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Original Research Article

A comparative evaluation of 25 mcg versus 50 mcg vaginal misoprostol for induction of labour at term in a tertiary care Hospital

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ABSTRACT

Background: Misoprostol is a synthetic PGE1 used for cervical ripening and induction of labour. However, the optimal dose of misoprostol to be used is a controversial issue.
Objective: of the study was to determine the efficacy and safety of 25 mcg versus 50 mcg vaginal misoprostol for induction of labour at term based on maternal and fetal outcomes.
Materials and Methods: This prospective cross-sectional study was carried out in the Department of Obstetrics and gynecology, Prathima Institue of Medical Sciences, Naganoor, Karimnagar. The patients were randomly allotted to either receive misoprostol 25 μg (Group I) or misoprostol 50 μg (Group II) respectively. The patient's group was recorded in the case file. After the confirmation of Bishop's score to be less than 6 the choosen dose of misoprostol was kept in the posterior fornix under aseptic conditions. The doses were repeated after 6 hours with a maximum of 4 doses till the patients get adequate uterine contractions which are defined as three contractions per 10 minutes or cervical dilatation of > 3cms.
Results: Group I received 25μg of misoprostol intravaginally and Group II received 50μg of intravaginal misoprostol. The majority of women in this study n = 85 out of n=120 were primigravida. The distribution of primigravida in group I was n=48 and group II was n=37. The maternal complications were recorded in n=2(3.33%) of group II and n=1(1.67%) of group I patients. It appears that the higher doses of misoprostol used in group II is one of the cause although the values were statistically insignificant.
Conclusion: In conclusion, we found that the efficacy of 25μg of intravaginal misoprostol is comparable to 50 μg of intravaginal misoprostol for induction of labour. The advantages of 50μg of intravaginal misoprostol were it expedited vaginal deliveries. However, it also resulted in greater frequencies of complications to mother and fetus. Therefore we recommend the use of 25μg routinely and 50μg intravaginal misoprostol may be reserved for those with lower Bishop's scores.

1. Introduction

Induction of labour is one of the common obstetric interventions performed in obstetric practice. It is defined as an intervention intended to artificially initiate uterine contractions that will result in progressive effacement and dilatation of the cervix.[1] The incidence across the world is 1 in 5 pregnancies in developed countries and 1 in 10 pregnancies in developing countries.[2] The procedure is desired when the benefit of delivery overweighs the risks of continuing the pregnancy in conditions such as gestational hypertension, intrauterine growth retardation, and post dates, premature rupture of membranes or Gestational diabetes mellitus.[3] Roughly about 50% of women undergoing labor induction have an unfavorable cervix. Such a condition can lead to prolonged labour, increased risk of instrumental deliveries, prolonged postpartum hemorrhage and increased rates of neonatal ICU admissions.[4] Misoprostol (15 deoxy-16-hydroxy-16-methyl prostaglandin E1) a synthetic prostaglandin E1 analog is the most widely used agent for induction of labor.[5,6] It was initially used for the treatment of peptic

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ulcers because of its ability to reduce gastric acid secretion and mucosa protective actions. It had cervical softening and uterotonic effects vaginal misoprostol has a longer duration of action at lower serum levels, it is more effective than oral and sublingual routes.[7,8] Although, no definite conclusion regarding the dose and frequency of administration of misoprostol for labor inductions.[9,10] The other agents for induction of labor such as oxytocin, PGE2, mechanical methods are present. However, it is has been found that there are a shorter induction delivery interval and decreased rates of failed induction with misoprostol as compared to oxytocin.[11,12] At the same time higher doses are also found to be associated with uterine hyperstimulation therefore it is necessary to determine the safe dose of misoprostol for labor induction.

2. Objective of the Study

The main objective of the present study was to evaluate efficacy and safety of 25μg and 50μg of intravaginal misoprostol for induction of labour at term and to study the maternal and fetal outcome in patients who reported to our tertiary care hospital.

