

Original Paper

The Relationship Between Self-treatment of Genital Infection and Ectopic Pregnancy



Shirin Parvinroo¹, Seyedeh Hajar Sharami^{2*}, Ariadokht Ardeshiri³, Maryam Shakiba⁴, Soodabeh Ebrahimi⁵

1. Assistant Professor, Department of Pharmacognosy, School of Pharmacy, Guilan University of Medical Sciences, Rasht, Iran.

2. Professor, Department of Obstetrics & Gynecology, Reproductive Health Research Center, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.

3. Pharmacist, Department of pharmacognosy, School of Pharmacy, Guilan University of Medical Sciences, Rasht, Iran.

4. Assistant Professor, Department of Epidemiology and Biostatistics, School of Health, Guilan University of Medical Sciences, Rasht, Iran.

5. Midwifery (MSc), School of Health, Reproductive Health Research Center, Guilan University of Medical Sciences, Rasht, Iran.



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ABSTRACT

Introduction: One of the contributing factors in ectopic pregnancy is genital infection. The self-treatment of genital infections is a common practice that results in infectious diseases, microbial resistance, and no patient recovery.

Objective: This study aimed to determine the relationship between the self-treatment of genital infection and ectopic pregnancy.

Materials and Methods: This case-control study was performed on 373 women in 2018. Samples included 180 normal pregnant women (the control group) and 193 women with ectopic pregnancies with histories of genital infections (the case group). The samples were selected by a convenient sampling method. The study data were collected by a researcher-made questionnaire containing demographic questions and 36 questions about self-treatment of genital infections, drug type, and reasons to use self-medication. Descriptive statistics, the Chi-square test, and the logistic regression model were used to analyze the obtained data.

Results: In the present study, 373 eligible people were included. The Mean±SD age of women with ectopic pregnancies (the case group) was 33.37±4 years and of women with normal pregnancy (the control group) was 33.21±3.18 years. The frequency of ectopic pregnancy in women over 35 years was higher than that in women with normal pregnancies. The frequency of individuals who used self-medication to eliminate the vaginal infection in the control group and the case group were 76.7% and 48.9%, respectively. Washing the vagina with ice or baking soda (64.39%) was the major traditional method that was used by the women.

Conclusion: The results of this study show that self-medication for vaginal infections can be a risk factor for ectopic pregnancy. Therefore, the community should be educated to avoid the self-medication of genital infections.

* Corresponding Author:

Seyedeh Hajar Sharami, MD.

Address: Department of Obstetrics & Gynecology, Reproductive Health Research Center, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.

Tel: +98 (13) 33369224

E-mail: sharami@gums.ac.ir

Highlights

- Ectopic pregnancy is the most common reason for maternal mortality in the first trimester of pregnancy.
- One of the effective factors in ectopic pregnancy is genital infection and its incorrect or incomplete treatment.
- Self-medication is common in Iran, and microbial resistance and lack of improvement in infectious diseases are some of its consequences.

Plain Language Summary

Ectopic pregnancy is the most common reason for maternal mortality in the first trimester of pregnancy. One of the effective factors in ectopic pregnancy is genital infection. The self-medication of genital infections is a common phenomenon that results in infectious diseases, microbial resistance, and a lack of patient recovery. In the present study, 180 normal pregnant women and 193 women with ectopic pregnancies with a history of genital infection participated. This study aimed to determine the relationship between the self-treatment of genital infections and ectopic pregnancy. The results of this study show that self-medication for vaginal infections can be a risk factor for ectopic pregnancy.

Introduction

Ectopic pregnancy is the most common reason for maternal mortality in the first trimester of pregnancy. In an ectopic pregnancy, the fetus is located outside the uterine cavity and often in the fallopian tubes, which is one of the most dangerous cases of pregnancy and mostly requires immediate intervention. Otherwise, it can cause tubal rupture and tubal miscarriage, or miscarriage, and 6% of maternal deaths are due to ectopic pregnancy [1]. A review study showed that the prevalence of ectopic pregnancy in Iran was 1.9 in 1000 pregnancies before 2006, 3.7 after 2006, and 44 in infertility centers [2]. This obvious increase in the prevalence of ectopic pregnancy can be due to improved initial diagnosis and increased risk factors for this complication. Although the mortality rate has decreased due to early detection, its long-term psychological complications are still high [1, 3].

