ORIGINAL ARTICLE

EFFICACY OF VAGINAL MISOPROSTOL IN THE TREATMENT OF MISSED MISCARRIAGE BEFORE 24 WEEKS OF GESTATION

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ABSTRACT

Objective: To determine the efficacy of vaginal misoprostol in the treatment of missed miscarriage in less than 24 weeks of gestation.

Study Design: Cross-sectional study.

Place and Duration of Study: Department of Obstetrics & Gynecology, Swat Medical Complex, Swat, 06 months (August 2025 to February 2026).

Methodology: This study was conducted on 194 patients, aged 18 to 40 years, with miscarriage of < 24 weeks of gestation. We determined the efficacy of vaginal misoprostol in the treatment of missed miscarriage. The dosage of vaginal misoprostol was adjusted according to the period of gestation and administered in compliance with the International Federation of Gynecology and Obstetrics (FIGO)-recommended protocol for pregnancy termination.

Results: The mean age of the patients was 29.03±6.66 years. The mean gestational age was 16.89±3.19 weeks. 68% patients had parity 0-3, while 32% patients had parity > 3. The efficacy of misoprostol in our study was 93 (47.9%) with p=value 0.05. A greater proportion of successful outcomes was observed in patients with a gestational age of less than 18 weeks (63.4%) compared with those at 18–24 weeks of gestation (36.6%); however, it did not reach statistical significance (p = 0.38).

Conclusion: Vaginal Misoprostol in the treatment of missed miscarriage in less than 24 weeks of gestation was effective in terms of non-surgical complete evacuation of the conception product.

Key words: *Gestational age, miscarriage, misoprostol, pregnancy, termination of pregnancy.*

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INTRODUCTION

The fetus is deemed viable after the 24th week of pregnancy. The evacuation of the fetus prior to 24th week is termed to as an abortion or miscarriage. The surgical procedure and the medical approach are the two options for ending a pregnancy[1]. Since the 1960s, surgical miscarriage of up to 63 days has been undertaken by vacuum aspiration or dilatation and curettage, which has the merits of preventing extended hospital stays, permitting for a fast return to normal life, and in the majority of cases, achieving process completion. However, it calls for competence and anesthesia, and bears a higher risk of anesthesia-related and surgical consequences. Moreover, it is not a particularly effective way to end a second-trimester pregnancy[2].

Mifepristone with prostaglandins, mifepristone, prostaglandins, methotrexate, and methotrexate with prostaglandins are among the abortifacient treatments[3]. The effectiveness of prostaglandins around the world, including Pakistan, is observed. Misoprostol is an E1 prostaglandin analogue that has been approved in around 85 countries; however, it has only been approved for the treatment of gastrointestinal ulcers[4].

Misoprostol, which was primarily used in obstetrics to induce labor, is now utilized for several of purposes, including cervix ripening and postpartum hemorrhage control. A study found that the use of oral or vaginal misoprostol for therapeutically managing missed miscarriages is both highly successful and well accepted, with a shorter time between induction and miscarriage and greater acceptability [5].

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A higher dose may be required to induce miscarriages. The ideal vaginal misoprostol dose for termination of pregnancy in the second trimester is between 50 - 1200 mg, early during the second trimester, whereas a lesser amount would be appropriate in the latter phases[6]. A study showed the efficacy of misoprostol in 56% of patients who had a complete miscarriage without surgical intervention[7].

CAPSULE SUMMARY

Efficacy of vaginal misoprostol in the treatment of missed miscarriage in less than 24 weeks of gestation was determined. It was found to be effective in terms of non-surgical complete evacuation of the conception product.

Missed miscarriage leaves a psychological impact on a patient's life in the form of depression and anxiety that often lasts for months, resulting in a degradation in quality of life[8]. Surgical interventions and costly treatments are available to effectively terminate the pregnancy with lower drawbacks, but these are expensive, and sometime higher dose is recommended. Consequently, a cheaper and effective alternative agent is needed. The goal of this research was determination of the efficacy of misoprostol in patients with missed miscarriage before 24 weeks of gestation.

METHODOLOGY

A cross-sectional study was conducted in the Obstetrics & Gynecology department, Swat Medical Complex, Swat, from August 2025 to February 2026. The sample size is 194, determined with the help of the WHO sample size formula by taking the efficacy of 56% after using misoprostol in patients who had missed miscarriage, with 95% confidence level, and 7% margin of error [7].

Patients in the age range of 18-40 years, with missed miscarriage < 24 weeks of gestation were included. Patients with incomplete, threatened miscarriages, those with gestational trophoblastic disease, and patients with irregular coagulation profiles were excluded.

The research proceeded after proper permission from the hospital's ethical review board. Subjects that met the inclusion requirements were included in the study. Patients were informed about the goals, risks, and advantages of the study. A signed written informed consent form was obtained from the patients and their demographic data, including age and address were noted in the file. To ensure the inclusion criteria, complete medical history was taken, and thorough physical examinations were performed. Patients who had missed miscarriage of less than 24 weeks of pregnancy were given vaginal misoprostol according to International Federation of Gynecology and Obstetrics (FIGO) recommendations, for gestation less than 13 weeks 800ug and after 13 weeks gestation 400 ug was given respectively every 3 hourly till complete expulsion of the product of conception. The efficacy of the treatment was assessed. The information of the patients was stored on dedicated proforma.