3. Material and Methods

This prospective cross-sectional study was carried out in the Department of Obstetrics and gynecology, Prathima Institue of Medical Sciences, Naganoor, Karimnagar. Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the participants of the study. The inclusion criteria were women with $\geq$ 37 weeks of gestation, Singleton pregnancy, Vertex presentation, intact membranes. Excluded were the patients with Bishop's scoring > 6, parity > 4 any contraindications for vaginal delivery and use of prostaglandins. A total of 120 patients were identified and treated during the study period from January 2015 to February 2016. The patients underwent Cardiotocograph (CTG) as well as an obstetric scan for estimation of fetal weight and exclusion of contraindications for vaginal delivery. The patients were randomly allotted to either receive misoprostol 25 μg (Group I) or misoprostol 50 μg (Group II) respectively. The patient's group was recorded in the case file. After the confirmation of Bishop's score to be less than 6 the chosen dose of misoprostol was passed in the posterior fornix under aseptic conditions. The doses were repeated after 6 hours with a maximum of 4 doses till the patients get adequate uterine contractions which are defined as three contractions per 10 minutes or cervical dilatation of > 3cms. At the onset of labour, the patients were shifted to the labour ward and labour was monitored on a partogram. The time of doses of misoprostol passed and the time of onset of labour was recorded. When cervical dilatation of 4cm was achieved and if no contraindications present an artificial rupture of the fetal membrane was performed. If required the labor was augmented by 10U oxytocin in the 1 L infusion. The total doses of induction, induction to delivery interval, mode of delivery, rate of cesarean section maternal side effects, fetal outcomes like meconium-stained liquor, fetal heart rate, Apgar score, neonatal resuscitation, and NICU admissions were recorded and entered in MS Excel and analyzed using SPSS version 19 software for statistical significance.

4. Results

A total of n = 120 women randomly allotted into two groups of n = 60 each. Group I (n = 60) received 25μg of misoprostol intravaginally and Group II (n = 60) received 50μg of intravaginal misoprostol. There was no statistical difference when both the groups were compared based on the age, parity, mean Bishop Scores at the baseline.

Table 1: Showing the demographic profile of patients in the study

Age group	Misoprostol 25 μgGroup IN=60 (%)	Misoprostol 50 μgGroup IIN=60 (%)
21 – 24	9(15)	6(10)
25 – 29	40(66.67)	38(63.33)
30 – 32	11(18.33)	16(26.67)
Mean	27.22	29.55
SD	2.25	3.66
Range	21- 31	22-32

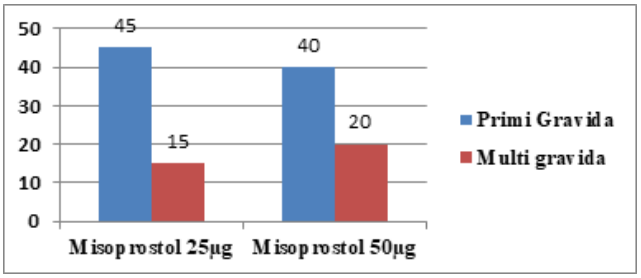

Fig. 1: Showing the distribution of cases based on gravidity

The most common indication for labour induction in both groups was postdatism followed by gestational hypertension. Intrauterine growth fetal distress was seen in n = 3(5%) in group I cases and n = 2(3.33%) in group II. The other indications of induction in group I were n = 1(1.67%) case each of oligohydramnios and fetal distress. In the group II the other indications for induction were n = 2(3.33%) of premature ruptured membranes shown in Table 2.

In the group I n = 30 patients received two doses and n=30 required additional 3 and 4^{th} dose for induction where as in the group II n = 33 received two doses and n=27 required 3^{rd} and 4^{th} dose subsequently for induction. The p values were not found to be significant in both the groups as shown in theTable 3.

Table 2: Indication for labor induction in patients of the study

Indications	Misoprostol 25 μgGroup I N=60 (%)	Misoprostol 50 μgGroup II N=60 (%)	P values
Post datism	36 (60)	32(53.33)	0.477
Gestational hypertension	6 (10)	8(13.33)	0.669
Intrauterine fetal distress	3 (5)	2(3.33)	0.92
Gestation Diabetes Mellitus	2 (3.33)	1(1.67)	0.884
Intrauterine Growth retardation	1 (1.67)	2(3.33)	1.2
Others	2 (3.33)	2(3.33)	1.5

Table 3: doses of Misoprostol received in group I and group II patients

No of Misoprostol doses	Misoprostol 25 μgGroup I N=60 (%)	Misoprostol 50 μgGroup II N=60 (%)	P values
1	05(8.33)	12(20)	0.122
2	25(41.67)	21(35)	0.569
3	20(33.33)	19(31.67)	0.88
4	10(16.67)	08(13.33)	0.322

In group I n = 45 were primigravida patients and n = 15 multigravida patients. Of the n=45 primigravida n = 39 had vaginal deliveries and out of n = 15 multigravida n = 11 had vaginal deliveries. In the group II n = 40 primigravida and n=20 were multigravida patients. Out of n = 40 primigravida n = 30 had vaginal deliveries and out of n = 20 multigravida n = 14 had vaginal deliveries. Most of the deliveries occurred at the interval from 12 – 24 hours of misoprostol administrations in both the groups the p values were not found to be significant shown inTable 4.

