

Research Article

Influence of Syphilis Infection on Abortions in Iraq

Hadeel Ali Mahamda¹, Ameen Abdulhasan Al Alwany²

¹Al-Iraqia University, College of Medicine, Iraq.

²University of Bagdad, College of Medicine, Iraq.

DOI: <https://doi.org/10.24321/0019.5138.2022101>

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Corresponding Author:

Ameen Abdulhasan Al Alwany, University of Bagdad, College of Medicine, Iraq.

E-mail Id:

ameen.a@comed.uobagdad.edu.iq

Orcid Id:

<https://orcid.org/0000-0002-3535-4023>

How to cite this article:

Mahamda HA, Alwany AAA. Influence of Syphilis Infection on Abortions in Iraq. J Commun Dis. 2022;54(4):41-45.

Date of Submission: 2022-11-04

Date of Acceptance: 2023-12-23

A B S T R A C T

Introduction: Syphilis is a sexually transmitted disease, that may be transferred from mothers to infants during pregnancy if it is left untreated.

Method: This study was conducted among 65 women who suffered from recurrent abortions in Iraq. Syphilis screening recombinant (IgM + IgG) level by ELISA, RADIM (Italy) and rapid plasma reagin (RPR) (positive and negative results) tests were used to analyse the data.

Results: A non-significant association was observed with age ($p=0.989$), and the number of healthy births ($p=0.643$). Non-significant differences were observed in comparisons between smoker and non-smoker percentages in the study group. The rapid test for syphilis confirmation was applied using Rapid Plasma Reagin (RPR) tests. There was a significant elevation in syphilis level (IgG + IgM) in the positive test ($p=0.027$). The number of abortions and births had a non-significant correlation ($p=0.318$ and 0.783 respectively). There was a non-significant weak correlation between syphilis level (IgG + IgM) and age. Syphilis level had a non-significant association with the number of abortions, births, and with duration of marriage. The abortion percentage distribution showed a high percentage in the first trimester (75%) in positive RPR patients and 70.7% in negative results of RPR test. The second-trimester cases were low in the positive and negative RPR results than the first-trimester cases.

Conclusion: The current study concluded that syphilis infection didn't have a significant influence on abortion in women and had a non-significant influence on the number of abortions.

Keywords: Influence, Syphilis Infection, Abortion

Introduction

Abortion has become one of the most significant health problems among fertile women in Iraq in the last few years. Different factors that contribute to the instances of miscarriage are infections from microorganisms, including

bacterial, viral and parasitic infections. Syphilis, a Sexually Transmitted Disease caused by (STD) bacterium *Treponema pallidum* is a major cause of this problem. The virulence and mechanism of *Treponema pallidum* infection are still under investigation,¹ and only a little information is known about its mechanism of action or what determines the

virulence of the infection. The infection by syphilis among fertile women may cause early loss of a foetus, premature birth, still birth, low weight at birth, neonatal and infant deaths, and congenital diseases among newborns.² Without screening and treatment of syphilis, about 70% of infected women will have an adverse pregnancy outcome.³

Experts recommend prenatal syphilis screening at the first prenatal visit and again at 32-36 weeks, if the woman is at risk for syphilis.^{4,5} Furthermore, a syphilis test must be implemented for any woman with a stillborn infant after 20 weeks of gestation.⁶ In the current study, the influence of syphilis infection in cases of abortion has been studied.

Methodology

The current study included 65 women who suffered from recurrent abortion and attended Al Karkh General Hospital during the study period (January-March). 30 healthy women were enrolled in a case-control study. Informed consent was obtained from all participants. Blood samples and data (age, number of abortions, number of healthy births, smoking, occupation, and duration of marriage) were collected from each patient. The serology tests included syphilis screening recombinant (IgM + IgG) level by ELISA, RADIM (Italy) and Rapid Plasma Reagin (RPR) (positive and negative results) tests. Diabetes mellitus patients, cancer patients, hypertensive patients and patients who consumed alcohol were excluded from the study. Data were represented as percentages and mean \pm SD, and the significance was detected at p-value less than 0.05 using independent sample t-test. Correlation coefficient was used to estimate the correlation between syphilis and age, abortion number, birth number and marriage duration at $p < 0.05$ and X^2 for multiple comparisons of observations. Ethical approval for the study was obtained from the Ministry of Higher Education and Scientific Research.

