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Hysterosalpingographic evaluation following management of ectopic pregnancy

Hysterosalpingografické vyšetření po léčbě mimoděložního těhotenství

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Summary: Objective: It is to assess the ipsilateral and contralateral tubal patency by hysterosalpingography following salpingostomy and methotrexate therapy for tubal pregnancy. **Patients and methods:** The study was conducted between September 2021 and October 2023. It was conducted in the radiodiagnosis and obstetrics and gynecology departments of the Al-Hussin and Al-Azher university hospitals. Patients who had undergone salpingostomy or received methotrexate treatment were included in this research. Three months after being discharged, the individuals who were seeking for fertility were assessed again for Fallopian tube patency using hysterosalpingographs. Two groups of women participated in the study: group I (N = 50) received methotrexate treatment, while group II (N = 50) had undergone salpingostomy management. **Results:** The two groups (medical and surgery) did not vary statistically significantly in preserving tubal patency. Following methotrexate therapy, the ipsilateral tubal patency was 72%, and following surgical management, it was 74%. Furthermore, following methotrexate therapy, contralateral tubal patency was 92%, and 90% following salpingostomy. **Conclusion:** The results point to comparable success rates with salpingostomy and methotrexate in preserving fallopian tube patency.

Key words: hysterosalpingography – ectopic pregnancy – methotrexate – infertility – salpingostomy

Souhrn: Cíl: Posoudit ipsilaterální a kontralaterální průchodnost vejcovodů pomocí hysterosalpingografie po salpingostomii a léčbě metotrexátem u tubárního těhotenství. **Pacientky a metody:** Studie byla provedena v období od září 2021 do října 2023. Probíhala na radiologickém a gynekologicko-porodnickém oddělení univerzitních nemocnic Al-Hussin a Al-Azher. Do studie byly zařazeny pacientky, které podstoupily salpingostomii nebo léčbu metotrexátem. Za 3 měsíce po propuštění z nemocnice byly pacientky, které se snažily otěhotnět, znovu vyšetřeny pomocí hysterosalpingografie. Studie se zúčastnily dvě skupiny žen: skupina I (n = 50) podstoupila léčbu metotrexátem, zatímco skupina II (n = 50) podstoupila salpingostomii. **Výsledky:** Mezi oběma skupinami (léčba medikamenty a chirurgický zákrok) nebyl statisticky významný rozdíl v zachování průchodnosti vejcovodů. Po léčbě metotrexátem byla ipsilaterální průchodnost vejcovodů 72 % a po chirurgickém zákroku 74 %. Kromě toho byla po léčbě metotrexátem průchodnost kontralaterálního vejcovodu 92 % a po salpingostomii 90 %. **Závěr:** Výsledky ukazují srovnatelnou úspěšnost salpingostomie a metotrexátu v zachování průchodnosti vejcovodů.

Klíčová slova: hysterosalpingografie – mimoděložní těhotenství – metotrexát – neplodnost – salpingostomie

Introduction

The term "ectopic pregnancy" (EP) refers to implantation of the conceptus outside the normal uterine cavity. Fallopian tube accounts for 95.5% of all implantation sites, with ovarian (3.2%) and abdominal (1.3%) sites following closely behind. Early pregnancy deaths in the world are primarily caused by EP. Studies have shown that case fatality rates (1–3%) from EP were 10-times greater in underdeveloped African nations than they were in wealthy nations [1].

Methotrexate is a folic acid antagonist used in chemotherapy that combines with the enzyme tetrahydrofolate reductase to produce an antimetabolite effect. It prevents the synthesis of pyrimidine and purine bases, which are necessary for the synthesis of DNA and RNA. It works on cells that replicate quickly, such as pregnancy's trophoblastic cells. For EP, systemic methotrexate is a secure and efficient therapy. Methotrexate is less intrusive, less expensive, and avoids anaesthesia as compared to surgery. In cases of ectopic pregnancy, methotrexate has helped to reduce the disease burden by providing a nonsurgical, fertility-preserving treatment option for about 25% of women [2].

We conducted this study to fill the data gap and provide an overview

Tab. 1. Comparison between the two studied groups as regards demographic data and the tubal patency (ipsilateral and contralateral tubes) after treatment (outcome).
Tab. 1. Srovnání mezi dvěma studovanými skupinami z hlediska demografických údajů a průchodnosti vejcovodů (ipsilaterální a kontralaterální vejcovody) po léčbě (výsledek).

