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Original Article

Termination of Pregnancy: Misoprostol Versus Prostaglandin E2

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ABSTRACT

Objective: To compare the efficacy of vaginal Misoprostol and vaginal prostaglandin E2 in termination of pregnancy.
Study Design: Quasi-experimental study.
Place and Duration of Study: Department of Obstetrics & Gynecology, Fauji Foundation Hospital, Islamabad, Pakistan, from Apr to Oct 2021.
Methodology: After taking informed consent, a total of 80 women between the age of 20-40 years were included in the study for termination of pregnancy. Molar or ectopic pregnancy, signs of septic abortion, Chronic Liver Disease, and bleeding disorders were excluded. In group A, a 200µgm tablet of Misoprostol was inserted intravaginal every 6 hours, a total of 4 doses, while in group B patients, a PGE2 3 mg tablet was inserted intravaginal, a total of 4 doses. All patients in both groups were evaluated after 24 hours, at which efficacy was noted.
Results: The mean age of women in Group-A was 27.18±3.81 years, and in Group-B was 27.18±4.96 years. The mean gestational age in Group-A was 11.83±3.24 weeks, and in Group-B was 12.20±3.30 weeks. In this study, efficacy (complete expulsion of the fetus within 24 hours of medication) was seen in 37 (92.50%) women in Group-A (Vaginal Misoprostol) and 29 (72.50%) women in Group-B (Vaginal prostaglandin E2) with a *p*-value of 0.019.
Conclusion: This study concluded that the efficacy of vaginal Misoprostol is better in termination of pregnancy as compared to vaginal prostaglandin E2.

Keywords: Misoprostol , Prostaglandins, Termination of pregnancy.

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INTRODUCTION

Early pregnancy failure is not uncommon, and it occurs in up to 20% of all recognized human pregnancies. One out of four women will experience at least one miscarriage in their lifetime.[1] It is of great concern, especially in low-resource countries, as it can result in excessive bleeding and infection with maternal morbidity and even mortality. Furthermore, psychiatric morbidity after miscarriage, like depression and anxiety, should be given due consideration.[2] Although the etiologies of first-trimester loss are multifactorial and often remain unknown, certain risk factors increase the likelihood of pre-gnancy loss.[3,4] Once a spontaneous pregnancy loss has been diagnosed, there are three forms of management: expectant, medical, or surgical. The optimal mode of management is determined by gestational age, whether the pregnancy loss is delayed or incomplete, maternal hemodynamic stability, the presence of infection, and most importantly, patient preference.[5,6]

Medical induction with prostaglandins has been recognized as a safe and effective alternative to surgical termination of pregnancy. The rationale of this study is to compare the efficacy (in terms of complete evacuation) of vaginal Misoprostol versus vaginal prostaglandin E2 in termination of pregnancy. As both drugs are used routinely in general practice, these particular patients can be provided with better and cost-effective drugs for complete evacuation in the termination of pregnancy. This reduces the complications of incomplete miscarriage as well as morbidity and mortality in patients.

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METHODOLOGY

After approval from Institutional Ethical Review Committee (Ref ltr no. 752/RC/FFH/Rwp) the quasi experimental study was conducted at the Department of Obstetrics & Gynaecology, Fauji Foundation Hospital, Islamabad Pakistan, from April to October 2021. The sample size was calculated by using WHO sample size calculator.[7] Non-probability, consecutive sampling technique was used.

Inclusion Criteria: All Primiparous and multiparous women presented for termination of pregnancy aged 20-40 years were included in the study.

Exclusion Criteria: Patients with vaginal bleeding (assessed clinically), molar or ectopic pregnancy

(assessed on ultrasonography), chronic liver disease (assessed on history & serum bilirubin >2.0mg/dl) signs of septic abortion (fever >37.7°C, purulent vaginal discharge, tachycardia or abdominal distension) previous cesarean section and bleeding disorder (INR >1.5) were excluded from the study.

A total of 80 women fulfilling the inclusion criteria were selected. Written informed consent was taken from the patients. Patients were divided randomly into two groups by lottery method (Figure). Each patient was offered to pick up a slip from the total mixed-up slips (half-slips contained the letter 'A' and other half-slips contained the letter 'B') and was placed in that respective group. In group A, a 200µgm tablet of Misoprostol was inserted vaginally every 6 hours, a total of 4 doses, while in group B patients, PGE2 3mg tablet was inserted vaginally, a total of 4 doses. All patients in both groups were evaluated after 24 hours when efficacy was noted. All the information (age, gestational age, parity, BMI, place of living, education level & efficacy was collected on the proforma.

Statistical Package for Social Sciences (SPSS) version 24.0 was used for the data analysis. Quantitative variables were expressed as Mean±SD and qualitative variables were expressed as frequency and percentages. Chi-square test was applied to explore the inferential statistics. The *p*-value lower than or up to 0.05 was considered as significant.

RESULTS

The mean age of women in Group-A was 27.18±3.81 years and in Group-B was 27.18±4.96 years. Majority of the patients 58 (72.50%) were between 20-30 years of age. Distribution of patients according to Gestational age and parity is shown in the Table-I.

Table-I: Distribution of Patients according to Gestational Age and Parity in Study Groups (n=80)

Gestational Age (Weeks)	Group A (n=40)	Group B (n=40)
	n (%)	n (%)
≤12	23 (57.50)	21 (52.50)
13-23	17 (42.50)	19 (47.50)
Mean ± SD	11.83 ± 3.24	12.20 ± 3.30
Parity		
Primiparous	06 (15)	08 (20)
Multiparous	34 (85)	32 (80)

Efficacy (complete expulsion of fetus within 24 hours of medication) is shown in the Table-II.