Various risk factors for ectopic pregnancy have been identified in the female population. One of the main factors of ectopic pregnancy is a previous infection of the reproductive system and its incomplete and incorrect treatment [4, 5]. Nowadays, excessive drug use and generally self-medication are among the biggest social, health, and economic problems in societies [6]. It is estimated that 83.3% of Iranians use drugs arbitrarily [7]. Antibiotics are the most important drugs used irrationally and arbitrarily in Iran. Numerous parameters that have been identified as effective factors on self-medication include keeping drugs at home, believing that self-

medication is harmless, lacking time to go to a doctor to treat the problem, delivering medicine by pharmacies without a doctor's prescription, treating symptomatically by the doctor, assuming that the problem is insignificant, not taking the disease seriously, being afraid of treatment, having expensive doctors' visits, having experience in the treatment of diseases, lacking access to a doctor due to financial poverty, not being covered by health insurance, lacking proper knowledge of the drug effects, having no trust in doctors, lacking a sense of need to see a doctor, having crowded doctor's office or medical centers, having cheap drugs, and mistrusting drug quality [8].

As mentioned above, one of the effective factors in ectopic pregnancy is genital infection and its incorrect or incomplete treatment. Self-medication is common and microbial resistance, and lack of improvement in infectious diseases are some of its consequences. Therefore, the present study was conducted to determine the relationship between the self-treatment of genital infections and ectopic pregnancy in women.

Materials and Methods

The present study was a case-control study conducted by convenient sampling method on 373 women referring to one of the specialized educational and medical centers for women in Rasht City, Iran, in 2018. Based on a pilot study in a study center in 2017 on 52 healthy individuals and 45 patients with the case, a 24% exposure ratio in the ectopic pregnancy group and 15% in

the control group has been estimated. Considering an 80% power, 95% confidence level and the 1:1 ratio of the case to control, 304 patients in both study groups were calculated. It should be noted that after sampling during 2018, the total sample size was 373, of which 180 were normal pregnant women, and 193 were ectopic pregnant women with a history of genital infection.

The inclusion criteria include women with ectopic or normal pregnancies in the age range of 15 to 45 years with a history of genital infections, the willingness to participate in the study, no long history of drug use or physical or mental illness, and the ability to speak. In case of lack of recall, half of the information would be excluded from the study. During the study, the purposes and plans were expressed to patients. After obtaining written consent, the samples were divided into two pregnant women groups with normal intrauterine pregnancy in the control group and with ectopic pregnancy in the case group (Figure 1).

The questionnaire that was used for data collection contained demographic questions including age, job, education level, number of children, age of marriage, history of abortion, history of surgery, history of use contraception, history of infertility, history of cesarean section, referral to a gynecologist, self-medication of

genital infections and the drug type in self-medication (chemical, traditional, herbal, supplement).

To evaluate the validity of the questionnaire content, the opinions of a 6-member panel of clinical pharmacists and gynecologists were used. The validity of the present questionnaire was measured by the content validity method. After correcting some of the problems and ambiguities, its validity was confirmed. The content validity ratio and content validity index were 90% and 100%, respectively.

Data were collected through interviews when individuals who met the inclusion criteria; questions were asked and recorded by the researcher. SPSS software (23 versions) was used to analyze the data. The qualitative indicators were described based on the frequency, and the quantitative indicators were described based on mean and standard deviation. The Chi-square test was used to compare the qualitative variables, and the logistic regression model was used to estimate the odds ratio with 95% confidence interval. P values of less than 0.05 were set to be significant.

Results

In the present study, 382 people were interviewed, and finally, 373 eligible people were included in the

