

Comparative Study of Oral Mifepristone and Endocervical Prostaglandin PGE2 Gel as Preinduction Cervical Ripening Agent in Primigravida.

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Abstract

Introduction: Induction of labor is a most common obstetric intervention. Commonly used drugs for induction of labor are prostaglandin analogues such as dinoprostone (PGE2) and misoprostol. Mifepristone/RU-(486), a new class of drug is used for inducing labour in late pregnancy by antagonizing progesterone, thus increasing uterine contractility and by increasing the sensitivity of the uterus to the actions of prostaglandins.

AIM: This study aims to compare the effectiveness and safety of mifepristone with PGE2 gel for cervical ripening and induction of labor in term pregnancy.

Methods: Randomized controlled study, 50 patients were included and divided into group A (Mifepristone) consisting 25 patients and Group B (Dinoprostone gel)

consisting 25 patients. Tablet Mifepristone 200mg given orally in group A, and intracervical PGE2 gel in group B. Preinduction Bishop score was noted and compared with post induction Bishop score. Mode of delivery and induction to delivery interval were noted in both groups.

Results: Change in bishop score was noted, and it was comparable in both groups.

Induction to delivery interval was significantly less in group B (18 +/- 2 hours) as compared to group A (28 +/- 4 hours). The rate of vaginal delivery was 65% in group A and 57% in group B.

Conclusion: Mifepristone is more effective than PGE2gel for cervical ripening as it has high rate of vaginal delivery and good neonatal outcome.

Keywords: Mifepristone, Dinoprostone gel, BISHOP Score.

Introduction

During pregnancy the cervix has to play dual role in human reproduction. The cervix should remain firm and closed allowing the foetus to grow in-utero until functional maturity is attained and during the labour it should soften and dilate to allow the foetus to pass through the birth canal.

The process by which the cervix becomes soft, compliant and partially dilated is termed as “cervical ripening” and it is essential for the success of labour induction.

Thus, the goal of cervical ripening is to reduce the induction-to-delivery time¹. A good BISHOP score is associated with successful induction rate and induction between 37-41 weeks has the potential to improve fetomaternal outcome². Induction of labor is a most common obstetric intervention.

Commonly used drugs for induction of labor are prostaglandin analogues such as dinoprostone (PGE2) and misoprostol.

Mifepristone/RU-(486), a new class of drug is used for inducing labour in late pregnancy by antagonizing progesterone, thus increasing uterine contractility and by increasing the sensitivity of the uterus to the actions of prostaglandins³.

It has anti-glucocorticoid and antiprogesterone properties. It increases uterine activity and causes cervical effacement and dilatation for pregnancy termination.

The pharmacokinetics of mifepristone are characterized by rapid absorption and a long half-life of 25-30 hours⁴. In late pregnancy, the uterus is sensitized by mifepristone to prostaglandins (PG) and promotes

cervical ripening which induces labor.

Aim

To compare the effectiveness and safety of mifepristone with PGE2 gel for cervical ripening and induction of labor in term pregnancy.

To observe the improvement in bishop score.

To view maternal and foetal outcome in our study.

Materials and methods

Study design: Randomized control study.

Sample size and inclusion criteria

50 primigravida with singleton pregnancy with vertex presentation with term gestation with no contraindication for vaginal delivery.

Conducted at Basaveshwar teaching and general hospital and sangameshwar hospital attached to Mahadev Appa Rampure medical college, kalaburagi between March 2020- March 2022.

Methodology

A detailed history was collected by using validated data collection form, the general physical examination and obstetrics examination was performed. Routine investigations including complete blood counts, random blood sugar, tests for HIV (Human Immunodeficiency Virus) and HbsAg was done. The recent term ultrasonography report and reactive Non-Stress Test (NST) was done to assess the foetal well-being. 50 women were included in the study and randomly allocated as group A and group B.

Group A: 25 pregnant women were given tablet mifepristone 200 mg orally.

They were observed for maternal vitals, uterine activity bleeding or draining pv, and fetal heart rate.

After the wait period of 24 h or when the bishop score was ≥ 6 or when the cervical dilatation was >3 cm or when the membranes ruptured or when the patient was

well in labor whichever is earlier labor was accelerated with oxytocin drip.

Group B: 25 pregnant women pregnant were instilled endocervical PGE2 gel 0.5 mg. They were observed for maternal vitals, uterine activity, bleeding, draining pv, and fetal heart rate. After the wait period of 6 h or when the bishop score was ≥ 6 or when the cervical dilatation was $>3\text{cm}$ or when the membranes ruptured or when the patient was well in labor whichever is earlier labor was accelerated with oxytocin drip.

