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Original research article

COMPARATIVE ANALYSIS OF MEDICAL AND SURGICAL MANAGEMENT OF ECTOPIC PREGNANCY

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Abstract: *A pregnancy that occurs in any place other than the endometrial cavity is called ectopic pregnancy.* ***Objectives:*** *The main aim of the study is to find a comparative analysis of medical and surgical management of ectopic pregnancy.* ***Methods:*** *This retrospective study was conducted at Hospital Civil/SPH Quetta. from January 2023 to December 2023. Data was collected from 220 patients. Comprehensive clinical and demographic data were extracted from electronic medical records. These included patient age, gravidity, parity, gestational age at diagnosis, presenting symptoms, imaging results, serum β-hCG levels, treatment modalities utilised, procedural specifics, and post-intervention outcomes.* ***Results:*** *Data were collected from 220 patients suffering from ectopic pregnancies. The mean age of patients in the medical management group was 29.2±4.3 years, and 29.8±4.1 years in the surgical management group. Nulligravid patients were more prevalent in the medical management group (58%) compared to the surgical management group (45%), while multigravida patients were more evenly distributed between the two groups (42% vs. 55%). In comparing medical and surgical management of ectopic pregnancy, surgical management demonstrated a higher success rate (95%) compared to medical management (85%). Medical management with methotrexate typically resolved ectopic pregnancies within an average of 17 days, whereas surgical interventions varied in time to resolution. However, surgical management had a slightly higher complication rate (12%) than medical management (10%).* ***Conclusion:*** *It is concluded that both medical and surgical management options demonstrate high efficacy in resolving ectopic pregnancy, with considerations for individual patient characteristics and clinical presentations.*

Keywords: Ectopic Pregnancy, Methotrexate / therapeutic use, Laparoscopy/methods, Treatment Outcome

Introduction

A pregnancy that occurs in any place other than the endometrial cavity is called ectopic pregnancy. The incidence of ectopic pregnancy in developed countries has increased by 2% recently. Ectopic pregnancy is the most prevalent cause of mortality in pregnant women during their first trimester (1). It is responsible for 10% of all mortality during pregnancy. The treatment for ectopic pregnancy can have a significant effect on the health and future fertility of the patients. For a long time, surgical treatment has been the standard treatment for ectopic pregnancy (2). Though ectopic pregnancy still stands as a severe issue in obstetrics, it has both the diagnostic and treatment components that require consideration. Ectopic pregnancy is the process of the fertilised egg that gets implanted in some area outside the uterus line, usually within the fallopian tubes (3). If it continues, it can lead to life-threatening complications unless diagnosed and treated in due time. Apart from the progress of medical, surgical and diagnostic techniques, clinicians now have an extensive palette of options for managing this condition, each with its advantages and disadvantages (4). The risk factors are the previous surgery of the tubes, abnormal menstruation in the genital organ, previous reproductive technologies, smoking, age, which is over 40 years, IUD, only the OC with progestin, multi-parity and earlier abortion (5). Embryo fixation determines the clinical symptoms in ectopic pregnancy, and such factors as localisation of pregnancy are taken into consideration (6). The fallopian tube, on the one hand, displays itself as the most common region of ectopic implantation with 97% of all ectopic cases. It is estimated that about 80% per cent of all ectopic pregnancies usually occur in the uterine tubal ampulla, 12% in the uterine isthmic part, 5% in the corneas and 2% in other parts not. Besides, localisations other than the liver are too rare as usual; they can make up 1%, and the most common are cervical, ovarian, and abdominal cancers (7). The clinical manifestations of ectopic pregnancy that are very wide in scope, from not having any to acute abdominal pain and shock, might pose a challenge in diagnosis (8). ACombination of β-hCG and rotation trans-vaginal ultrasound give 97% of the sensitivity and 95% of the specificity and exclude the usage of the more invasive methods like D & C. The classic clinical triad is dysmenorrhea, amenorrhea and vaginal blood. A rise of β-hCG with an average level of 66% indicates normal intra-uterine pregnancy within 48 hours (9). Thus, the main objective of the study is to find a comparative analysis of the medical and surgical management of ectopic pregnancy.

Methodology

This retrospective study was conducted at Hospital Civil/SPH Quetta. from January 2023 to December 2023. Data were collected from 220 patients. Patients of

reproductive age with confirmed ectopic pregnancy based on clinical assessment, ultrasound findings, and serum β-human chorionic gonadotropin (β-hCG) levels were included in the study. Patients with coexisting medical conditions or prior surgical interventions impacting fertility were excluded. Comprehensive clinical and demographic data were extracted from electronic medical records. These included patient age, gravidity, parity, gestational age at diagnosis, presenting symptoms, imaging results, serum β-hCG levels, treatment modalities utilised, procedural specifics, and post-intervention outcomes. Throughout the data collection process, utmost attention was given to patient anonymity and confidentiality, with all information securely stored and accessible only to authorised personnel. Data were then analysed using SPSS v29.0. Descriptive statistics were employed to summarise patient demographics, clinical characteristics, and treatment modalities. Comparative analyses between the medical and surgical management groups were conducted using a t-test

Results

Data were collected from 220 patients suffering from ectopic pregnancies. The mean age of patients in the medical management group was 29.2±4.3 years, and 29.8±4.1 years in the surgical management group. Nulligravid patients were more prevalent in the medical management group (58%) compared to the surgical management group (45%), while multigravid patients were more evenly distributed between the two groups (42% vs. 55%). Similarly, a higher proportion of nulliparous patients was observed in the medical management group (63%) compared to the surgical management group (60%). Gestational ages at diagnosis were comparable between the two groups (7.0 ± 1.4 weeks vs. 7.4 ± 1.6 weeks). The most common presenting symptom in both groups was abdominal pain, reported by 92% of patients in the medical management group and 90% in the surgical management group. Vaginal bleeding was also prevalent, with 79% and 75% of patients presenting with this symptom in the medical and surgical management groups, respectively (Table1).

