intervention [6-9].

Results: The global rate of positive cases by RPR was 0.35% (45 cases). Of these 45 cases 4 cases were found to be FTA-Abs positives. Moreover, the screening programme found no case of vertical transmission of the diagnosed mothers.

Conclusion: This update confirmed that the evidence of benefits of antenatal screening programme for syphilis was weak as the rate of infection is too low to consider population based screening acceptable. So routine screening for syphilis should no longer be recommended among pregnant Egyptian women; however clinicians may offer screening to selected women depending on individual circumstances.

Keywords: Syphilis; screening

INTRODUCTION

Syphilis is caused by a spirochete called Treponema pallidum, which is a Sexually Transmitted Disease (STD) highly infectious in its early stages. It also passes trans-placentally from the 9th week of gestation onwards (1). The main pathology of the disease is vasculitis [2]. Untreated maternal infection is usually responsible for adverse fetal and neonatal outcomes which comprise an elevated incidence of abortions, stillbirths, intrauterine growth restriction and preterm births compared with uninfected women [3]. Congenital syphilis syndrome includes perinatal death in 40% of infected pregnancies, deafness, multiple skin, bone, and joint abnormalities; and haematological disorders [4]. A study in the Mwanza region of Tanzania [5], had reported that 49% of women who had high-titer active syphilis (defined as a rapid plasma reagin (RPR) titer 1:8 and a positive Treponema Pallidum Hemagglutination Assay (TPHA) or Fluorescent Treponemal Antibody (FTA) test result), had adverse pregnancy outcomes, compared with 11% of seronegative women. Screening and treatment of syphilis in pregnant women is important in areas with high prevalence of infection and has been advised as a potentially cost-effective and feasible intervention [6-9]. The World Health Organization (WHO) recommended screening for syphilis in pregnancy and treatment with injectable penicillin, the partner must be treated as well, as a routine part of antenatal visits [10]. Ideally, the serological screening should be done during the first trimester and repeated again early in the third trimester, even in low- prevalence populations. There is observational evidence that suggests that the universal screening of pregnant women decreases the proportion of infants with clinical manifestations of syphilis infection and those with positive serologies5. Indeed, the benefits of screening all pregnant women for syphilis infection substantially outweigh potential harms [11]. Some workers have however advised a reappraisal of the practice of universal antenatal screening for syphilis having demonstrated low sero-prevalence in their antenatal population. They questioned the cost-effectiveness of this practice given its low yield [12]. Guidelines for the treatment of maternal infection recommend a single Intramuscular (im) dose of 2.4 Million Units (MU) of benzathine penicillin for the treatment of primary, secondary, and early latent syphilis and 3 doses of benzathine penicillin for late latent syphilis or syphilis of unknown duration [13]. In this study, we set out to update previously published estimates of the global numbers of women infected by syphilis and assess the potential usefulness of universal antenatal screening among Egyptian attendees to convene a set of recommendations for clinical practice according to the Egyptian situation.

PATIENTS AND METHODS

It is a serological cross sectional study performed at Ain Shams University Maternity Hospital, a central tertiary referral hospital in Cairo, Egypt. 12.805 Egyptian pregnant women were recruited over a 5-year period (January 2010 - December 2014), the case record of every pregnant woman presenting for their first antenatal clinic visit was reviewed. A written informed consent was obtained from all patients before participation. Data was collected by the means of a prepared proforma. These data included selected demographic and obstetrics information. Information on the result for screening for syphilis was also extracted. Women with incomplete data were excluded from the study.

LABORATORY DIAGNOSIS OF SYPHILIS

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°C until tested. All serum samples, test antigens and control samples were brought to room temperature (26°C) and tested by Rapid Plasma Regain (RPR) and FTA-Abs tests (Biocan Diagnostics Inc., Chino, Canada). Ethical approval to publish the results of this study was obtained from the ethics committee of ASUMH.

RESULTS

From January 2010 to December 31st 2014, 12.805 pregnant

women attended antenatal care, at Ain Shams University Maternity Hospital, Cairo, Egypt. The records of the women were subsequently reviewed for the sero-prevalence of syphilis. The mean age of the women was 27.4 years (± 5.34) and they presented at a mean gestational age of 26.4 weeks (± 6.36). Most of the patients were in the age group 20 to 34 years. The modal parity was 0.4. Slightly over half of the patients were in their second trimester of pregnancy. Only 45 patients were found to be reactive for syphilis giving a prevalence of 0.35% and only 4 cases were confirmed to have syphilis by FTA-Abs tests (31.2 per 100.000).

