International Journal of Advanced Biotechnology and Research (IJBR)
ISSN 0976-2612, Online ISSN 2278–599X,
Vol-8, Issue-4, 2017, pp1177-1183
http://www.bipublication.com

Research Article

Investigating the Prevalence of Positive VDRL in Pregnant Women in Jahrom Town: A retrospective descriptive, cross-sectional study

Vahid Mogharab[1] and Farideh Mogharab[2*]

[1]Department of Pediatrics, Jahrom University of Medical Sciences, Jahrom, Iran
[2]Research Center, Department of Obstetrics and Gynecology,
Jahrom University of Medical Sciences, Jahrom, Iran.

Corresponding Author: Farideh Mogharab. Research Center, Department of Obstetrics and Gynecology, Jahrom University of Medical Sciences, Jahrom, Iran. Tel: +989171913526. E-mail: mogharabfarideh@yahoo.com

ABSTRACT

Introduction: Syphilis is an infectious disease caused by pallidum Treponema. It is a sexually transmitted disease but can also be transmitted through bloodand from the mother to the fetus. The newborn child will suffer from various syndromes due to multiple organ dysfunction in case that untreated mother has transmitted the disease to the fetus. The VDRL test is a routine screening tool for detection of syphilis during pregnancy in Iran. The necessity of VDRL test was assessed in Jahrom Town given the Islamic society, social status and treatment costs in this region.

Method: This was a retrospective, descriptive, cross-sectional study. The prevalence of syphilis was determined by studying 790 pregnant women covered by urban health centers in Jahrom Town from April 2011 to April 2012. For this purpose,the efficacy of VDRL test as a routine pregnancy test was assessed. The efficacy of HBS, HIV, HCV, Ab and Ag tests (these tests are not performed routinely during pregnancy and are only selectively performed in some cases) and other comorbiditiessuch as urinary tract infection, other sexually transmitted infections, age and education of the mother, spouses' job and religion were simultaneously assessed as factor risk factors.

Results: The VDRL test was not positive in any case and 100% of the women were Muslim. Half of the samples had higher than diploma degree. The prevalence of hepatitis B was 0.2% and the incidence of hepatitis C and HIV was zero. No other sexually transmitted disease was detected in studied pregnant women.

Conclusion: since no positive VDRL test result was reported, it is recommended that similar studies be carried out in other regions in Iran in order to allocate the cost of this test to other important tests for diagnosis of more common diseases.

Keywords: VDRL test, syphilis, pregnancy

INTRODUCTION

Syphilis is a chronic, systemic disease caused by Treponema pallidum subspecies pallidum. It is usually a sexually transmitted disease. In some cases, the disease is transmitted through blood transfusions or from mother to the child. Syphilis is characterized byepisodes of active disease (primary, secondary, tertiary stages) interrupted by periods of latency (latent syphilis). The latency period varies from two to six weeks. Primary lesions appear after the first latency period often associated with lymphadenopathy. The secondary bacterial stage is characterized by generalizedcutaneous-mucosal lesions and generalized lymphadenopathy. Then,one-week latency occurs that induces subclinical infection and

may last several years. Tertiary syphilis develops in a subset of untreated syphilis infection characterized by progressive destructive parenchymal, musculoskeletal and cutaneous-mucosal lesions, aortic andsymptomatic disease of the central nervous system (1). Syphilis can seriously affect pregnancy and its outcome. Syphilis complications include spontaneous abortion, still birth, non-immune hydrops, intrauterine growth restriction, fetal death and serious complications in infected newborn children. Nevertheless, this disease is not common in Iranian society, especially in women's medicine. Timely diagnosis and proper treatment of the pregnant woman can prevent such complications (2). The Venereal Disease Research Laboratory test (VDRL) is a nontreponemal, simple, inexpensive diagnostic method forearly diagnosis and treatment of syphilis in pregnant women and suspiciousindividuals. Unfortunately, this test was found to be false negative in 25-30% of earlystages of late and latent syphilis. The test results was false positive in many cases including pregnancy, autoimmune diseases, addiction and infections. The test result is 100% positive only in the second stage of the disease. Therefore, it is not a valid primitive test in early, latent and late syphilis. Such specific diagnostic tests as flurence-treponemal absorption test (FTA-ABS), trepoemal pallidomassay for antibodies to T pallidom (TPH -TP) are required to detect early, late and latent syphilis (3). Assessment of syphilis during the first three months of pregnancy with such tests as RPR and VDRL and confirmation of positive cases with such tests as FTA-ABS are economical strategies for detection of syphilis. Those individuals at the risk of syphilis should be retested in the last three months of pregnancy (2). The VDRL test should be repeated at the 28^{th} week of pregnancy in the areas with a high risk of syphilis and different and abnormal sexual behaviors and in people with AIDS and other sexually transmitted diseases. Since the VDRL test is a routine measure in prenatal care in Iranian Islamic society, the probability of unethical and abnormal behaviors is lower than other countries. The number of AIDS cases and intravenous drug users is lower in Iran thanthe Western societies. Therefore, the present study aimed to determine the prevalence of syphilis in Jahrom Town and the necessity ofroutine VDRL test during pregnancy in this region, so that other diagnostic tests for more common diseases(e.g. hepatitis C) can be replaced with the VDRL test. The results of this study can be used in future studies in order to assess bothroutine and uncommon tests during pregnancyto determine whetherthe VDRL test (as a routine test during pregnancy) is economical and valid in Jahrom Town with regard to prevalence of syphilis in this region and regardless of risk factors.