Table 1: Demographic data of patients

Characteristic	Medical Management (n=120)	Surgical Management (n=100)
Mean Age (years)	29.2±4.3	29.8±4.1
Gravidity		
- Nulligravid	70 (58%)	45 (45%)
- Multigravid	50 (42%)	55 (55%)
Parity		
- Nulliparous	75 (63%)	60 (60%)
- Multiparous	45 (37%)	40 (40%)
Gestational Age (weeks)	7.0±1.4	7.4±1.6
Presenting Symptoms		
- Abdominal Pain	110 (92%)	90 (90%)
- Vaginal Bleeding	95 (79%)	75 (75%)
- Shoulder Tip Pain	25 (21%)	20 (20%)

Medical management with methotrexate exhibited a complication rate of 10%, while surgical management had a slightly higher complication rate of 12%. Among surgical interventions, laparoscopic salpingectomy had the highest complication rate at 15%, followed by salpingostomy at 10%. Conservative management, despite being associated with the lowest complication rate at 5%, had a higher incidence of subsequent ectopic pregnancy at 8% (Table 2).

Table 02: Complications and long-term outcomes

Treatment Modality	Complication Rate (%)	Subsequent Ectopic Pregnancy (%)
Medical Management with Methotrexate	10	5
Surgical Management	12	3
- Laparoscopic Salpingectomy	15	2
- Salpingostomy	10	4
- Conservative Management	5	8

In comparing medical and surgical management of ectopic pregnancy, surgical management demonstrated a higher success rate (95%) compared to medical management (85%). Medical management with methotrexate typically resolved ectopic pregnancies within an average of 17 days, whereas surgical interventions varied in time to resolution. However, surgical management had a slightly higher complication rate (12%) than medical management (10%). Despite this, patients undergoing medical management experienced shorter hospital stays (1.8 ± 0.8 days) than surgical management (2.5 ± 1.0 days).

Table 3: Comparative analysis of medical and surgical management

Aspect	Medical Management	Surgical Management
Success Rate (%)	85	95
Mean Time to Resolution (days)	17	-
Complication Rate (%)	10	12

Mean Hospital Stay (days)	1.8± 0.8	2.5±1.0
Long-Term Fertility Outcomes (%)		
	Conception within 1 Year: 60	Conception within 1 Year: 65
	Subsequent Ectopic Pregnancy: 5	Subsequent Ectopic Pregnancy: 3

Discussion

The success of the two medical and surgical management methods is quite substantive. The findings of the study will equally reveal high success rates in the resolution of pregnancy as with ongoing pregnancy or miscarriage (10). The results of our research confidently support the findings of other cited studies, which have proved the high efficacy of the combined medical and surgical management of ectopic pregnancy. Several trials have been done, and it has been established as a safer and more effective method in selective patients, mainly those with stable hemodynamics values, low serum bhCG levels and no case of tubal rupture (11). The gold standard for the treatment of ectopic pregnancy remains the surgical intervention, such as laparoscopic salpingectomy, salpingostomy in case of severe conditions, like hemodynamic instability and tubal rupture and in cases with unsuccessful medical treatment (12).

This study's conclusion won't only affect the medical management of ectopic pregnancy in the clinical sphere but might cause other effects as well. A clinician should be able to weigh the different characteristics, preferences, and manifestations by selecting an adequate treatment (13). In a medical strategy, stable patients with early ectopic pregnancies and low serum β-hCG are the first option. In contrast, the surgical approach in cases of ruptured fallopian tubes or hemodynamic instability is the choice. We must aim at well-defined drawbacks along with the advantages when providing the study results (14). In other words, being a retrospective analysis, the research is inevitably accompanied by potential biases like selection bias and incomplete data capture. Indeed, the contents of the study stem from a single centre, which to some extent may affect the acceptability of its implications as a way forward for other healthcare environments (15). Also, since the study period was not extendable, the data regarding follow-up was restricted for years beyond the study duration. This led to an incomplete assessment of the outcomes, such as fertility and other reproduction functions (16). Further research consisting of multi-centre prospective studies should be carried out to corroborate and elaborate the results of our research and assess the comparative effectiveness of different treatment modalities, such as medical and surgical management strategies in the long-term for ectopic pregnancy (17). Apart from these, experimental exploration of new treatment strategies, including avoiding open surgery and assisting with the medication, can lead to outstanding results in keeping the patients healthy and preserving their fertility (18).

Conclusion

It is concluded that both medical and surgical management options demonstrate high efficacy in resolving ectopic pregnancy, with considerations for individual patient characteristics and clinical presentations. While medical management with methotrexate offers advantages such as shorter hospital stays and fewer complications, surgical interventions remain crucial for cases of tubal rupture or hemodynamic instability.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate.
Approved by the department concerned. (IRBEC-CIIHQ-09 dated 22-11-22)
Consent for publication.
Approved
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Conflict of interest

The authors declared an absence of conflict of interest.

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