

Investigating the Patency of Fallopian Tubes After Clinical and Surgical Treatment of Ectopic Pregnancy

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Article Info

doi: [10.30699/jogcr.9.1.83](https://doi.org/10.30699/jogcr.9.1.83)

Received: 2023/06/23;

Accepted: 2023/11/19;

Published Online: 22 Jan 2024;

Use your device to scan and read the article online



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ABSTRACT

Background & Objective: Ectopic pregnancy (EP) is one of the important issues in the field of obstetrics and gynecology. Proper assessment of fallopian tube patency following medical treatment of an EP in women who wish to have future children seems reasonable. Therefore, the purpose of this study was to investigate the patency of fallopian tubes after clinical and surgical treatment of EP.

Materials & Methods: In this quasi-experimental study, our research population was 270 people who were referred to Ali-Ibn-Abitaleb hospital in Zahedan with a definite diagnosis of EP in 2020. Patients were divided into three groups: drug treatment (90 people), surgical treatment (90 people) and expectant treatment (90 people). For each patient, the patency of the left and right fallopian tubes was investigated and the obtained data were statistically analyzed by t-test and chi-square test methods using SPSS software version 22 (IBM, USA).

Results: A total of 270 patients were examined. The mean age of the patients in the drug treatment, surgical therapy and expectant treatment groups were 32.34 ± 6.17 , 32.02 ± 6.12 and 32.12 ± 6.40 years, ($P=0.389$). Moreover, there was no statistically significant difference between the right fallopian tubes ($P=1.00$), and the left fallopian tubes in the investigated groups ($P=0.08$).

Conclusion: Based on the results of this study, there was no statistically significant difference between the drug treatment and the surgery treatment groups. The findings of this study revealed that the uterine tube opening was similar on both sides after drug treatment, surgical treatment and expectant treatment.

Keywords: Fallopian Tubes, Treatment, Surgery, Ectopic Pregnancy



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Introduction

Ectopic pregnancy (EP) is one of the important issues in the field of obstetrics and gynecology. In some cases, this problem appears as one of the emergencies of this field. After fertilization, the blastocyst naturally settles in the endometrium, covers the uterine cavity. Implantation of a blastocyst anywhere other than the uterus is called ectopic pregnancy (1-4). Misplaced pregnancy is the main problem of women of reproductive age, and its rate is 1.2 to 1.4% of all pregnancies (5, 6). However, the incidence of EP has increased dramatically in recent decades, so that its occurrence rate has been estimated to double in the last 2 years (2, 7).

In the United States, more than one out of every 100 pregnancies are ectopic, and in Germany, the rate of ectopic pregnancy has increased from 0.5% in 1970 to 2% by 2013 (8, 9). But the rate of death and disability related to EP has been decreasing, and the reason for

that is a higher level of awareness and earlier diagnosis (10). However, ectopic pregnancies account for 80% of early pregnancy deaths in England and are responsible for more than 7% of all pregnancy-related deaths in the United States (1, 10). Some risk factors that increase the probability of ectopic pregnancy are included: history of previous ectopic pregnancy, fallopian tube damage after infection or surgery, history of infertility, in vitro fertilization, aging and smoking (11). Ectopic pregnancy is usually associated with symptoms such as amenorrhea, lower abdominal pain, vaginal bleeding, mass in the adnexa and uterine appendages, and in some cases with uterine tube rupture. But usually, in the 6-9th week of pregnancy, a non-specific symptom of lower abdominal pain is diagnosed.

In the past, diagnostic laparoscopy and today, transvaginal ultrasound with high resolution are used for diagnosis (7). Based on ultrasound findings, the

absence of an intrauterine gestational sac with a serum level of human chorionic gonadotropin (β -HCG) higher than the diagnostic limit indicates a high probability of ectopic pregnancy (9).