METHOD

This was a retrospective, descriptive, cross-sectionalstudy. Necessary arrangements were madein the health center to carry out the project in Jahrom Town. All urban health centers in Jahrom Town (7^{th} Urban Health Center) were visited to collect the records of all pregnant women visiting urban health centers (n = 790) from April 2011 to April 2012. Theprevalence of syphilis was determined based on the VDRL testroutinely carried out in all pregnant women. HBS-Ag, HI, Anti HCV and Ab tests(performed selectively in some patients) and urinalysis were simultaneously performed. The prevalence of other infectious diseases such as sexually transmitted diseases (if reported in the records) and autoimmune diseases (e.g. RA, SLE and antiphospholipid syndrome) was also assessed in the studied population. Required statistical data wascollected for interpreting the prevalence of syphilis during pregnancy in Jahrom Town. Such risk factors as age and education of pregnant women and the number of pregnancies and job of the spouses were also assessed to determine the prevalence of syphilis. The statistical population consisted of the pregnant women visiting the urban health centers in Jahrom Town. The VDRL test as a serological and nontreponemal tool was carried out in a routine manner in all women under the coverage of prenatal care in order to determine the prevalence of syphilis during pregnancy. Since syphilis is mostly a sexually transmitted disease,

the prevalence of HIV, HIV, hepatitis C andhepatitis B (mainly sexually transmitted diseases)were simultaneously assessed. The incidence of other infectious diseases and autoimmune diseases in the records were also assessed in order to eliminate possible false positive test results.

Those cases with addiction and unconventional sexual relationships were excluded from the study since their records were not available. The EXCEL was used to draw the charts.

In this study, 790 records of pregnant women under the coverage of prenatal care visiting the health center in Jahrom Town from April 2011 to April 2012 were investigated. All women underwent the VDRL test. No positive test result was found in the 790 records. Of 790 cases, 445 patients were between 15 and 25 years old(56.33%), 321 patients were from 26 to 35 years old(44.64%) and 24 patients were above 36 (3.03%).

The frequency and percent of the patients by age are shown inchart 1 and Table 1.

RESULTS

Table 1: frequency and percent of pregnant women by age

frequency and percent of pregnant women by age					
15-25		26-35		> 35	
Frequency	Percent	Frequency	Percent	Frequency	Percent
445	56.33%	321	40.64%	24	3.03%

Of 790 patients, 457 were gravida I(57.84%), 296 were gravida II and II(37.46%) and 37 were greater than gravida III (4.84%). The frequency and percent of the patients by gravida are shown in chart 2 and Table 2.

Table 2 :frequency and percent of gravida in pregnant women

frequency and percent of gravida in pregnant women					
Gravida I		Gravida II and III		>gravida III	
Frequency	Percent	Frequency	Percent	Frequency	Percent
457	57.84%	296	37.46%	37	4.68%

Of 790 patients, 414 had less than diploma degree (52.42%), 291 had diploma degreeand higher than that (36.49%) and 85(64.10%) had a bachelor degree and higher than that.

Frequency and percent of education of the patients are shown in Table 3.

Table 3 :frequency and percentage of education in pregnant women

frequency and percentage of education in pregnant women					
Less than diploma degree		Diploma and higher than that		Bachelor and higher than that	
Frequency	Percent	Frequency	Percent	Frequency	Percent
414	52.42%	291	36.94%	85	10.64%

Of 790 cases, 555 (70.25%) were employed in the private sector in Jahrom Town (e.g. shopkeeper, worker, broker, mechanic) and 184 were employed in the public sector (e.g. employee, military, secretary) and 51(45.6%) were drivers.