Results

The present study was suggested to determine the influence of syphilis infection on the number of abortions in Iraq. Results show a non-significant correlation with age ($p=0.989$), number of abortions (mean=3.86), and number of healthy births ($p=0.643$). The percentage of smokers in cases (21.53%) was less than that in the control group (10%). A non-significant correlation ($p=0.172$) was found with smoking. Occupation ($p=0.711$) and duration of marriage ($p=0.540$) also had a non-significant correlation (Table 1).

Syphilis levels (IgG + IgM) were detected in patients and control group. There was a slight difference between the levels of patients and control group (0.14 ± 0.06 , 0.13 ± 0.06 , $p = 0.294$). Non-significant differences were observed in comparisons between smokers and non-smokers between and within the groups (Table 2).

Table 1. Socio-Demographic Characteristics of Study Participants

Variables	Patients Group	Control Group	P-value
Age (years)	30.61 \pm 6.98	30.20 \pm 6.56	0.989*
Number of abortions	3.86 \pm 1.76	0	-
Number of healthy births	1.52 \pm 1.67	2.44 \pm 0.32	0.643*
Smoking Yes No	21.53% 78.46%	10% 90%	$X^2 =$ 1.85999 $P = 0.1726$
Occupation Yes No	80% 20%	76.6% 23.33%	$X^2 = 0.1372$ $P = 0.7111$
Marriage duration	8.18 \pm 4.87	5.62 \pm 0.62	0.540*
*independent sample t-test X^2 : Chi-square test			

Table 2. Association of Syphilis Levels (IgG + IgM) in Study Groups with Smoking and Occupation

Variables	Patients Group	Control Group	P-value
Syphilis level (IgG + IgM)	0.14 \pm 0.06	0.13 \pm 0.06	0.294
Smoking Yes No	0.136 \pm 0.059 0.1415 \pm 0.068	0.109 \pm 0.023 0.133 \pm 0.05	0.552 0.580
P	0.788	0.527	
Occupation Yes No	0.1396 \pm 0.07 0.1442 \pm 0.05	0.1317 \pm 0.05 0.1309 \pm 0.026	0.636 0.552
P-value	0.827	0.968	
Independent sample t test			

Syphilis was confirmed using rapid plasma reagin (RPR) tests. There was a significant elevation in the syphilis level (IgG + IgM) in the positive test ($p = 0.027$). The number of

abortions and births showed a non-significant correlation ($p = 0.318$ and 0.783 respectively) (Table 3).

Table 3. Syphilis Level (IgG + IgM), and Number of Births and Abortions in Patients Group using Rapid Plasma Reagin (RPR) Tests

Variables	Positive Test	Negative Test	P-value
Percentage	6.15	93.84	-
Syphilis level (IgG + IgM)	0.21 ± 0.195	0.13 ± 0.05	0.027*
Number of abortions	3.00 ± 0.81	3.91 ± 0.23	0.318
Number of births	1.75 ± 1.50	1.50 ± 0.21	0.783
Independent sample t test, * significant differences			

The correlation between syphilis level (IgG + IgM) and age shows a non-significant weak correlation ($r=0.148$, $p=0.239$). Syphilis level also shows a non-significant correlation with the number of abortions ($r=0.009$, $p=0.945$), number of births ($r=0.122$, $p=0.334$) and duration of marriage ($r=0.029$, $p = 0.819$) (Figure 1).

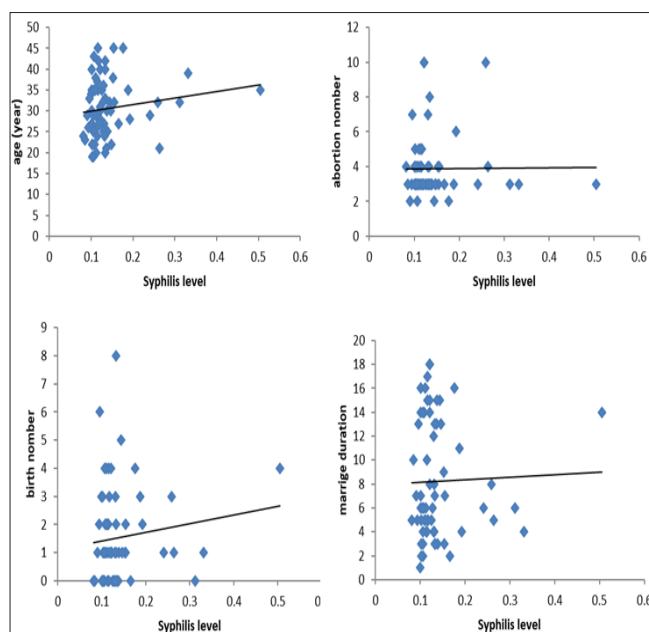


Figure 1. Correlation between Syphilis Level (IgG + IgM) and Age, Number of Abortions and Births and Duration of Marriage in the Patient Group