	Group I (N = 50)	Group II (N = 50)	P
Age	32.7 ± 2.8	32.6 ± 2.1	0.8403
Parity	1.8 ± 0.8	1.6 ± 0.7	0.1865
Smoking	17	19	**0.676922**
Occupation employee house wife	 12 38	 14 36	**0.648418**
Previous PID	5	4	**0.726768**
Previous pelvic operations	3	3	**1**
Previous septic miscarriage	3	2	**0.646355**
History of infertility	12	11	**0.812173**
Ipsilateral tubal patency (%)	36 (72)	37 (74) 45 (90)	**0.875148**

N – number/počet, P – value/hodnota, PID – pelvic inflammatory disease/zánětlivé onemocnění pánve

Tab. 2. Comparison between rates of ipsilateral tubal occlusion among cases in group I as regards the number of doses of methotrexate.
Tab. 2. Srovnání míry ipsilaterální tubární okluze u případů ve skupině I s ohledem na počet dávek methotrexátu.

	Single dose (N = 39)	Mutliple doses (N = 11)	P
Patency	29	7	**0.484228**
Occulsion	10	4	

N – number/počet, P – value/hodnota

Tab. 3. Comparison between rate of patency in the ipsilateral and contralteral tubes in group II as regards the method of salpingiostomy.
Tab. 3. Srovnání míry průchodnosti ipsilaterálních a kontralaterálních vejcovodů ve skupině II z hlediska metody salpingiostomie.

	Laparoscopy (N = 40)	Laparotomy (N = 10)	P
Ipsilateral tubal patency	30	7	**0.490756**
Contralateral tubal patency	39	6	

N – number/počet, P – value/hodnota

of tubal patency after using medical treatment for ectopic pregnancy instead of surgical methods. Variable results are present regarding tubal patency after methotrexate treatment of unruptured ectopic pregnancy, with lacking published studies held in Egypt.

Patients and methods

Over the course of two years, women receiving either salpingostomy or methotrexate treatment were included in the research. The study was conducted between September 2021 and October 2023. It was conducted in the radiodiagnosis and obstetrics and gynecology departments of the Al-Hussin and Al-Azher university hospitals. Three months after being discharged, hysterosalpingography (HSG) reevaluated the fallopian tube patency of the individuals seeking fertility. Two groups of women participated in the study: group I (N = 50) received methotrexate treatment, while group II (N = 50) received salpingostomy treatment.

Patients with a diagnosis of tubal pregnancy who are treated with salpingostomy or methotrexate alone, without a history of pelvic infections within three months of therapy, or who have had no laparotomy, are eligible for inclusion. HSG was performed using balloon-tipped catheters while being seen fluoroscopically. If the dye did not appear to leak out the tubal end, an anomaly was noted.

Statistical analysis

SPSS for Windows 20.0 must be used for analysis. For numerical parametric variables, data should be displayed as range, mean, and standard deviation; for numerical non-parametric variables, range, median, and interquartile range; and for categorical variables, number and percentage. The mean difference and its 95% CI can be used to evaluate the difference between two independent groups. The two groups were compared using the T-test and the Chi-squared test. Significant results were defined as $P < 0.05$ and very significant results as $P < 0.001$.

Results

Fifty cases were treated by methotrexate (group I) while 50 were managed surgically by salpingostomy (group II) (Tab. 1–3).

Discussion

In our study, group I treated with methotrexate, had a mean age of 32.7 years (± 2.8 standard deviation – SD) and a mean parity of 1.8 (± 0.8 SD). In contrast, group II, treated with surgery, had

a mean age of 32.6 years (± 2.1 SD) and a mean parity of 1.6 (± 0.7 SD). In terms of mean age and mean parity, smoking, occupation, previous pelvic inflammatory disease (PID), previous septic miscarriage, previous pelvic operations and history of infertility, there was no statistically significant difference between the two groups under investigation (Tab. 1).

According to the current study, 28% of patients had ipsilateral obstructed tubes and 72% of patients had patent tubes in group I and 26% and 74% resp. in group II. Additionally, 8% of patients had a contralateral tubal block in group I and 10% in group II. This may be because methotrexate (MTX) treatment kills cells that proliferate quickly, such as trophoblastic cells, leaving behind lesion or tissue remains in the Fallopian tube that have the potential to obstruct the tube. Additionally, the inflammatory response at the implantation site may cause intratubal adhesions that impair tubal patency, which would account for the frequency of ipsilateral tubal block. On the other hand, a contralateral tubal block may result from a tubal illness that developed before to the present pregnancy, such as PID, salpingitis, or prior surgery.