Frequency and percent of spouses' jobs are shown in table 4.

Table 4 :Frequency and percent of spouses' jobs

Frequency and percent of spouses' jobs					
Private		Driver		Public	
Frequency	Percent	Frequency	Percent	Frequency	Percent
555	70.25%	51	6.45%	184	24.30%

Laboratory findings

1- No positive VDRL test result was found. In other words, the prevalence of syphilis was zero in Jahrom Town in 2004.
2- On positive cases of HBS-Ag was detected in 242 tested cases(0.2%).
3- The frequency of anti-HCV antibody–positive was zero in 41 tested cases.

4- The frequency of HIV-positive was zero in 12 tested cases.

Comorbidities

1- Frequency of urinary tract infection was 10.4%(n = 82).
2- No autoimmune and other sexually transmitted diseases were reported in pregnant women.

The frequency and percent of the above cases are shown in Figures 5-8 and Table 5.

Table 5 : Frequency distribution of laboratory tests in pregnancy

Studied disease	The test	Frequency of positive case	Percent of positive cases	The studied population
Syphilis	VDRL	0	0%	790
Hepatitis B	HBS Antigen	1	0.02%	424
Hepatitis C	Anti HCV antibody	0	0%	41
AIDS	HIV antibody	0	0%	12
Urinary tract infection	Urine analysis	82	10.4%	790
Autoimmune diseases	-----	0	0%	790

DISCUSSION

The results of this study were compared with the results of other studies in other countries. This was a retrospective, cross-sectional study. The records of 790 pregnant women under prenatal carevisiting the urban health centers in Jahrom Town were studied. The prevalence of syphilis was very low in the studied pregnant women.

The prevalence of syphilis during pregnancy was determined based on the VDRL test. It is a simple, inexpensive tool with high specificity (99.5-100% specificity in healthy individuals and 85.75% specificity in the patients with syphilis). Test sensitivity is 100%. The prevalence of syphilis in the pregnant women visiting the health centers in Jahrom Town was zero based on the VDRL test results. These results are interpreted in the below. Residents of this town are religious and adhere totheir religious principles. One hundred percent of the residents are Shiite and adhere to their religious beliefs (one hundred percent had formal marriages). High prevalence of syphilis is reported in those societies with illegitimate sexual relationship and pregnancy without formal marriage. The prevalence of other sexually transmitted infections was studied simultaneously with syphilis. The prevalence of the afore-mentioned diseases, hepatitis B, hepatitis C and HIV was 0%. The prevalence of syphilis was also zero in this population. The prevalence of HIV and other sexually transmitted diseases was high in those areas where syphilis was prevalent. More than half of the studied pregnant women were gravida I and half them had higher than diploma degree. These parameters indicate an increased awareness of the people and the potential to participate in pregnancy training sessions. On the other hand, the pregnant women were not covered by prenatal care in those areas where syphilis was prevalent. In some cases, they were even informed of their diseasewith congenital syphilis diagnostic method. Education of the mother was very low in these areas. Spouses' jobs was introduced as a risk factor in this studyto identify those pregnant women whose spouses were traveling between cities(6.45%) but the prevalence of syphilis in this group was also zero. A review of literature gives more insight for understanding this issue. Batool Sharifi and Maliheh Metanat(2002) studied 19450 pregnant women using the VDRL test and follow-up of positive cases in urban health centers in Sistan and Baluchestan Province.Six positive VDRL test results(3.08%) was found in the former study.However, syphilis was not confirmed in complementary assessments, which indicated that all the cases were false positive. Since 3.08% of the case were positive in the VDRL test and syphilis disease was not detect in the follow-up, it was recommended to conduct similar studies in other parts of the country to achieve promising results and allocate the cost of the VDRL test to other important tests for diagnosis of more common diseases. The former study is very similar to this study in Jahrom Town with the exception that no positive VDRL test result was reported in 790 pregnant women in the present study (4).Tara *et al.*reported the prevalence of syphilis