DISCUSSION

The current cross sectional study was carried out to estimate the infection rates of syphilis among Egyptian pregnant women and the need to follow the general guidelines of universal screening for the infection in the first antenatal visit. 12.805 pregnant women, who attended obstetric units, were tested over a 5-year period (from January 2010 till December 2014) at a tertiary maternity hospital, Ain Shams University Maternity Hospital. The study found that the sero-prevalence during pregnancy for syphilis was 0.35% and only 4 cases were confirmed to have syphilis by FTA-Abs tests (31.2 per 100.000). Interestingly, the reported incidence was higher than some other countries, the reported incidence rate of primary and secondary cases of syphilis infection in United States was 2.4 per 100,000 persons, and the prevalence of congenital syphilis in United States was 11.1 per 100,000 live births [14]. The rate of syphilis infection differed by area (3.1 and 1.7 per 100,000 cases for the South and Northeast U.S., respectively) and by ethnicity (9.8, 2.7, and 1.2 per 100,000 persons for African Americans, Hispanics, and whites, respectively) [14]. In United States, commercial sex workers and persons have a higher incidence of syphilis infection [15,16]. Congenital syphilis infection resulted in perinatal mortalities in 40 percent of affected pregnancies, [17] as well as multiple disabilities in surviving newborns, mainly central nervous system deficits; sensori-neural hearing loss; skin, skeletal deformities; and hematological disorders [18].

The efficacy of syphilis screening was examined in limiting syphilis-related disabilities in the community, as well as in high-risk groups and in pregnant women [19]. It was found that there was no sufficient evidence that screening for syphilis infection in the general population or in high-risk droups reduces morbidity or mortality [20,21].

Traditionally, 2-step process is needed for screening of syphilis infection that comprises an initial nontreponemal test (VDRL or RPR) then a confirmatory treponemal test (FTA-ABS or TP-PA). Sensitivity of the screening tests are estimated to be 78-86 and 100 percent for detecting primary and secondary syphilis infection respectively, and 95-98 percent for detecting latent syphilis infection. Specificity ranges from 85-99 percent and may be less in persons who have preexisting conditions (i.e., tuberculosis, malaria, and viral and rickettsial diseases, collagen disease, pregnancy, intravenous drug use, advanced malignancy) that produce false-positive results [22]. New screening tests currently being studied for use in pregnant women and infants include: IgM immunoassay and Polymerase Chain Reaction (PCR) assay of serum and cerebrospinal fluid for cerebral infection in infants, placental examination, and umbilical cord blood testing [19].

No studies have studied the hazards of screening or treatment. Potential hazards of screening may include potential costs to the doctor and patient (time, resources, etc.) and false-positive results that lead to stress, labeling, and further work-up. Hazards of treatment include drug-related side effects including anaphylaxis from penicillin and the Jarisch-Herxheimer reaction (headache, myalgia, fever and other symptoms) that may occur within the first 24 hours after any therapy for syphilis.

Seven studies done in different regions support continued universal screening during pregnancy [18]. In a study done in the UK, universal screening of pregnant women was about as cost-effective as targeted screening programs [23]. The sero-positivity on screening of 0.35% found in this study is quite low. Other workers in other developing countries have reported progressively lower values on screening. Oyelese et al, in 1990 reported 2.3% [24], Adewole et al, in 1997 reported 1.55% [25] while Obisesan, et al. in 1999 reported 1.1% [26]. As a result of these, Obisesan et al in 1999 [26] reported that screening for syphilis was no longer cost effective and advised that the practice be discouraged. However, Taiwo et al more recently reported a rate of 9.9% and strongly recommended that the practice continue [27]. Watson-Jones et al working in Tanzania also reported wide variations in the results reported at various regions and attributed these to basic misunderstandings about the testing techniques among the health providers and a need of concerted actions for quality assurance programs [28]. It may thus be premature to abandon the practice of universal screening for syphilis among Egyptian pregnant women without conclusively confirming these low rates in different obstetric populations nationwide, using more sensitive tests. This is because of the serious handicaps of the morbidities resulted from undiagnosed maternal syphilis. Indeed, it is vital to understand that syphilis is capable of re-emerging in community extremely fast when prevention measures wane or collapse [29,30]. This is another issue to strongly encourage the antenatal screening for syphilis. In conclusion, the seroprevalence of syphilis among Egyptian pregnant women was quite low and the call to discontinue the routine antenatal screening was justified. But, a more concerted screening program using higher sensitivity screening procedures is necessary before totally jettisoning this traditional aspect of antenatal care.

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