Chlamydia Trachomatis Infection and Spontaneous Abortion

Infeksi Chlamydia Trachomatis dan Abortus Spontan

Rahayu Basir, Eddy Hartono, Eddy R. Moeljono, St. Nur Asni

Department of Obstetrics and Gynecology
Faculty of Medicine Universitas Hasanuddin
Dr. Wahidin Sudirohusodo General Hospital
Makassar

Abstract

Objective: To determine the correlation between spontaneous abortion and Chlamydia trachomatis infection.

Methods: A cross-sectional study was conducted in women who experienced spontaneous abortion. Normal pregnancies with gestational age ≥ 37 weeks as control. Detection of C. trachomatis in the product of conception or placenta from curettage using the PCR method.

Results: Positive C. trachomatis was found 3 cases in the abortion group and 4 cases in control. In the abortion group, C. trachomatis found in 1 case with vaginal discharge history and 2 cases without this history. C. trachomatis also found in 3 cases without a history of abortion. This bacteria was not found in patients with an abortion history. In the control group, 2 cases of positive C. trachomatis were found in pregnant women with or without a history of vaginal discharge and abortion, respectively. There were no significant differences regarding the positive of C. trachomatis between the two study groups regarding history of vaginal discharge and abortion.

Conclusions: Spontaneous abortion does not correlate with C. trachomatis infection.

Keywords: chlamydia trachomatis, infection, spontaneous abortion.

INTRODUCTION

Chlamydia trachomatis is the most common cause of sexually transmitted infections. The prevalence of this bacteria in women aged 15–49 years based on the region of 5.1 million (2.6%) in Africa, 5 million (1.1%) in Southeast Asia, and 20.5 million (4.3%) in the West Pacific. This bacterial infection in pregnant women is asymptomatic; thereby, increasing the risk of adverse pregnancy outcomes. Infection during pregnancy is a risk factor for abortion (termination of spontaneous pregnancy before a gestational age of 24 weeks), fetal death at gestational age ≥28 weeks and preterm birth through direct infection at fetal, placental damage and severe maternal disease.

A high prevalence of C. trachomatis infection in spontaneous abortion or recurrent abortion has been reported. C. trachomatis persistent infection is determined by serum IgA levels.
against the main membrane outer protein of this bacterium. The correlation between abortion and chlamydial infection is demonstrated through anti-chlamydia antibodies IgG and IgA and detection of chlamydial antigens/DNA from the product of conception and placental. However, the inability to detect IgM or to isolate C. trachomatis from seropositive patients indicated that Chlamydia species are not directly related to abortion. A small meta-analysis from 4 studies shows an association between C. trachomatis infection and abortion. This study aims to determine the correlation between spontaneous abortion and C. trachomatis infection.

METHODS

A cross-sectional study was conducted on women who experienced spontaneous abortion in several hospitals in Makassar. A normal pregnancy with gestational age ≥37 weeks as control. Detection of C. trachomatis in the product of conception or placenta from curettage using the PCR method. A p-value <.05 were considered statistically significant. The study approved by the Medical Research Ethics Committee of Universitas Hasanuddin /Dr. Wahidin Sudirohusodo General Hospital.

RESULTS

Table 1. Patients characteristics

| Characteristics     | Spontaneous abortion (n=42) | Control (n=42) | P-value |
|---------------------|-----------------------------|----------------|---------|
| n                   | %                           | n              | %       |
| Age (yo)            |                             |                |         |
| <20                 | 5                           | 7              | 0.802   |
| 20-35               | 31                          | 30             |         |
| >35                 | 6                           | 5              |         |
| Education (years)   |                             |                |         |
| <9                  | 6                           | 5              | 1.000   |
| ≥9                  | 36                          | 37             |         |
| Occupation          |                             |                |         |
| Working             | 22                          | 15             | 0.187   |
| Not working         | 20                          | 27             |         |

Table 2. PCR Results on C. Trachomatis Infection

| Study groups        | PCR + | PCR - | P-value |
|---------------------|-------|-------|---------|
| n                   | %     | n     | %       |
| Spontaneous abortion (N=42) | 3     | 39    | 0.697   |
| Control (N=42)      | 4     | 38    |         |

Table 3. C. Trachomatis Infection Based on Vaginal Discharge and Abortion History

| History             | Spontaneous abortion (n%) | Control (n%) | P-value |
|---------------------|---------------------------|--------------|---------|
|                     | PCR (+) | PCR (-) | P-value | PCR (+) | PCR (-) | P-value |
| Vaginal discharge   |           |          |         |           |          |         |
| Positive            | 1(11.1) | 8(88.9) | 0.525   | 2(20)    | 8(80)   | 0.236   |
| Negative            | 2(6.1)  | 31(93.9)|          | 2(6.2)  | 30(93.8)|         |
| Abortion            |           |          |         |           |          |         |
| Yes                 | 0 (0)    | 11(100) | 0.554   | 2(13.3)  | 13(86.7)| 0.608   |
| No                  | 3(9.7)  | 28(90.3)|          | 2(7.4)  | 25(92.6)|         |

Positive C. trachomatis was found in 3 cases in the abortion group and 4 cases in control (Table 2). There was no significant difference between the two study groups (p>.05). Further findings in the abortion group, C. trachomatis found in 1 case with vaginal discharge history and 2 cases without this history. C. trachomatis also found in 3 cases without a history of abortion. Conversely, this bacteria was not found in patients with abortion history. There were no significant differences (p<.05) between the two histories in the abortion group. In the control group, 2 cases of positive C. trachomatis were found in pregnant women with or without a history of vaginal discharge and
abortion, respectively. There were no significant differences (all $p > .05$) regarding the positive of C. trachomatis between the two study groups based on a history of vaginal discharge and abortion (Table 3).

