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A Case–control Study on the Relationship between *Mycoplasma genitalium* Infection in Women with Normal Pregnancy and Spontaneous Abortion using Polymerase Chain Reaction

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Abstract

Objectives: *Mycoplasma genitalium* infections are suggested as causes of a number of pathological outcomes in pregnant women. The aim of this study was to evaluate the frequency of *M. genitalium* infections among pregnant women and its association with spontaneous abortion.

Methods: In this case–control study we included 109 women with spontaneous abortion with a gestational age of 10–20 weeks (patients), and 109 women with normal pregnancy with a gestational age of 20–37 weeks (controls) in Sanandaj, Iran. Using specific primers and extracted DNA from endocervical swabs, a polymerase chain reaction was conducted for the detection of *M. genitalium* infection in both groups.

Results: The frequency of *M. genitalium* infection in patient and control groups was one (0.91%) and three (2.75%), respectively. In both control and patient groups using Fisher test, no association between mycoplasma infection and spontaneous abortion was seen.

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Conclusion: *M. genitalium* may be positive in the genital tract of some pregnant women but was not associated with spontaneous abortion. Further powerful studies with larger sample sizes are needed for the determination of a possible role of *M. genitalium* in pregnancy outcomes and spontaneous abortion.

1. Introduction

Spontaneous abortion prior to 20 weeks is a common adverse outcome of pregnancy, occurring in up to 15% of clinically recognized pregnancies. Usually spontaneous abortions occur in the first trimester due to phenotypic and/or chromosomal abnormalities, while environmental factors may have a greater impact on spontaneous abortion in later months of pregnancy [1]. Evidence suggests that maternal genitourinary and intrauterine infections have been proposed as an etiology for complications in pregnancy [2,3]. Mycoplasmas including *Mycoplasma genitalium*, *Mycoplasma hominis*, and *Ureaplasma* spp. are causes of sexually transmitted diseases (STDs) in men and women worldwide. About 80% of infected women and 50% of infected men may be asymptomatic [4]. *M. genitalium* and *M. hominis* are suggested as causes of a number of pathological outcomes in pregnant women. *M. hominis* was isolated from the amniotic fluid in 30% of women with intra-amniotic infection and was shown to be associated with preterm birth. *M. genitalium* is suggested to cause urethritis in men, mucopurulent cervicitis in women, and as an etiology of pelvic inflammatory disease independent of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* [1,5]. In addition to cervicitis, it has been detected in confirmed salpingitis and endometritis.

The most common pathway of intrauterine infection is vaginal and cervical infections and ascending route to amniotic cavity [6]. In addition, coinfection of mycoplasmas with other bacteria in the maternal genital tract during early gestation or preconception has been associated with spontaneous preterm birth, preterm premature rupture of the membranes, prematurity, spontaneous abortion, and perinatal morbidity and mortality [7–9]. Although mycoplasmas have been associated with these morbidities, the exact role of the *M. genitalium* in the etiology of spontaneous abortion has not been determined because of the difficulty in culturing it from clinical samples. Thus, association between mycoplasma infection and pregnancy outcome seems to be more reliable due to the development of sensitive molecular diagnostic methods such as polymerase chain reaction (PCR) [10]. In a study in Brazil, Campos et al [11] using quantitative PCR in 302 women showed that *M. hominis* and *M. genitalium* were detected in 31.8% and 28.1% of samples, respectively. Ahmadi et al [12], in a case–control study in Iran on 109 women with spontaneous abortion (patients) and 109 women with

normal pregnancy (controls) using PCR reported that in patients the rate of *C. trachomatis* infections was 22.9% and 11.9% in control. The association between *C. trachomatis* infection and spontaneous abortion had statistically significant. Hitti et al [13], in a case–control study in Peru using culture medium reported that in 661 cases with spontaneous preterm birth and 667 controls with normal delivery, *M. genitalium* was detected in 3% of them and was not a risk factor for preterm birth. Developed countries have established a national program for prenatal screening for infections in women, but in hospitals and clinics of Iran, there is such no national program [14]. The consequences of *M. genitalium* infection in pregnancy adverse outcome are unknown. The aim of this case–control study was to evaluate the frequency of *M. genitalium* infections among two groups of pregnant women (normal pregnancy and spontaneous abortion) and its association with spontaneous abortion.

2. Material and methods

2.1. Participants

This case–control and observational study was conducted in 2013. Pregnant women, attending the participating midwifery practices in the obstetrics and gynecology section or prenatal clinic and expected to deliver, were eligible for the study in Beasat Hospital, Sanandaj, Iran. We included 109 women (age, 19–43 years) with spontaneous abortion with a gestational age of 10–20 weeks (patients), and 109 (aged 19–43 years) women with normal pregnancy with a gestational age of 20–37 weeks (controls). Both groups included 26 women older than 25 years and 83 women younger than 25 years. Women expressed their informed consent to participate in this study. Demographic information such as age, education status, place of residence, occupation, and obstetrical data such as the number of childbirths, miscarriage, premature delivery, genital infection, urinary infection, the gestational age, and contraceptive methods before pregnancy were asked in a questionnaire and by a gynecologist. Inclusion criteria were having sexual activity and no use of antibiotics 2 weeks before sampling. Exclusion criteria were immunodeficiency, persons with chronic diseases (diabetes, endocrine disorders, and hypertension), recurrent miscarriage due to anatomic injury, and positive tests of first and second screening tests. In addition to asking when the 1st

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