

The Prevalence of Anti-Syphilis Antibody in Iranian Pregnant Women

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Abstract

Objective: The present study aimed to determine the prevalence of anti-syphilis antibodies in Iranian pregnant women who attended antenatal care (ANC) in 21 districts affiliated to Isfahan University of Medical Sciences (MUI) from April 2017 to April 2020.

Materials and methods: In a cross-sectional study in 2020, the data about anti syphilis antibody were collected from electronic health files of pregnant women. Pregnancy specific health package was delivered to Iranian pregnant women in a horizontally integrated network across the country. The electronic health file was used for every Iranian citizen and all health events were recorded by their health care providers in 2016. All health services, particularly laboratory tests that were performed either in public or private laboratories, that were given to pregnant women needed to be recorded in their electronic health files. According to the pregnancy health package, they were screened initially by Rapid Plasma Reagin (RPR) test.

Results: In those years, 70512, 72298, 63272 pregnant women were screened respectively. In these intervals, using the RPR test, no positive cases of anti- syphilis antibody were found.

Conclusion: It seems that syphilis infection among Iranian pregnant women who attended ANC in districts affiliated to MUI has reached the elimination phase.

Keywords: Prenatal Care; Sexually Transmitted Diseases; Syphilis; Pregnancy

Introduction

Syphilis is a sexually transmitted disease (STD) caused by the *Treponema pallidum* bacterium. Two of the key health targets of the Sustainable Development Goals identified by the World Health Organization (WHO) in 2030 are a 90% reduction of *T. pallidum* incidence globally (2018 global baseline), and 50 or fewer cases of congenital syphilis

per 100 000 live births in 80% of countries (1).

The Global Strategy identified achieving main STD control programs for health surveillance systems as 70% of countries have operated STD surveillance systems, and for health service utilization as 70% of countries have screened pregnant women for syphilis more than 95%, by 2020. It is recommended that all pregnant women should be tested for syphilis as early as possible when they first visit to receive prenatal care. For women at high risk, the test should be repeated at 28-32 weeks of gestation and delivery (2).

Based on health care package which is considered

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for pregnant women and is delivered by the office of Family and Reproductive Health of Iranian Ministry of Health and Medical Education (MoHME), and regarding syphilis infection and syphilis antibody, every pregnant woman was screened freely in all regions, either rural or urban areas, in the first trimester rather in 6 to 10 weeks of pregnancy (3).

In recent years, particularly following the launch of health sector reform as introduced in universal health coverage in 2 phases, more than 95% of Iranian citizens have been covered by governmental health insurance thanks to receiving primary health care. Primary health services in Iran were delivered through a more developed network that is integrated horizontally in all regions. Besides, health services were offered to each client based on specific owner packages according to age groups and specific conditions such as the perinatal period. Also, in public health centers, antenatal health services were delivered to pregnant women free of charge (4-5). In addition, every pregnant woman had received at least 8 antenatal care (ANC) (6).

The aim of the present study was to evaluate the frequency of positive screening tests for anti-syphilis antibody among pregnant women in districts affiliated to Isfahan University of Medical Sciences (MUI) in the last three years.

Materials and methods

This study was a descriptive cross-sectional study that was done in 2020. All electronic health files of pregnant women between April 2017 and April 2020 were evaluated through the census sampling method. The present study was done according to the agreement of MUI's ethics committee no. IR.MUI.REC.1398.111.

Since many pregnant women have received private services, the data in public laboratories are not convincing. Moreover, the laboratories in the private sector did not tend to cooperate in this study as they keep their patients' data confidential. So, data gathering process was performed through the assessment of each citizen's electronic health file. All pregnant women who have stayed in 21 districts of Isfahan Province and are affiliated with MUI between 2017 -2020, except for Kashan and Aran & Bidgol districts, screened by RPR test for anti-syphilis antibody which has the sensitivity and specificity as 92.7% and 98(93-99) % respectively (7).