Data was analysed by using SPSS version 23. Mean + Standard Deviation were determined for quantitative variables, like age and gestational age. Frequencies and percentages were determined for categorical variables, like efficacy, complications, parity, and socioeconomic status. The efficacy was stratified by age, gestational age, parity, complications, and socioeconomic status to see the effect-modifiers. Post-stratification chi-square test was performed where a p-value of < 0.05 was considered significant. All results were shown in tables.

RESULTS

The current study was conducted on 194 patients with a mean age 29.03±6.66 years. Mean gestational age was 16.89±3.19 weeks. Regarding the age distribution, there were 113 (58.2%) patients in the age range of 18 to 30 years and 81 (41.8%), in the age group of 31 to 40 years. Regarding parity, there were 132 (68%) patients having parity of 0 to 3, while 62 (32%) patients had parity > 3. In our study, 36 (18.6%) patients had nausea, 64 (33%) had vomiting, and 43 (22.2%) had abdominal pain (Table-2). In terms of the socioeconomic status, 30 (15.5%) patients from a rich background (monthly income > 80000 PKR), 96 (49.5%) patients from a middle-class background (monthly income 50000 to 80000 PKR), and 68 (35.1%) patients from a poor background (monthly income < 50000 PKR). The efficacy of misoprostol in our study was 93 (47.9%) (Table-1).

Table:1-Efficacy of Misoprostol

Efficacy of misoprostol	Frequency (n)	Percent (%)
Yes	93	47.9
No	101	52.1
Total	194	100.0

Table:2-Complications Related to Misoprostol

Complications	Frequency (n)	Percent (%)	p-value
Nausea			
Yes	36	18.6	0.05
No	158	81.4	
Total	194	100.0	
Vomiting			
Yes	64	33.0	0.15
No	130	67.0	
Total	194	100.0	
Abdominal pain			
Yes	43	22.2	0.57
No	151	77.8	
Total	194	100.0	

DISCUSSION

The evacuation of the fetus before the end of the 24th week is referred to as an abortion or miscarriage. Pregnancy failure that is detected before the evacuation of fetal and placental tissues in < 24 weeks of gestation is called a missed miscarriage because the fetus is deemed viable after the 24th week of pregnancy. According to estimates, 25% of women are likely to experience an early pregnancy loss during their reproductive life, and between 10% and 15% of confirmed pregnancies result in miscarriage[1]. About 30 million induced miscarriages occur annually, highlighting the need for a safe and efficient method to make it a worldwide concern for gynecologists and patients. Pregnancy can be ended surgically or medically.

Since the 1960s, surgical miscarriage of up to 63 days, by vacuum aspiration or dilatation and curettage, has been the preferred approach as it avoids a lengthy hospital stay, allows for an instant return to normal life, and guarantees that the treatment is completed in the majority of instances However, it calls for expertise, anesthesia, and a higher risk of surgical and anesthetic complications. Additionally, it is not a very good approach for ending a pregnancy in the second trimester. With the advent of prostaglandins in the early 1970s and antiprogesterones in the 1980s, medical miscarriage emerged as a substitute technique of ending a first-trimester pregnancy. Prostaglandins, mifepristone, methotrexate, mifepristone with prostaglandins, and methotrexate with prostaglandins are the most extensively studied abortifacient medications[9].

Prostaglandins E1 (Cytotec) are studied for efficacy all around the world, including Pakistan. Since its initial commercialization in 1985, misoprostol, an E1 prostaglandin analogue, has been approved in more than 85 countries; nonetheless, it is currently solely authorized for the treatment of stomach ulcers. Since its initial use in obstetrics in 1993 to induce labor, misoprostol (Cytotec) has been utilized for a variety of purposes, including cervix ripening and postpartum hemorrhage control. A study found that using oral or vaginal misoprostol to treat missed miscarriages is both highly effective and acceptable, with a short induction to miscarriage time [10]. A higher dose may be required to induce miscarriages early in the 2nd trimester, whereas a smaller dose may be adequate in the late 2nd trimester. The ideal dosage of vaginal misoprostol for termination in the 2nd trimester is between 50 to 1200 µg. Two tablets (400µg) orally or vaginally, repeated 4 hourly till expulsion, or 4-tablets (800µg) vaginally 24 hourly till expulsion, if a miscarriage occurs between 4 - 12 weeks of gestation. Prostaglandin E2 is expensive and requires a high dosage, yet it is successful in miscarriage and pregnancy termination with fewer side effects[11].