The treatment of EP depends on the clinical condition of the patient and the desire to preserve fertility in the future (12). In the past, the aim of EP treatment was to reduce the maternal mortality rate, but today this is associated with performing conservative methods with tubal preservation (13). The first choice and standard treatment of EP is laparoscopic surgery, and then laparotomy can also be used (14). But today, medical treatments such as the use of methotrexate (MTX) are of interest due to less damage to the tubes, lower cost, increased hope for fertility, elimination of surgical complications and anesthesia (15). MTX is a chemotherapy drug that inhibits the production of RNA and DNA compounds. Its action is on cells with rapid proliferation, including trophoblast (16). However, this procedure may lead to a residual lesion in the fallopian tube (17). But generally, fertility results for these patients can be evaluated with hysterosalpingography (HSG) (18, 19).

This method is reliable due to its very high sensitivity (0.65) in cases of obstruction detection (20). On the other hand, HSG has a high reproducibility in internal or interstitial (intermediate) observers, especially in the cases of anterior obstructions, it is more visible (21) and in addition, it is a cost-effective method to check uterine tube obstructions (22-24).

The proper assessment of fallopian tube patency following a medical treatment of an EP in women who wish to have future children seems reasonable. Therefore, the purpose of this study was to investigate the patency of fallopian tubes after clinical and surgical treatment of ectopic pregnancy.

Methods

This quasi-experimental study was conducted on 270 women with a definite diagnosis of EP who referred to Ali-Ibn-Abitalib Hospital in Zahedan for hysterosalpingography in the year of 2020. In this study, the number of 270 patients (90 patients in each group) were assessed. The inclusion criteria were: patients with a definite diagnosis of EP, hemodynamic stability, absence of genital infections including vaginitis and cervicitis, etc., patient's insensitivity to the contrast material used in hysterosalpingography, consent to participate in the study and the exclusion

criteria included: patients who were not satisfied with cooperation, patients with not favorable general condition, and history of sensitivity to contrast material.

Patients who were diagnosed by EP gynecologists were divided into three groups (methotrexate treatment, surgical treatment and expectant treatment). The first group includes drug treatment: with a single-dose regimen of 50 mg per square meter of the patient's body (based on the nomogram) and a multiple-dose regimen of 1 mg/kg of methotrexate on days 1, 3, 5, and 7 of hospitalization, the second group includes surgery treatment: salpingectomy (the tube is cut) and salpingostomy (the tube is preserved) and the patency of the same or opposite tube is also checked. And the third group includes expectant treatment: taking into account the serum level of hCG, 1000-1500 iu/l as the limit of EP visibility in vaginal ultrasound, patients without symptoms or with mild symptoms whose hCG level is lower than the above value were administered expectantly and were followed for 48 to 72 hours. In order to check whether the tube is open, the patients were contacted after the passage of at least three months. After the patient's vaginal examination and ensuring the absence of genital infections, including vaginitis and cervicitis, and etc, hysterosalpingography was performed after fully explaining to the patient about the advantages of hysterosalpingography and diagnosing tubal obstruction with this method of hysterosalpingography. Data such as age, ectopic pregnancy (EP), medical treatment of EP, surgical treatment of EP, expectant treatment, and patency of fallopian tubes were recorded in the researcher-made checklist. The SPSS version 24 software was applied for analysis of data using chi-square, independent t-test and Mann-Whitney U test. The significant level was considered less than 0.05.

Results

During the present study, the information of 270 patients with a definite diagnosis of EP was assessed. Of them, 90 patients were allocated to drug treatment group (first group), 90 patients into surgical treatment group (second group) and 90 patients into expectant treatment group (third group). The mean age of the patients in the treatment group was 32.34 ± 6.17 years, in the surgery group was 32.02 ± 6.12 years, and in the expectant group was 32.12 ± 6.40 years ($p=0.389$) (Table 1).

Table 1. Mean age of patients in the studied groups

Group	Mean \pm SD	P-Value
Drug treatment	32.34 ± 6.17	
Surgical treatment	32.02 ± 6.12	0.389
Expectant treatment	32.12 ± 6.40	

The number of patients with open right fallopian tubes in the expectant treatment group in 75 patients (83.33%), in the treatment group was 82.22% and finally in the surgical group was 73.33%. According to the Chi-2 test, there was no statistically significant difference between the right fallopian tubes in the groups ($p=1.000$, $\text{Chi-2}=0.00$, $\text{df}=2$) (Table 2). The

number of patients with open left fallopian tube was observed according to the highest frequency in 77 patients (85.55%) in the treatment group and 71 patients (78.88%) in the surgery and expectant groups. According to the Chi-2 test, there was no statistically significant difference between the left fallopian tubes in the groups ($p=0.08$, $\text{Chi-2}=28.6$, $\text{df}=2$) (Table 3).