Table-II: Comparison of Efficacy Between both Groups (n=80)

		Group A (n=40)	Group B (n=40)
		n (%)	n (%)
Efficacy	Yes	37 (92.50)	29 (72.50)
	No	03 (7.50)	11 (27.50)

p-value was 0.019 which was statistically significant

Efficacy with respect to gestational age and parity is shown in the Table-III & IV respectively.

Table-III: Efficacy with Respect to Gestational Age (n=80)

GA (wks)	Group A (n=40) Efficacy		Group B (n=40) Efficacy		*p*-value
	Yes	No	Yes	No	
≤12	22 (95.65%)	1 (4.35%)	15 (71.43%)	6 (28.57%)	0.028
13-23	15 (88.24%)	2 (11.76%)	14 (73.68%)	5 (26.32%)	0.271

Table-IV: Efficacy with Respect to Parity (n=80)

GA (wks)	Group A (n=40) Efficacy		Group B (n=40) Efficacy		*p*-value
	Yes	No	Yes	No	
Primiparous	6 (100%)	0 (0%)	7 (87.50%)	1 (12.50%)	0.369
Multiparous	31 (91.18%)	3 (8.82%)	22 (68.75%)	10 (31.25%)	0.022

DISCUSSION

Misoprostol is a synthetic prostaglandin structurally related to prostaglandin E1.[5] It is principally used to prevent peptic ulcer disease induced by ingesting nonsteroidal anti-inflammatory agents. In previous studies of Misoprostol as an abortifacient, an oral route of administration has been used. When given in the first trimester of pregnancy in oral doses ranging from 400 to 800µg, Misoprostol was associated with a low rate of abortion and a high incidence of vaginal bleeding and abdominal pain.[6] When given 48 hours after an oral dose of 200 mg of mifepristone, oral doses of Misoprostol ranging from 200 to 1000 µg resulted in a high rate of abortion.[7] Intravaginal administration of drugs provides a slower, more constant rate of absorption than oral ingestion.[8]

Surrago *et al.* reported a series of 400 patients undergoing pregnancy termination in the second trimester, 232 of whom received PGE2 in the dose and frequency used in our study.[9] Although Surrago et al. reported a complete abortion rate of 79%, markedly lower than the rate we observed. Carbonell *et al.* used 800µgm of vaginal Misoprostol every 24-48 hours up to a maximum of 3 doses and a success rate of 87-94%[10] whereas in our study, 200 µgm Misoprostol every 6hourly used, showing a limited dosage regimen for a short period. Nagina *et al.* found Misoprostol to be a safe and effective agent for cervical ripening. Moreover, we found a convenient way of inducing abortion in the second trimester of pregnancy.[11]

In a study by Machlouf *et al.,* the rate of complete abortion was 100% and 66.67%, where intravaginal Misoprostol and dinoprostone for second-trimester

pregnancy termination were compared.[12] Agrawal *et al*. found in the comparative study that intravaginal Misoprostol Group patients had significant (p<0.001) shorter abortion induction interval with lesser requirement of oxytocin than the conventional dinoprostone (PGE2) group.[13] In the study by Wildschut *et al*., forty randomised controlled trials were included to compare various agents for pregnancy termination and methods of termination for their efficacy and effects. Misoprostol was found effective when used alone, though it appeared more effective in combination with mifepristone.[14]

In the study by Bugalho *et al.,*[15] an abortion rate of 91% was noted with the administration of mostly higher doses of Misoprostol vaginally every 24 hours. The optimal dosage and frequency of administration of this agent need to be determined in further studies. About 10% of elective abortions in the United States are performed when the gestational age is >12 weeks. The technique most commonly used to terminate these pregnancies is dilatation and evacuation. Although this procedure has been shown to have low rates of minor morbidity through the 20th week of gestation, the risk of major morbidity, including bowel injury and uterine injury requiring hysterectomy, increases with advancing gestational age, and serious injuries sometimes occur even when the procedure is performed by experienced operators.[16,17] Other techniques used to terminate pregnancies in the second trimester include the intrauterine infusion of saline or prostaglandin. These techniques are also associated with severe maternal complications, including coagulopathy, haemorrhage, and infection.[18] Misoprostol may thus prove to be a safe alternative means of achieving elective abortion in the second trimester. Ashok et al. gave 200mg oral mifepristone, followed after 36-48 hours by 800µg vaginal Misoprostol .[19] After 3 hours, oral Misoprostol 400µg was given three hourly for four doses (total of five doses) in 999 women at 13-21 week of gestation. The success rate was 97.1%, taking expulsion of the fetus with or without placenta within 15 hours. With the same criteria, the success rate in the present study would be 96% in Group-1 and 100% in Group-2. Gupta *et al.* gave 200 mg mifepristone orally, followed by 800 µg vaginal Misoprostol after 36-48 hours.[20] After another 4-6 hours, 400 mcg of Misoprostol, orally or sublingually, was given thrice in 70 women at 13-20 weeks of gestation. Success was taken as the expulsion of the fetus with the placenta within 15 hours of the first dose of Misoprostol; the success rate was 91.42% at 15 hours. With the same criteria, the success rate in this study is 88% in Group-1 and 92% in Group-2.

CONCLUSION

This study concluded that the efficacy (in terms of complete evacuation) of vaginal Misoprostol is better in the termination of pregnancy as compared to vaginal prostaglandin E2. So, we recommend that vaginal Misoprostol should be used as a first-line method in the termination of pregnancy in order to reduce maternal morbidity and mortality.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

ITB & FI: Data acquisition, data analysis, critical review, approval of the final version to be published.

SQ & AM: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

TF& SG: Concept, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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