**DISCUSSION**

The present study found C. trachomatis infection detected in spontaneous abortion patients with or without vaginal discharge. These findings indicated that C. trachomatis infection has no correlation with vaginal discharge. Our findings that vaginal discharge was not correlated with C. trachomatis infection. C. trachomatis is an intracellular bacterium with the ability to change from the form of replication that protects the host cell lead to the elimination of microbes more difficult. Infection caused by this bacteria often without clinical symptoms (asymptomatic); therefore, it is difficult to assess the spread of this infection.

In the present study, positive C. trachomatis was found both in spontaneous abortion and control groups, but the difference was not significant. Women with positive chlamydial serological tests are at risk for abortion and C. trachomatis DNA was present in the conception and placental products of these women compared to controls. Therefore, not all pregnant women who are detected to have C. trachomatis infection will experience an abortion. Therefore, the pregnancy can reach term accompanying by preventive management.

Vaginal discharge can be used to determine vaginal infections by C. trachomatis using vaginal discharge flowcharts with a sensitivity 91.68%, specificity 99.97% and positive predictive value (PPV) 99.93%. Vaginal discharge is more commonly found as asymptomatic urogenital infection in 50% of patients. In addition, vaginal discharge can be used as a symptomatic diagnosis of vaginal infections including C. trachomatis infection.

Another finding of our study is abortion history has no statistically significant relationship with the incidence of C. trachomatis infection. However, the Kashanian study reported that spontaneous abortion history in the first pregnancy had a higher risk of having an abortion in the second pregnancy compared to women who had the first pregnancy with a live newborn.

The limitation of this study is that women with positive C. trachomatis cannot be distinguished whether the infection is acute or chronic. The descriptive method with a small sample proportion is also limited to our study when compared with comparative analytic studies with a larger sample size. The present study variables do not represent the factors that influence chlamydial infection as one of the sexually transmitted diseases.

**CONCLUSION**

Spontaneous abortion does not correlate with Chlamydia trachomatis infection.

**REFERENCES**

1. World Health Organization Department of Reproductive Health Research. Global incidence and prevalence of selected curable sexually transmitted infections – 2008. World Health Organization Department of Reproductive Health Research, Geneva, Switzerland. 2012.
2. Adachi K, Nielsen-Saines K, Klausner JD. Chlamydia trachomatis infection in pregnancy: the global challenge of preventing adverse pregnancy and infant outcomes in Sub-Saharan Africa and Asia. Biomed Res Int. 2016;2016:9315757.
3. Vigil P, Tapia A, Zacharias S, Riquelme R, Salgado AM, Varleta J. First-trimester pregnancy loss and active Chlamydia trachomatis infection: correlation and ultrastructural evidence. Androl. 2002;34:373–8.
4. Witkin SS, Ledger WJ. Antibodies to Chlamydia trachomatis in sera of women with recurrent spontaneous abortions. Am J Obstet Gynecol.1992;167:135–9.
5. Baud B, Regan L, Greub G. Emerging role of Chlamydia and Chlamydia-like organisms in adverse pregnancy outcomes. Curr Opin Infect Dis. 2008;21(1):70–6.
6. Arsovic A, Nikolov A, Sazdanovic P, Popovic S, Baskic D. Prevalence and diagnostic significance of specific IgA and anti-heat shock protein 60 Chlamydia trachomatis antibodies in subfertile women. Eur J Clin Microbiol Infect Dis. 2014;33:761–6.
7. Rastogi S, Salhan S, Mittal A. Detection of Chlamydia trachomatis antigen in spontaneous abortions. Is this organism a primary or secondary indicator of risk? Br J Biomed Sci. 2000;57(2):126–9.
8. Mårdh PA. Influence of infection with Chlamydia trachomatis on pregnancy outcome, infant health and life-long sequelae in infected offspring. Best Pract Res Clin Obstet Gynecol. 2002;16(6):847–64.
9. Baud D, Goy G, Jonot K, Osterheld MC, Blumer S, et al. Role of Chlamydia trachomatis in miscarriage. Emerg Infect Dis. 2011;17(9):1630–5.
10. Silva MJ, Florêncio GL, Gabiatti JR, Amaral RL, Eleutério Júnior J, Gonçalves AK. Perinatal morbidity and mortality associated with chlamydial infection: a meta-analysis study. Braz J Infect Dis. 2011;15(9):1630–5.
11. Silva MJ, Florêncio GL, Gabiatti JR, Amaral RL, Eleutério Júnior J, Gonçalves AK. Perinatal morbidity and mortality associated with chlamydial infection: a meta-analysis study. Braz J Infect Dis. 2011;15(9):1630–5.
12. Geisler WM, Uniyal A, Lee JY, et al. Azithromycin versus doxycycline for urogenital Chlamydia trachomatis Infection. N Engl J Med. 2015;373(26):2512–21.
13. Zemouri C, Wi TE, Kiarie J, et al. The performance of the vaginal discharge syndromic management in treating vaginal and cervical infection: a systematic review and meta-analysis. PLoS One. 2016;11(10):e0163365.
13. Wangnapi RA, Soso S, Unger HW, et al. Prevalence and risk factors for Chlamydia trachomatis, Neisseria gonorrhoeae and Trichomonas vaginalis infection in pregnant women in Papua New Guinea. Sex Transm Infect. 2015;91(3):194-200.

14. Kashanian M, Akbarian AR, Baradaran H, Shabandoust SH. Pregnancy outcome following a previous spontaneous abortion (miscarriage). Gynecol Obstet Invest 2006;61:167–70.