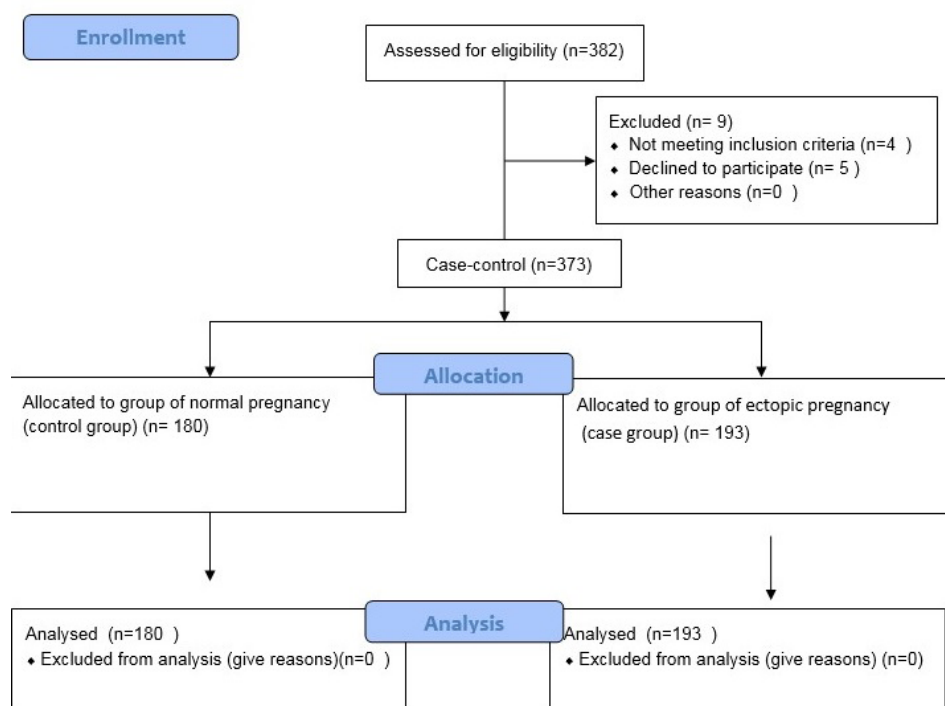


Figure 1. CONSORT flow diagram

Table 1. Demographic characteristics of pregnant women with normal or ectopic pregnancies

Variables	Condition	No. (%)		P*
		Ectopic Pregnancy (n=193)	Normal Pregnancy (n=180)	
Age (y)	<35	130(67.4)	145(80.6)	0.004
	≤35	63(32.6)	35(19.4)	
Job	Housewife	181(93.8)	147(81.7)	0.001
	Farmer	7(3.6)	23(12.8)	
	Employee	5(2.6)	10(5.6)	
Women's education	Under Diploma	93(48.2)	62(34.4)	0.009
	Diploma	92(47.7)	101(56.1)	
	University	8(4.1)	17(9.4)	
Number of children	No children	76(39.4)	47(26.1)	0.023
	One child	63(32.6)	75(41.7)	
	Two children or more	54(28)	58(32.2)	
Age at Marriage	> 35	38(19.7)	69(38.3)	0.001
	≤35	155(80.3)	111(61.7)	
History of abortion	No	158(81.9)	163(90.6)	0.015
	Yes	35(18.1)	17(9.4)	
History of cesarean section	No	149(77.2)	154(85.6)	0.039
	Yes	44(22.8)	26(14.4)	
History of infertility	No	156(80.8)	126(70)	0.015
	No	37(19.2)	54(30)	

*Chi-square test

study, 180 were in the group normal pregnancy (the control group), and 193 were in the group ectopic pregnancy (the case group).

The Mean±SD age of women with ectopic pregnancies (the case group) was 33.37±4 years, and of women with normal pregnancies (the control group) was 33.21±3.18 years. In general, the contextual characteristics of the studied samples in the two groups indicated that 36.3% of pregnant women had a history of gynecological surgery, and 44% had a history of contraception. The frequency of ectopic pregnancy (32.6%) in women over 35 years was higher than that in women with normal pregnancies. We found a statistically significant difference (Table 1) between the two study groups in terms of age groups, occupation, and education (P=0.004, P=0.001,

and P=0.009 respectively). Also, the percentage of ectopic pregnancy in women with no children (39.4%), age of marriage over 35 years (80.3%), with a history of abortion (18.1%), and cesarean section (22.8%) was higher than those with the normal pregnancies. By using the Chi-square test, we found a statistically significant difference between the number of children (P=0.023), age of marriage (P=0.0001), history of cesarean section (P=0.039), history of abortion (P=0.015), and history if infertility (P=0.015) in two groups of normal pregnancy and ectopic pregnancy. The percentage of referring to a gynecologist for women with ectopic pregnancies was lower than that for women with normal pregnancies (59.1%). Also, there was a significant relationship between referring to a gynecologist in pregnant women

