Tubal Patency and Pregnancy Rate Following Surgical and Medical Treatments of Ectopic Pregnancy

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Abstract

background: Ectopic pregnancy is defined as the implantation of a fertilized ovum outside the endometrial cavity, most commonly in the fallopian tubes. The high incidence of ectopic pregnancies can to some extent be related to the fact that the early diagnosis of pregnancy can be made with the use of β-hCG and ultrasound scans to identify the location of an early pregnancy.

objectives: current study was conducted to (1) assess tubal patency by using hysterosalpingography following surgical and medical treatments of tubal pregnancy, and 92) to assess pregnancy rates following surgery and medical treatment of patients with ectopic pregnancy. Methods: an interventional controoled clinical study involved 300 women diagnosed with ectopic pregnancy at Bint-Alhuda Teaching Hospital in Thi-Qar Governorate, Iraq. They were divided into two groups according to the patients' preference; the first group treated with methotrexate while the second group treated surgically. Hysterosalpingography was done to all patients in both groups after three months of treatment, and both groups were followed up for one year waiting for pregnancy. Results: Tubal patency and spontaneous pregnancy rate is higher in the medically-treated group of patients. The contralateral tubal blockage was 11.5% in surgical-treated group, while 5.85% in medical-treated group. The spontaneous pregnancy rate was higher in medical-treated group (81.81%), while (58.66%) in the surgical-treated group. Conclusions: Better fertility potential and hysterosalpingography findings have been found after the medical treatment for patients with tubal ectopic pregnancy than those who are treated surgically.

***Keywords**: ectopic pregnancy, medical, surgical, tubal patency, hysterosalpingography.*

to control the vascular pedicles during radical cystectomy and demonstrated a significant decrease in the intraoperative and postoperative blood loss and decrease in the time of operation. [(18)]

Chang et al demonstrated significantly decreased blood loss and the transfusion requirement during radical cystectomy using stapling device.[(19)] Mandhani et al adopted several technical modifications to open radical cystectomy which included Pfannenstiel incision, internal splint, single urethral catheter and extraperitonealization of the orthotopic neobladder and demonstrated that with these modifications the advantages of minimally invasive surgery may be obtained, like early recovery, less need for analgesics, better cosmesis and reduction in length of hospitalization.[(20)]

In the present study the use of ligasure as hemostasis maneuver resulted in significant advantages compared to the use of conventional ligature technique including decreased operative time and better hemostasis as reflected by less amount of blood loss, less need for blood transfusion and fewer number of blood units transfused. Manasia *et al* demonstrated similar results to the present study where they found the use of ligasure was safe and effective in decreasing blood loss and saving the time of surgery.[(21)]

The complications of surgery reported in the present study were comparable in both groups with no significant difference in incidence of complications, so the use of

appearance of late complications may increase with increased period of follow up.

Introduction

Ectopic pregnancy is defined as the implantation of a fertilized ovum outside the endometrial cavity, most commonly in the fallopian tubes [1]. The incidence of ectopic pregnancy in UK is 11/1000 pregnancies and the

mortality rate is about 10/100000. The high incidence of ectopic pregnancies can to some extent be related to the fact that the early diagnosis of pregnancy can be made with the use of β-hCG and ultrasound scans to identify the location of an early pregnancy [2].

Hospital during the period from February 2009 to February 2016. Informed consents were obtained from all participating women prior to the study.

During that period 300 women were diagnosed with unruptured ectopic pregnancies were enrolled in this study. The diagnosis was based on 1. Clinical history and physical examination, 2. Measurement of β-hCG level and

3. Ultrasound scans.

The exclusion criteria were:

1. Haemodynamically unstable patients with suspected ruptured ectopic pregnancy,
2. Previous history of ectopic pregnancy,
3. Patients who had completed family and not planning for further pregnancy and
4. Unable to continue with the follow-up visits.

The indications for medical therapy were:

1. No significant pain,
2. Serum β-hCG level is less than 5000 IU/L,
3. Ultrasound shows unruptured ectopic pregnancy measuring less than 4 cm and with no visible fetal heart beats,
4. No intrauterine pregnancy (heterotopic pregnancy) and
5. Methotrexate is an acceptable option (patient acceptance).