Misoprostol has been safely and efficiently utilized in patients with fetal mortality for labor induction and cervical ripening. Oral misoprostol (400µg, 4 hourly) to induce labor after fetal death was originally documented by Mariani-Neto and colleagues. Twenty individuals with fetal death were the subjects of the authors' report. With an average delivery time of 552 minutes, every patient gave birth successfully. Misoprostol was taken at a mean dose of 1000 µg. Misoprostol's safety and effectiveness in treating fetal death have been evaluated in a few more trials[9].

Current research primarily compares different dosages, intervals between doses, and administration methods in order to optimise misoprostol dosing regimens. Misoprostol was administered at intervals of 3-12 hours, with dosages ranging from 100 to 1200 µg. Misoprostol is more effective when administered at shorter intervals (3 to 4 hours) at a higher dose (400–800 µg). However, because the oral route was more convenient, less painful, and offered greater privacy, women preferred it[12].

In our study, we sought to determine the efficacy of misoprostol in terminating a pregnancy that was unviable at less than 24 weeks of gestation, with respect to its dosage and success rate. Whenever a medication is administered, cost and safety are crucial considerations. Numerous prior research have shown prostaglandin E2 to be safe for pregnancy termination. But it's by no means inexpensive. We found that misoprostol's efficacy was 93 (47.9%), which is comparable to a study that revealed misoprostol's efficacy to be 56%[7].

Misoprostol had a 78.5% success rate, with 58.3% of patients experiencing full evacuation as verified by ultrasonography[13]. Misoprostol has a 46.5% success rate[14]. At the initial follow-up scan (10–14 days), an overall effectiveness rate of 68.8% was obtained[15]. The mean gravidity was higher (3 vs. 2, p = 0.007), and the frequency of vaginal bleeding or abdominal pain at presentation was higher (18.9% vs. 31.6%, p = 0.037) in another successful treatment (84.2%)[16].

When compared to manual vacuum aspiration, misoprostol has a lower full evacuation rate (84% vs. 94%, p=0.1123)[17]. The sublingual group had a considerably greater percentage of complete abortion than the vaginal group (86.1% vs. 77.1%, P=0.048)[18], In our study, however, the vaginal route accounted for 47.9%. Another study in Nowshera, KPK, found that oral misoprostol had a much lower success rate (64.9%) than vaginal misoprostol (87.6%) (p=0.001)[19]. However, in our study, the vaginal route accounted for 47.9%.

Oral misoprostol (75.0%) was not as effective as vaginal misoprostol (93.1%) (p=0.009)[20]. Success rates for manual vacuum aspiration were much greater than those for oral misoprostol (98.8% vs. 82.7%, p<0.001)[21]. According to a study conducted in Karachi on first-trimester miscarriages, the main reasons for medical termination were missed miscarriages, which accounted for 67.5% of cases, and 14.5%of cases among patients in the second trimester. In this case, the effectiveness was 59% for pregnancies under 18 weeks and 34% for those between 28 and 24 weeks[22].

When the two groups' safety rates were compared, group A's was 68.0% and group B's was 91.7%, with a gestational age of 15–20 weeks. With a p-value of 0.25, group A's safety rate for gestational ages under 15 weeks was 78.6%, while group B's was 89.7%[23].

In Islamabad, the rate of success was significantly higher (p-value < 0.05) in the sublingual misoprostol group (76.67%) than in the vaginal misoprostol group (58.33%)[24]. Of the patients treated with misoprostol, 23.3% required additional surgical evacuation, 76.7% were successfully managed by medical treatment, 73.3% reported overall satisfaction, and 76.7% demonstrated treatment acceptance.

The results may not be as applicable to different healthcare settings and demographics because the study was carried out in a single-center hospital. Due to regional and institutional differences in patient characteristics and healthcare practices, the sample population could not accurately reflect the larger community. Misoprostol reaction may have been impacted by differences in patients' gestational age, parity, and prior obstetric history. The study did not compare results with alternative treatment techniques, such as surgical evacuation or expectant management, and instead concentrated solely on medicinal care using misoprostol. The evaluation of long-term problems and patient satisfaction may have been constrained by short-term follow-up.

Treatment results and monitoring may have been impacted by resource constraints and disparities in clinical expertise.

CONCLUSION

In terms of non-surgical full evacuation of the conception product, we conclude that vaginal misoprostol was effective in treating missed miscarriages in less than 24 weeks of gestation.

ETHICAL APPROVAL: *27-ERB/SMC/STMC/026.*
CONSENT FOR PUBLICATION: *Written, informed consent was obtained from the study participants.*
AVAILABILITY OF DATA: *Data is available from the corresponding author on a justified request.*
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AUTHORS' CONTRIBUTION

- ***Maha Khan:*** *Conception and design, Analysis and interpretation of data, Drafting the article, Critical revision*
- ***Romana Bibi:*** *Acquisition of data, Drafting the article, Critical revision*
- ***Asma Hameed:*** *Conception and design*
- ***Muhammad Awais:*** *Acquisition of data, Drafting the article, Critical revision*
- ***Mehwish Khan:*** *Acquisition of data, Analysis and interpretation of data, Critical revision*
- ***Ammara Khan:*** *Conception and design, Analysis and interpretation of data*

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