Table 2. Distribution of self-medication and referring to a gynecologist due to a genital infection in the study groups

Variable		No. (%)		P *
		Ectopic Pregnancy	Normal Pregnancy	
History of self-medication	Yes	148(76.7)	88(48.9)	0.001
	No	45(23.3)	92(51.1)	
Refer to a gynecologist	Yes	114(59.1)	164(91.1)	0.001
	No	79(40.9)	16(8.9)	

*The Chi-square test.

with a history of genital infection in two groups of normal pregnancy and ectopic pregnancy ($P=0.0001$).

The percentage of self-medication history of genital infections in the group of ectopic pregnancies was higher than the normal pregnancy group (76.7% vs 48.9%). A significant statistical relationship was observed (Table 2) between the history of self-medication in pregnant women with a history of genital infections in two groups of women with normal pregnancy and ectopic pregnancy ($P=0.0001$). Out of 236 women who had self-medication, 159 women used traditional methods or drugs (114 women used one method, 41 women used two methods, and 4 women used three methods), and 108 women used other types of chemical drugs (101 women used one method and 7 women used two methods). Also, 31 women used both

traditional and chemical methods simultaneously. Among the traditional methods, using an ice compress and washing the vagina with baking soda, yogurt, and vinegar solution with percentages of 29.3%, 26%, 19.7%, and 18.7%, respectively, were more common. Among the various chemical drugs, vaginal douching with 53%, oral medication with 18.3%, vaginal cream with 16.5%, and topical ointment with 12.2% were more common. The most common causes of self-medication in pregnant women with a history of genital infection were the insignificant disease and the lack of requirement to a specialist (29.2%).

In the multivariable logistic regression model, the variables of women's education, age of marriage, history of infertility, and self-medication were independently associated with ectopic pregnancy. The odds of ectopic pregnancy in women

Table 3. Adjusted odds ratio of self-medication and contextual variables with the outcome of ectopic pregnancy

Variables		OR	S.E	95% CI Lower-Upper	P
Job	Age (y)	1.042	0.034	0.974-1.115	0.234
	Employee	-	-	-	0.053
	Farmer	1.372	0.776	0.300-6.284	0.683
	Housewife	0.347	0.970	0.052-2.321	0.275
Women's education	Under Diploma	Reference	-	-	
	Diploma	0.617	0.255	0.374-1.018	0.059
	University	0.264	0.621	0.078-0.891	0.032
Number of children		0.784	0.172	0.560-1.098	0.157
Age at marriage (y)		1.10	0.035	1.026-1.179	0.007
History of abortion		1.723	0.358	0.855-3.474	0.128
History of cesarean section		1.551	0.338	0.800-3.008	0.194
History of infertility		0.529	0.299	0.294-0.950	0.033
History of self-medication		2.227	0.268	1.316-3.769	0.003

with academic education was 74% lower than women with under diploma education (OR=0.26, 95%CI;0.078-0.891, $P = 0.032$). For every one-year increase in age at marriage, the odds of ectopic pregnancy increased by 10% (OR= 1.10, 95%CI;1.026-1.179, $P=0.007$). History of infertility was conversely associated with ectopic pregnancy and women with a history of infertility had lower probability of EP than those without (OR=0.529, 95%CI;0.294-0.950, $P=0.033$). The odds of ectopic pregnancy in women who used self-medication was 2.2 times more than non-self-medication group (95% CI; 1.316-3.77) (Table 3).

Discussion

In the present study, the frequency of self-medication was higher in women with ectopic pregnancies, and a statistically significant relationship was found between the history of self-medication and history of genital infection in both groups (normal pregnancy and ectopic pregnancy). In a study by Abeje et al. [7], 310 pregnant women had arbitrary drug use during pregnancy, either in the modern form or in the form of traditional herbal medicines. In addition, many pregnant and non-pregnant women think that natural treatments with herbal medicines are not problematic and do not have any side effects for the mother or the fetus. Therefore, they treat themselves to herbal ingredients. In another study [9], it was found that self-medication could increase the probability of preterm birth by 2 to 3 times or cause miscarriage or fetal malformation. As stated earlier, in the present study, the probability of ectopic pregnancy was significantly higher in women with a history of self-medication. In the study of Ebrahimi et al. [9], which was performed on self-medication and its risk factors before and after pregnancy in pregnant women, it was found that the prevalence of self-medication in women was 63.9% before pregnancy and 43.5% during pregnancy.