On the other hand, contraindications to medical treatment were:

1. Chronic liver, renal, or hematological disease,
2. Active infection,
3. Immunodeficiency and
4. Breast feeding.

The clinical assessment, involved detailed history and thorough clinical examination, was performed for each patient. The patients were investigated for complete blood count, random blood glucose, liver and renal function tests, β-hCG level and pelvic ultrasonography.

In the first group of patients, who selected surgical treatment, laparotomy was done with salpingectomy of the affected tube, treated as inpatients for 48 hours and then discharged.

In the second group of patients, who selected medical treatment with methotrexate, on day zero, β-hCG level was measured, pelvic U/S was performed and methotrexate injection (Methotrexate *Ebewe*® 10mg/ml solution for injection) as a single intramuscular dose (50 mg) was given. If the patient lived nearby hospital (less than 15 minutes to reach the hospital) and has support at home, she would be discharged and asked to come back after 4 days; otherwise she was treated as an inpatient.

On day four, β-hCG level was measured, pelvic U/S was performed and another dose of methotrexate injection given if the decrease in β-hCG level was less than 15% from baseline.

On day seven, β-hCG level was measured, pelvic U/S was performed to confirm the success of treatment. If any patient developed treatment failure (demonstrated by persistent symptoms, persistent high β-hCG level, ruptured ectopic by U/S or clinically unstable), the patient referred to surgery.ccordingly, 10 patients were referred and excluded from the study.

All patients who were rhesus negative, from both groups, received anti-D injection. Also patients of both groups advised to avoid pregnancy for the next three months by using ordinary contraceptive methods and were asked to return for follow-up. After three months of treatment, hysterosalpingography was done for all patients. Then they were re-examined at 6 and 12 months intervals to look for spontaneous pregnancy. Data of this study were statistically analyzed using Chi-square test.

Result

During the period of study, populations of 300 participants from both groups. The proportions of both women were included. Out of these patients, 260 women groups seemed approximately similar regarding age, completed the study while 40 women were excluded parity, surgical history and history of infertility. because they did not attend follow-up visits.

Table (1) shows demographic characteristics of

Table 1: demographic characteristics of participants

no.	Parameters	Frequency (Surgical treatment)	%	Frequency (Medical treatment)	%
1.	**Age (years):**				
	(20 – 30)	90	34.6	69	26.5
	> 30	60	23	41	15.7
2.	**Parity:**				
	Primi	38	14.6	20	7.7
	Multi	112	43	90	3.4
3.	**Surgical history:**				
	Yes	78	30	54	20.7
	No	72	27.7	56	21.5
4.	**history of infertility:**				
	Yes	58	22.3	38	14.6
	No	92	35.3	72	27.7

Numbers and proportions of patients who received medical treatment (110; 42.3%) and those treated surgically (150; 57.7%) are presented in Table 1 1.

Table 2: numbers and proportions of patients who were treated medically and those treated surgically

Study Groups	Frequency	%
Medical treatment	110	42.3
Surgical treatment	150	57.7
Total	260	100.0

Numbers and proportions surgically-treated patients with patent contralateral tube (120 patien; 46.2%), and those with non-patent contralateral tube (30 patients; 11.5%) are presented in Table 3.

Table 3: numbers and proportions of surgicallytreated patients according to patency or nonpatency of contralateral tube

Contralateral tube		Frequency	%
Valid	Patent tube	120	46.2
	Non-Patent tube	30	11.5
	Total	150	57.7
Missing	System	110	42.3
Total		260	100.0

Numbers and proportions of medically-treated patients with patent contralateral tube (15; 5.8%) and those with non-patent contralateral tube (95; 36.5%) according to hysterosalpingography examination are shown in Table 4.

Table 4: numbers and proportions of medicallytreated patients according to patency or nonpatency of contralateral tube

Contralateral		Frequency	Percent	Valid Percent
Valid	Patent tube	95	36.5	86.4
	Non-Patent tube	15	5.8	13.6
	Total	110	42.3	100.0
Missing	System	150	57.7	
Total		260	100.0	

The results of patency of the affected tube by ectopic pregnancy (ipsilateral tube) in the medical-treated group (78 patients with patent tube; 70.9%) while 32 patients (29.1%) were with non-patent tube are presented in Table 5.