(positive VDRL test result) as 3% in every 100000 people in Mashhad in Khorasan Province in 2000-2001. The prevalence of syphilis was also low in this study. However, prenatal care services were not available to public people although many pregnant people were covered by the health centersin the former study (5). In the former study, 19.6% of the studied population were tested for syphilis and 64% were under prenatal care since the third month of pregnancy. This shows proper planning and schedule of health care service providers. Malaria prevention measures should also be taken in Mashhad due to high prevalence of this disease in this region.As a result, more common diseases than syphilis should be assessed in this region. Piaggio and Lumbiganon*et al.* performed a similar study in four different countries in 2001-2002.Such tests as VDRL and RPR were carried out in the first examination of pregnant women who were covered by prenatal care. These tests were repeated after delivery. The prevalence of syphilis varied from 0.6% to 0.9% between pregnancy period and postpartum period. Low age of the mother was a risk factor for syphilis during pregnancyin the former study. TheVDRL test was also reported costly in the former study (6). The results of the former study were consistent with the results of this study. Van Eijk*et al.* studied pregnant women in a village in Kenya. The results were announced in April 2006. The former study aimed to determine whether proper prenatal care services were given to pregnant women. Of 635 pregnant women, 90% visited health centers for prenatal care. Their average visit was 4 times during pregnancy. The first visit of most women (64%) was at the beginning of the third month of pregnancy. Those women who did not seek prenatal care had low education (less than eight-year education) and poor socioeconomic status. Prenatal care services in these health centers included abdominal examination, tetanus vaccination and weight measurement. More than 90% of the studied population received these services. However, iron supplements were only given to 53% of the cases and folate supplement to 44% of cases, syphilis test was carried out in 19.4% of the cases and malaria preventive measures were taken in in 21% of the cases. Higher age of the mother led to still birth in previous pregnancies in the former study. It was recommended to carry out a second syphilis screening test in the third month of pregnancy in the areas where syphilis is less prevalent (7). Risk factors of the former study differed from this study (e.g. a history of still birth in previous pregnancies due to syphilis).Amaral*et al.*studied pregnant women in Campinas Hospital in 1996-1998. Newborns' cord blood samples were tested for HIV and syphilis in 5815 pregnant women who were divided into two groups. The firstgroup were under private care and the second group under academic care. The cost of prenatal care services varied in these two groups. Such factors as occupation, age of marriage and education were also investigated in the former study. The result of the formershowed the prevalence of HIV as 0.45%, syphilis as 1.6% and both HIV and syphilis as 0.02%. The prevalence of these diseases were higher in those women under private care than those under academic care. This can be attributed to lower economic situation and education in the studied population (8). The prevalence of syphilis was 16.1% in the former study and 0% in this study. This is because all women in this study received similar and proper prenatal care services. In addition, the prevalence of HIV was zero and the prevalence of other sexually transmitted diseases was low in this study while the prevalence of HIV was 42% in the former study. The similarity of the former study and this study was lower prevalence of the disease in more informed population[1].Aziz. Fatahun *et al.* studied 270 pregnant women in a rural hospital in northwestern Ethiopia in 1993-1995. Mean age of these women was 25.2. Of these, 97.4 were Orthodox Christians and 58.2% had formal marriage. Meanwhile, only 4.7% received prenatal care services from the third month of pregnancy. The result of the former study showed the prevalence of syphilis as 13.7% based on positive VDRL test results.

Most of these women had a history of sexually transmitted diseases along with positive VDRL test result. The most important risk factor of the former study was a history of sexuallytransmitted infection (9). This study had two important risk factors that increased the prevalence of syphilis to 13.7% in the pregnant women. Formal marriage was only reported in 58.2% of the population. Most of these women a history of sexually transmitted infection. The prevalence of syphilis was very low in the present study compared to the former study for two reasons.

1-2- One hundred percent of pregnant women in Jahrom Town were married officially.

2-2- The incidence of other sexually transmitted diseases in this town was very low.

Ram, Cronje *et al.* studied 1508 pregnant women in Pelonomi Hospital in 1993-1995. The RPR test was used for detection of syphilis. Positive RPRtest results were followed by VDRL and TPHA. Cord blood samples were taken from newborn babies and analyzed by ELIZA, IgG and IgM tests. Only 1479 mothers and 1399 newborn children visited the obstetric clinic during pregnancy. Of these, 17% had a positive test results and only 22% revisited the clinic for treatment. Fifteen percent of the positive cases had not visited the clinic during pregnancy and 8% of the newborns had positive PRP tests results. The result of the former study showed that high prevalence of syphilis (>15%) is attributed to inadequate prenatal care and treatment of diagnosed cases during pregnancy (10). However, proper screening for syphilis during pregnancy, follow up and treatment of positive VDRL cases by urban health center contributed to low prevalence of syphilis in this study (this was confirmed by authorities of Infectious Disease Center).