Genital infections are an important cause of disease and death in women during childbearing age. These diseases cause complications such as miscarriage, cervical cancer, and preterm birth, but they also cause long-term damage such as infertility and chronic pelvic pains [10, 11]. Misinformation and lack of knowledge of appropriate methods and sufficient treatment of these diseases are major public health problems worldwide [12–14].

In the present study, the percentage of lower education (i.e., under diploma) and housewife job in ectopic pregnancy group was higher than normal pregnancy group. In a similar study on women referring to Melbourne dermatology clinics [15], found that majority of their samples were unaware of the proper treatment

for genital infections, most of whom were homemakers. Also, most women with infections and their spouses had a high school or less than high school degree, which our study results align with. Also, a significant difference between age, job, and education of women and their spouses was found between the two groups. However, in another study, no socioeconomic variables showed a significant difference between the two groups, ectopic and normal pregnancy [16]. This difference might be related to the different research environments and the characteristics of the research participants. Other studies have shown a significant increase in the risk of ectopic pregnancy in 40 years old women and older [17, 18], and our study is consistent with their result.

In the present study, the percentage of marriage age over 35 in ectopic pregnancy group was higher than women with normal pregnancy. Also, a higher percentage of nulliparity, history of abortion and cesarean section was observed in women with ectopic pregnancy than normal pregnancy group. In contrast, the history of infertility in EP group was lower than normal pregnancy. In a similar study [19], the probability of ectopic pregnancy was higher in nulliparous women, which agrees with the present study. However, in some studies, women with higher parity were more likely to have an ectopic pregnancy [20, 21]. The reason for this difference may be the higher probability of ectopic pregnancy in women with a history of infertility, but women with higher parity are less likely to have tube damage, and the probability of ectopic pregnancy is lower in them. That is why there is more ectopic pregnancy in nulliparous women, which requires more precise and detailed studies. In the study of Bouzari et al. [20], no significant statistical relationship was found between ectopic pregnancy and cesarean section history, despite the manipulation and abdominal surgery. However, in the another study, the probability of ectopic pregnancy was 2.1 times higher among women with a history of cesarean section [21]. This difference may be due to different surgical procedures and their possible complications, especially genetic talent for post-operative adhesions. Also, in the study of Bouzari et al. [20], the history of abortion between study groups was not statistically significant. This disagreement with the present study may be due to the correct skill of communicating with the patient for taking a more accurate history.

In the present study, the genital infection type was not investigated. Hence, more studies are required in several centers with larger sample sizes. Also, due to the arbitrary use of drugs by women, failure to notify healthcare workers of such medications, and the importance of paying attention to drug interactions and unknown side effects of these drugs, especially in women

of childbearing age, public education should be provided by the mass media. In addition, specialized training for midwives and doctors of health centers should be planned regarding the arbitrary use of drugs. Appropriate action should also be taken for proper communication and counseling to increase mothers' knowledge about the side effects of self-medication. The effects of self-medication on ectopic pregnancy were examined in the present study. We recommend that the effect of each type of self-medication, chemical or traditional, on ectopic pregnancy should be studied separately.

The results of this study suggest a significant relationship between the self-medication of genital infections and ectopic pregnancy. Therefore, the adequate and correct treatment of genital infections, as a preventive measure, may reduce ectopic pregnancy. In this regard, more studies are required, including future cohort studies.

Ethical Considerations

Compliance with ethical guidelines

This study was conducted after obtaining ethical approval from the Ethics Committee of [Guilan University of Medical Sciences](#) (Code: IR.GUMS.REC.1397.436, date: 2019-02-04), and written consent was taken from all participants.

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Authors' contributions

Study concept and design, and critical revision of the manuscript: Shirin Parvinroo and Seyedeh Hajar Sharami; Data collection: Ariadokht Ardeshiri; Analysis and interpretation of data: Maryam Shakiba; Manuscript draft: Soodabeh Ebrahimi; Final approval of the manuscript: All authors.

Conflict of interest

The authors declared no conflict of interest.

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