Table 5: Results of patency of the affected tube by ectopic pregnancy (ipsilateral tube) in the medicallytreated group

Ipsilateral tube	Frequency	%	Valid Percent	Cumulative Percent
Patent tube	78	70.9	70.9	70.9
Non-Patent tube	32	29.1	29.1	100.0
Total	110	100.0	100.0	

Numbers and percentages of spontaneous pregnancies after medical (90 patients; 81.81%) and after surgical (88 patients; 58.66%) treatments are presented in Table 6.

Table 6: numbers and percentages of spontaneous pregnancies after medical and surgical treatments

Study groups (no.)	number of spontaneous pregnancies (%)
Surgical treatment (150)	88 (58.66)
Medical treatment (110)	90 (81.1%)

discussion

Ectopic pregnancy is one of the major health problems and an important cause of morbidity and mortality in women of reproductive age [3]. Better clinical care should help prevent the avoidable mortality and also reduce physical and psychological morbidities associated with ectopic pregnancy, improve future fertility outcomes and reduce the costs associated with repeated hospital admissions [5,6].

The increasing sensitivity of our diagnostic tests for ectopic pregnancies has resulted in many cases being diagnosed earlier in their natural course and led to clinically stable patients. Those patients are usually hesitating to accept surgery with its complications and salpingectomy with its psychological burde,ns and the possible adverse effects of subsequent fertility potential. So, the role of medical treatment is increasing and its popularity is growing, especially at our center after the completion of this study as it had no or very limited role before that.

In this study, there was good patients' acceptance of medical treatment as 110 patients (42.3%) out of 300 patients did accept medical treatment while 150 patients (57.7%) preferred surgical treatment (Table 2).

Good compliance with follow-up has been seen for 260 patients out of 300 patients in this study, because most women took future fertility problems more seriously. Medical treatment was commonly safe with no demonstrable harms or serious side effects.

High success rate was achieved in current study using medical treatment due to good selection of patients (failure rate was low as only 10 patients needed surgery after the failure of medical treatment and they were excluded from the study).

When we compare the tubal patency of both groups (using hysterosalpingography) and compare the patency of contralateral tube (non-affected side by ectopic), we found that tubal blockage was 11.5% in the surgical treatment group (Table 3) while 5.8% in the medical treatment group (Table 4). Therefore, surgical treatment is considered more risky for adhesion formation than medical therapy. However, it was difficult for us to assess if this blockage may proceed with our treatment or not.

In the surgical group, we did salpingectomy so the affected tube was lost (i.e. 100% blockade of ipsilateral affected tube, in another word the patient lost 50% of her fertility potential. However, in the medical treatment group, 70.9% had patent ipsilateral tube (affected tube by ectopic) so its function can be preserved although could be a site of future ectopic (Table 5). Therefore, we need more accurate and sophisticated tests to prove its functional potential.

The spontaneous pregnancy rate was higher in medically-treated group (81.81%) versus (58.66%) in the surgically-treated patients (Table 6). This might be related to the patent ipsilateral tube.

Therefore, the medical treatment is safe, highly effective in the properly selected patients with better subsequent fertility and free of surgical complications with wide acceptance in our center. Hence, it should take a greater role and should be used as a first line treatment in selected patients and this is supported by special guidelines. The guidelines staes that methotrexate should be used as a first line treatment if β-hCG level is less than 1500 IU/L, however, women with β-hCG levels between 1500 –5000 IU/L may be offered either surgical or methotrexate treatment [7,8].

Conclusions and Recommendations

The present study demonstrated that a better fertility potential and hysterosalpingography outcomes were achieved after methotrexate treatment for ectopic tubal patency than surgical treatment.

Further studies should be performed including larger patient populations, probably multi-centre studies, and more investigation facilities like laparoscopy for assessing fertility state and tubal condition.

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Conflict of Interest: None to declare.

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