G. Yaneshwar, N. Sanze*et al.* studied 440 pregnant women in SUVA. Of these, 257 were Fijians and 183 were Indians. The serologic syphilis test result was positive in 50% of the Fijians and 38% of the Indians. Neisseria gonorrhea test was positive in 37% of the Fijians and 1.1% of the Indians. More pathogens were transmitted through the Fijians than the Indians. This can be attributed to lower mean age (22 vs. 26), more unmarried cases and uncontrolled sex in the Fijians compared to Indians (11). Mean age of the studied women was 15-25(56.33% of the cases) in this study. Such risk factor as infection with Chlamydia and Neisseria was not also reported in this study and all pregnant women were married. For these reasons, the prevalence of syphilis was low in this study compared to the former study. Ochakdebela, Pc. Gini studied 29083 pregnant women in a teaching Hospital in Nigeria in 1979-1984. The women were screened for syphilis by VDRL test and positive cases were retested with the TPHA test. Of these, 890 were positive for VDRL and 103 were positive for TPHA. Only 0.35% of 11.6% of cases of positive VDRL had syphilis. Higher prevalence of the disease was reported in those women with unorthodox sexual relationship with other partners than their husbands on in those women whose spouses had sexual relationships with other partners than their wives. The difference between this study and the former study is zero incidence of autoimmune diseases and other infectious diseases that may lead to false positive VDRL test results. Secondly, adherence to religious principles in the family contributed to zero prevalence of syphilis in Jahrom.

CONCLUSION

Given that no positive VDRL test result was reported, it is recommended that similar studies be carried out elsewhere in Iran. In case of similar results in other regions, the cost of VDRL test can be allocated to more important tests for detection of more common diseases.

RECOMMENDATIONS

1- More exact estimate of the prevalence of syphilis can be given in case of proper care system to collect information on high-risk groups.

2- It is recommended to carry out the VDRL test in high-risk groups (e.g. those infected with sexually transmitted diseases, AIDS, intravenous drug abusers and prostitutes) given the religious status, increased awareness and easy access to prenatal care services in this region. If the VDRL test

result was negative in the third month of pregnancy in the high-risk group, it is recommended to retest them in the 28th week of pregnancy.

3- Since average prevalence of hepatitis B was reported in Iran, it is recommended to allocate the cost of VDRL test to hepatitis B test.

4- It is recommended to perform further studies in other provinces and other cities. In case of similar results, it is recommended to eliminate the VDRL test from prenatal care services.

REFERENCES:

1. Harrison's principles of internal medicine kaspar Braunwald- Fauci-Hause-LangoJamson 16 edition, syphilis; 977-1010.
2. Mehnet Gence William j Ledger sexually Transmitted infection; Apr 2000, 76, 2; Health & Medical complete.
3. Mandell Douglas, Beenetts, Principles and Practices of infectious disease: 2484-2486.
4. Sharifi mod B, Metanat M. The iecessity of performing VDRL test during pregnancy in Sistan and Baluchestanan province, 2002, Mashad university "tagnesia, No.11 & 12: 44-47.
5. Van Eijk AM, Bles HM, Odfamcof, Aysis JG, Blokland IE, Rosen DH, Adazu K, Slusker l. Lindblade KA, use of antenatal servise and delivery :ar among woman in rural western Kenya community base: sur/ey, obstruct of Report Health, Apr 2006.
6. Tara F, Ensafi P. The necessity:5 performing VDRL test for syphilis screening in lran. The éranian J of obstetric Gynecology & Infertility, \/ol 4, N27 St 3 .2001-2002; p57.
7. Lumbijanon, Piajjio. Villar.Rinc.Bakketeing, Berjsjo, The epidemiolojy of syphilis in :.'egrancy: lnt J-STD-AIDS. 2002 Jul, 13(7): 487.-494.
8. Amaral-E, Faundes-A, Rev-Paul-Med, Prevaknce of HIV and TreponemaPallidum in pregnant Women in Compinas and their association with socio-demographio-factors, 1995 Ma-Apr; 114(2): 1108-16.
9. Kidan, Fantahun, Azez, Seroprevalence of HIV infection and association with syphilis seropositivity among antenatal clinic attenders at Debretobo, Rural hospital, ethiopia, east Afr-Med-J. 1995 Sep; 72(9), 579-83.
10. Cronje, Muir, Griessel, Hoek, Syphilis in Pregnant ptient and their offspring; Int-J-Gynaecol, obstetric, 1994 Feb; 44(2): 113-118.
11. Gyaneshywar, N. Sanze, Singh, Pillay, Seruatu, The prevalence of sexually transmitted disease agent in pregnant women in Suva, Aust-N-Z-J-obsted. Gynaecol. 1987 Aug; 27(3): 213-215.