Maternal vitals, uterine activity, and fetal heart rate were monitored clinically. Partogram was maintained for all patients and used to record all the clinical events during the course of labor. A watch for the rupture of membranes was done. If membranes not ruptured, ARM was done at 4cm cervical dilatation. Per-vaginal examination was done if there was rupture of membranes or in active phase of labor. The pulse rate, blood pressure, temperature, and urine output were recorded. Delivery particulars, duration of each stage of labor, blood loss at the third stage of labor, and baby particulars were recorded. Mother and baby were observed for postnatal complications if any.

Results

Change in bishop score was noted, and it was comparable in both groups. Preinduction bishop score was comparable in both the groups that is 3 and post induction bishop score was 8 ± 2 in group A and 7 ± 2 in group B.

Induction to delivery interval was significantly less in group B (18 ± 2 hours) as compared to group A (28 ± 4 hours). The rate of vaginal delivery was 65% in group A and 57% in group B.

The number of neonates requiring NICU admission was 4 in group A and 10 in group B.

Meconium-stained liquor was seen among 5 patients in group A and 7 patients in group B.

Number of patients who needed augmentation of labor was 11 in group A and 15 in group B.

Table 1: Bishop score

Bishop score	Group a	Group b
Preinduction	3	3
Postinduction	8 ± 2	7 ± 2

Table 2: outcome

Outcome	Group a	Group b
Vaginal delivery	16	10
Ceasarean delivery	9	15

Table 3: Liqour status

Liqour status	Group a	Group b
Meconium	5	7
Clear	20	18

Table 4: Need for augmentation

Need for Augmentation	Yes	No
Group A	11	14
Group B	15	10

Table 5: Drug administration to delivery interval

Administration to deliver interval	In hours
Group A	28 ± 4 hours
Group B	18 ± 2 hours

Table 6: NICU admission

NICU admission	YES	NO
Group A	8	17
Group B	10	15

Discussion

Mifepristone has been used to induce labour or to allow pregnancy to be terminated. In present study, we opted for 200mg mifepristone as a tablet and observation period was of 24 hours similar to Mohapatra Set a, Wing et al, Arumugalselvi et al study and Salitha et al⁵⁻⁷.

In Wing et al mifepristone was compared with placebo whereas in others with PGE2 gel like in our study. In our study term gestation between (37-42) weeks were included but maximum cases were of GA between 40-42weeks in our study which is similar to study of Fathima et al and Su et al in 1996^{8,9}.

Patients with bishop's score less than 5 were included in both study groups. Similar study was done by Bashutheen et al in which Bishop's score of 1-6 were included. According to another study by Deepika et al 400mg mifepristone was given with Bishop's score <6.12¹⁰.

In our study, mean Bishop's score at start of the study was 3 (Table 1), which was comparable with Saranya study, where mean bishop's score at start was 2.72 and Yellikar et al with mean bishop's score 2.02^{11,12}.

Favourable bishop score of 8+/-2 in group A and 7+/-2 in group B which was consistent with Sahet al, Saranya et al, Arumugaselvi^{6,11,13}. Study done by Sah et al in 2018 with 76% in mifepristone gr and 56% in PGE2 gr with 200mg mifepristone. It was 96.6% in mifepristone gr and 76.6% in PGE2 gr according to the study done by Gaikwad et al¹⁴.

The need for augmentation with oxytocin was 60% in the mifepristone group and 70% in PGE2 group (Table 4) which was similar with Arumugaselvi et al where 66% in mifepristone gr and 78% in PGE2 gr required oxytocin. Similar study was done by Wing et al where 67% in mifepristone group required oxytocin for augmentation as compared to placebo^{5,6}.

According to Salitha et al oxytocin requirement was less in mifepristone group (24%) as compared to Cervi prime group (38%)⁷.

65% (16) and 57% (10) patients underwent normal vaginal delivery from group A and group B respectively (Table2).

The results were consistent with Bama et al study where the vaginal delivery is 96% in mifepristone group and 72% in PGE2 gel group¹⁵. Success rate was 87.5% in mifepristone group in Wing et al study⁵.

Rate of LSCS in mifepristone group in our study was 35% and 43% in PGE2 gel group. Similar findings were noted by Sah et al and Shanitha et al.

The most common indication for LSCS was fetal distress in both the groups which was comparable with study of Shanitha et al and Sah et al^{7,8}.

None of the patient of mifepristone group had hypertonus or tachysystole which was comparable with Wing et al⁵.

Meconium passage was encountered in 20% in mifepristone group and 30% in PGE2 gel 4 newborns in mifepristone group (Table 3) and 10 newborns from PGE2 gel group required NICU admission (Table 6). APGAR score at 1minute and 5 minute were similar in both groups.

Conclusion

This study reveals that oral mifepristone is very safe and an effective drug for preinduction cervical ripening. It has an added advantage of ease of administration, better patient compliance and acceptance, reduced oxytocin requirement. The drug has no untoward side effects on uterine contraction and no major maternal complications. Mifepristone is more effective than PGE2gel for cervical ripening as it has high rate of vaginal delivery and good neonatal outcome.

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