The health package for pregnant women was integrated horizontally in Iranian health delivery system network. The methods of the surveillance

system in Iranian health delivery system are based on universal health care and this surveillance system covered the entire facility-based population. The methods for collecting STD data were screened for syphilis in all pregnant women who attended ANC and also for HIV, hepatitis B, and gonorrhea in high risk pregnant women (3).

Data quality includes completeness as well as the efficiency of the screening and diagnostic tests, the supervision of persons who complete surveillance forms and sending feedback to executive personnel which was carried out properly. It is mentioned that the data were maintained confidentially in all levels from the local to the central offices (4, 8).

Results

According to the data gathered from the study in 2017, 2018, and 2019, a totally 70512, 72298 and 63272 pregnant women were screened respectively in terms of anti-syphilis antibody through conducting RPR test in 21 towns affiliated to MUI. These data which are based on laboratory reports from public and/or private sectors indicate that there were no positive cases of anti-syphilis antibody in those three years.

Discussion

The result of the present study showed no positive cases of anti-syphilis antibody in pregnant women. According to WHO's report in 2017 and the latest statistics in Iran in 2010, 96.9% of Iranian pregnant women got at least one appointment of health care service during perinatal periods. In the Meantime, 70% were screened for syphilis and no positive cases of syphilis were reported. Besides, the rate of congenital syphilis was as likely as 0% per 100,000 live birth in 2011 (9).

Similarly, in a previous study that was done on incarcerated women in the central prison in Isfahan, no positive RPR test was detected (10). Based on another research in Iran that was done on 2151136 samples of blood donor cases, the prevalence of syphilis infection reduced from 0.03% to less than 0.01% during 2008-2009 (11). In other studies which were done to investigate epidemiology of syphilis among pregnant women (12) and evaluating the prevalence of syphilis co-infection in HIV positive persons in Shiraz city in Iran, no positive definite cases of syphilis were reported (13).

As far as it goes, the results of this study show that the prevalence rate of syphilis infection among pregnant women in Isfahan province was similar to

the other provinces of the country. Likewise, in a similar study in Turkey between 2007 -2014, among 63276 pregnant women, syphilis prevalence was 0.0648% and no congenital syphilis was reported during this period (14).

Incongruent with the present study's results, the prevalence of syphilis is not clear among American pregnant women. However, the prevalence of congenital syphilis reached 23.3 per 100 000 live births in American pregnant women (15) and 1.86 per 100 000 live births in Canada in 2017 (16). In addition, the prevalence rate of syphilis among the pregnant women was reported as 4.4% in Brazil (17), and 2.9 per 1000 pregnant women in Hungary (18).

Based on the fact that WHO emphasized the 90% reduction in *T. pallidum* incidence globally in 2030, so far at least 11 countries and territories, such as Cuba, Thailand, Belarus, and Malaysia, have eliminated mother-to-child transmission (MTCT) of syphilis (9). The government's commitment to eliminate MTCT and well-organized primary health delivery system to present comprehensive health care, particularly health promotion package to correct reproductive and sexual behavior, can play major roles in eliminating MTCT of syphilis.

It is of significance to pay attention to the existence of false negative results in the non-Treponema tests, which were seen in patients with early syphilis who could not produce antibodies in early stages of the disease and prozone reaction which is commonly associated with pregnancy (1). However, the last WHO's report on zero incidence rate of congenital syphilis in Iran supports our finding (9). However supplementary research on suspected newborns and infants from TORCH (Toxoplasmosis, Rubella, Cytomegalovirus, Herpes Simplex, and other organisms including Syphilis, Parvovirus, and Varicella Zoster) syndrome can rule out congenital syphilis in the future and can confirm our findings.

Conclusion

This study showed that the prevalence rate of anti-syphilis antibody in pregnant women in districts affiliated to MUI between 2017 and 2020 reached zero and this disease was eliminated in districts affiliated to MUI.

Conflict of Interests

Authors have no conflict of interests.

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