The results of this trial were in line with those of a previously published one, in which methotrexate therapy increased ipsilateral tube patency to 84% and contralateral tubal patency to 97% [3]. According to earlier studies, women using methotrexate had a general ipsilateral tubal patency percentage of 66.7% (26/39) [4].

Higher rates of tubal patency (97.5%) following combination systemic and local methotrexate treatment were found in a previous research. Different treatment approaches account for this variation in outcome [5].

9/100 of participants in the current research experienced hydrosalpinx. These results were in line with the previously cited study, which showed that 9 (6.3%) of the patients had tubal patency but with a non-obstructive hydrosalpinx defect [6]. Moreover, 5% of participants had septic miscarriages. 17% of patients reported having had prior pelvic surgery. No patient reported having had an ectopic pregnancy in the past.

The two groups' ectopic pregnancy risk variables were contrasted. In terms of prior PID or laparotomy, the two groups were contrasted. Although group II has a larger proportion of PID than group I, the statistical difference is not statistically significant. Although group II had more laparotomies than group I, the statistical difference is not statistically significant. The prior history of infertility for the two groups was compared. Group I has a higher percentage of infertility than Group I, however the statistical difference is not statistically significant (Tab. 1).

Between the two groups, the ipsilateral tube's patency was evaluated. Between the two groups under investigation, there is no statistically significant variation in the frequencies of tubal patency and occlusion following therapy. Up to 72% of tubal patency patients treated with parenteral MTX were found in systematic evaluations covering. Methotrexate treatment administered once at a dosage of 50 mg/M2 of surface area is used to treat. Additionally, Stoval reported that 82.6% of patients receiving methotrexate had ipsilateral tubal patency. Human chorionic gonadotropin (hCG) levels dropped quickly following surgery in a small randomised trial comparing linear salpingostomy with ultrasound-guided intratubal methotrexate injection, showing comparable success rates and tubal patency [7].

Comparable tubal patency of 90% and 92%, resp., were found by Hajenius et al. in patients treated with linear salpingostomy and those undergoing a single dose of methotrexate [8]. Additionally, comparable trials like Guven et al. [9] and Elito et al. [10] reported tubal patency rates of 84% and 83.9%, resp. As to the findings of the 2004 study by Fujishita et al., 90% of salpingostomies without tubal suturing and 94% of salpingostomies with tubal suturing had tubal patency [11].

According to Colacurci et al., bilateral tubal patency was found in 60% of cases and 90% of cases if hCG was greater than 10,000 U/L [12]. The percentages of ipsilateral tubal patency following salpingostomy were 68%, 64%, and 80%, resp., in many researches [13–15]. In a related research, Olofsson et al. found comparable patency rates following surgery and methotrexate [16].

The contralateral tube was evaluated in the two groups, and although the rate of blockage is lesser among those receiving medical therapy, the statistical difference is not statistically significant. The contralateral tube had a 56.7% patency rate in the Guven et al. study [9]. A similar 81.5% of findings were obtained by Langer et al. in 1990 [17].

It was determined how often instances in group I had blockage in relation to the quantity of methotrexate dosages. More patent tubes were found in cases involving a single dose, and the statistical difference was not significant. This is inconsistent with the findings of Guven et al., who reported that tubal patency following a single dose of methotrexate was 83.9%, while tubal patency following multiple doses of methotrexate was 56.7%. Additionally, he stated that multiple doses of methotrexate had a detrimental effect on tubal patency [9].

In group II, the rate of occlusion in the afflicted and contralateral tubes is evaluated in relation to the salpingostomy route. Greater risk of occlusion in instances involving laparotomies, however statistically there is no difference. This is consistent with Vermesh et al., who found no discernible difference between the two groups' tubal patency rates of 89% following laparoscopy and 80% following laparotomy [15]. On the other hand, compared to traditional conservative surgery, laparoscopic treatment of ectopic pregnancy leads in less deterioration of the pelvic state [18].

Conclusion

As a result, there was no discernible variation in the groups' ipsilateral and contralateral tube patency. These findings demonstrate that the effects of surgery (salpingectomy) and therapeutic therapy (MTX or expectant management) on tubal patency are identical.

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