In the current study, the abortion percentage distribution shows a high percentage in the first trimester (75%) in positive RPR patients and 70.7% in negative results of RPR

test. The second-trimester cases were low in the positive and negative RPR results (Table 4).

Table 4. Abortion Percentage Distribution according to the Trimester of Abortion

Rapid Plasma Reagin (RPR) Tests	Abortion n (%)	First-trimester n (%)	Second-trimester n (%)	Total of First and Second Trimesters n (%)
Positive RPR tests	12 (4.78)	9 (75)	3 (25)	12 (100)
Negative RPR tests	239 (95.21)	169 (70.71)	70 (29.28)	239 (100)
Total abortions n (%)	251 (100)			

Discussion

The present study deals with the effect of syphilis infection on abortion during pregnancy. The results indicate that a positive confirmatory test of syphilis infection was seen in a low percentage of women with abortions and this was consistent with other studies in the Western world. In this era, the prevalence of seropositivity in pregnancy ranges between 0.02 and 4.5% in northern Europe and the United States after accounting for biological false reactive tests.^{6,12}

The level of syphilis shows non-significant changes in study groups and is not affected by smoking, occupation, or the number of births and abortions. This may be because in the Iraqi population, illegal relationships are low and this prevents sexually transmitted infections. Perhaps, there were other factors that contributed to abortions in the present study that must be studied like other microbial infections and genetic problems.

The data about syphilis infection in Iraq is less. In an Iraqi study, a low infection percentage was observed among expatriate workers in Iraq; about 30% of the study population was positive for syphilis.¹³ In UAE, the infection was 51%,¹⁴ in India, it was 30.5%, followed by Pakistan (25.7%) and Bangladesh (15.2%).¹⁵ Another study found a low percentage (0.76%) of *Treponema pallidum* infection in blood donors in Karbala province.¹⁶ Syphilis is observed in about one million women every year in pregnancy and leads to more than 600,000 congenital syphilis cases and about 350,000 adverse birth outcomes, with more than 200,000 neonatal deaths or stillbirths.¹⁷

In spite of a lower infection percentage in aborted women in the current study, a high percentage of abortions was

observed in the first trimester. Various epidemiological studies proved that syphilis has been detected in the first two trimesters of pregnancy in several countries and this ensures the possibility of early treatment to prevent adverse birth outcomes. This was suggested by a systematic review and meta-analysis that included 1,199 publications. This analysis found a lower prevalence of any adverse outcome among females who received an intervention (to include screening and treatment) in the first and second trimesters of pregnancy compared to the third trimester. Another outcome recorded heterogeneity between studies, except for the studies reporting an infected infant.^{18,19} The transmission risk of maternal syphilis to the foetus is as high as 100% in primary syphilis, while it is lower in early and latent syphilis with transmission rates of 40% and 10%, respectively.²⁰

Some adverse health outcomes in the case of pregnant women, like perinatal death and infant infections, can be prevented by early detection and treatment with antibiotics. Some countries developed guidance for syphilis management during pregnancy based on WHO recommendations.²¹ Untreated syphilis in reproductive females proposes significance since the infection can be transmitted to the foetus.¹ Congenital syphilis can be eliminated by effective screening and adequate treatment of infected, pregnant women.²²

Limitations

The limitations of the present study include restricted sample size and the possible inaccuracy of data obtained from patients. The current study needs further evidence about other factors implicated in abortion in Iraq.

Conclusion

The current outcome concluded that there was a low percentage of syphilis infection in women who had abortions. Syphilis has a non-significant influence on the number of abortions, thus other factors may be responsible for the elevation of abortion percentage in the Iraqi population.

Source of Funding: None

Conflict of Interest: None

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