Table 2. The frequency of right fallopian tube patency based on selected treatment for the studied patients

Group	Fallopian tube is open.	The right side is closed.	P.Value
Pharmaceutical group	74(82.22%)	16(17.77%)	1.00
Surgery group	66(73.33%)	25(27.77%)	
waiting group	75(83.33%)	15(16.66%)	

Table 3. The frequency of left fallopian tube patency based on the selected treatment for the studied patients

Group	Fallopian tube is open.	The left side is closed	P.Value
Pharmaceutical group	77(77.77%)	13(14.44%)	0.08
Surgery group	71(78.88%)	19(21.11%)	
waiting group	71(78.88%)	19(21.11%)	

Discussion

Ectopic pregnancy (EP) is one of the important issues in the field of obstetrics and gynecology. In our study, there was no statistically significant difference between the age of patients in different treatment groups. In the study of Chiu, Ho (25) no significant statistical association was observed between the age of patients and EP, which was consistent with our study (25). In our study, in the treatment group, the mean age of the patients was 32.34 ± 6.17 years, and in 74 patients, the right fallopian tube was open and in 77 patients, the left fallopian tube was open. In this group, 5 patients (5.55%) were blocked on both sides of their fallopian tubes. No statistically significant correlation was observed between uterine tube opening on both sides and ectopic pregnancy. In Fakheri, Farshchian (26) study, there was a statistically significant difference between uterine tube patency and MTX drug treatment, which was in contrary to our study (26).

In our study in the surgery group, the mean age of the patients was 32.02 ± 6.12 years, 66 patients (73.33%) had right fallopian tubes and 71 patients (78.88%) had left fallopian tubes. In this group of patients, 6 patients (6.66%) were observed on both sides of the obstruction. In our study, surgery had the least effect in completely opening the tubes without damaging them. Similar results were obtained in Junior et al.'s study.

In the expectant treatment group, the mean age of patients was 31.21 ± 6.40 years, in 75 patients (83.33%) the right fallopian tube was open and in 71 patients (78.88%) the left fallopian tube was open. In this group of patients, 7 patients (7.77%) had

obstruction on both sides. According to our study, expectant treatment patients had more than other groups with bilateral obstruction in fallopian tubes.

In our study, 67.03% of the patients were without obstruction, while in Garcia's study, 72.2% of the patients were without obstruction. 26.29% of patients had unilateral obstruction and 6.6% of patients had bilateral obstruction. In Garcia Grau, Checa Vizcaíno (20) study, 18.8% of patients had unilateral obstruction and 2.8% of patients had bilateral obstruction, which is less bad than our study (20).

In Elito Junior, Han and Camano (24) study, 97% of fallopian tubes were opened after MTX treatment, 92% after expectant treatment and 83% after surgical treatment. These results were in line with our study regarding the treatment effect on fallopian tube opening. In our study, there was no statistically significant between the treatment group and surgery, which was in line with the results of Julio and Makaran's study (24).

Conclusion

Based on the results of this study, there was no statistically significant difference between the treatment and surgery groups. The findings of this study revealed that the uterine tube opening was similar on both sides after drug treatment, surgical treatment and expectant treatment.

Acknowledgments

We acknowledge Deputy of Research and Technology, Zahedan University of Medical Sciences for financial support of the study.

Conflict of Interest

The authors declare that they have no any conflict of interest.

Funding

None.

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How to Cite This Article:

Hosseinabadi, F., Noori, N., Ghasemi, M., Bitaghsir Fadafan, M., Ayubi, E. Investigating the Patency of Fallopian Tubes After Clinical and Surgical Treatment of Ectopic Pregnancy. *J Obstet Gynecol Cancer Res.* 2024; 9(1):83-7.

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