Table 4: Vaginal deliveries duration in both groups of patients

Vaginal delivery	Misoprostol 25 μgGroup I N=60 (%)	Misoprostol 50 μgGroup II N=60 (%)	P values
< 12 hours	9(15)	15(25)	0.02*
12 – 24 hours	27(45)	26(43.33)	0.39
> 24 hours	12(20)	09(15.0)	0.22
Total	48(80)	50(83.33)	

* Significant

Slightly higher incidences of vaginal deliveries were seen in group II compared to group I although p values were not found to be significant. Of the n = 8 caesarean deliveries in group I n = 5 were in primigravida and n = 3 were in multigravida. In the group II out of n = 8 caesarean deliveries n = 2 in primigravida and n = 6 in multigravida given in Table 5.

Table 5: Mode of delivery in both groups

Mode of delivery	Misoprostol 25 μgGroup I N=60 (%)	Misoprostol 50 μgGroup II N=60 (%)	P values
Vaginal delivery	48 (80)	50(83.33)	0.69
Cesarean delivery	8 (13.33)	8(13.33)	0.10
Instrumental vaginal delivery	4 (6.67)	2(3.33)	0.22
Total	60 (100)	60(100)	

The over all maternal complications were recorded in group I was in n = 2(3.33%) cases. In group II the total number of maternal complications were found in n = 4(6.67%) given in Table 6. The higher incidences of complications in group II is attributed to the higher dose of misoprostol used in the group II although the values were statistically not significant.

Table 6: Showing the maternal complications in both groups

Maternal complications	Misoprostol 25 μgGroup I N=60 (%)	Misoprostol 50 μgGroup II N=60 (%)	P values
Uterine Tachysystole	1 (1.67)	2 (3.33)	0.5
Uterine Hypertonus	0 (0.0)	0 (0.0)	0.112
Uterine hyperstimulation syndrome	0 (0.0)	1 (1.67)	0.22
Post partum hemorrhage	1 (1.67)	1 (1.67)	1.0
Total	2 (3.33)	4 (6.67)	

The neonatal complications in group I Apgar scores of < 7 @ 1 minute was found in n = 1 case and Apgar < 7 @ 5 minutes was seen in n = 2 cases. In group II the Apgar scores of < 7 @ 1 minute was in n = 3 cases and Apgar < 7 @ 5 minutes was found in n = 2 cases. Similarly SCBU admission rates were higher in group II and severe birth asphyxia was found in n = 1 of group II cases only given in Table 7.

5. Discussion

Induction of labour is commonly required when the Bishop scores are scores are less than 6. The use of pharmacological methods by the use of misoprostol is very popular and is increasing in use recently. The common cause of induction in this study was postdatism in n = 66(55%) of the total n = 120 patients. Followed by gestational hypertension in n=14(11.67%). The results of this study were comparable to Vidyashree et al.;[13] and Agarwal A et al.;[14] who have

Table 7: Frequency of neonatal complications in both groups

Neonatal complications	Misoprostol 25 μgGroup I N=60 (%)	Misoprostol 50 μgGroup II N=60 (%)	P values
Apgar < 7 (1 min)	1(1.67)	3(5)	0.55
Apgar < 7 (5 min)	2(3.33)	2(3.33)	0.92
SCBU admission	1(1.67)	2(3.33)	0.32
Severe birth asphyxia	0(0.0)	1(1.67)	0.17

noted similar findings in their studies. Although the exact reason for post dated pregnancies now is not clear it may be due to increased availability of ultrasound scans and earlier booking. In this study we found the mean number of doses in group II to be less as compared to group I although the values were not found to be statistically significant. Meydanli et al.;[15] the mean number of misoprostol doses to be lesser in 50 μg group as compared to 25 μg group. In this study, 80% of group I and 83.33% of group II had vaginal deliveries and n = 53(44.17%) out of n = 120 deliveries were in the period between 12 – 24 hours.

The proportion of women delivered vaginally within 12 hours of induction was 25% in group II (50 μg) compared to group I (25 μg) the values were statistically significant. This is as per findings of El-Sherbiny et al.[16] and Meydanli et al.[15] who also found a statistically significant number of women had vaginal deliveries in 12 hours in 50 μg group. Similar findings have been shown by other studies in this field.[17–19] In the present study the mean induction to active stage interval was 10.50 hours in group II and it was 12.30 in group II. Similar findings have been noted by Elhassan et al.[20] where they found the mean induction to delivery interval was significantly longer in 25 μg group compared to 50 μg group. Meydanli et al.[15] in their study comparing 25 μg with 50 μg misoprostol, the induction vaginal delivery interval was five hours shorter in 50 μg group. However, they analyzed only postdated pregnancies. We in the present study found Apgar <7@ 1 minute in 5% of patients of group II as compared to 1.67% of group I although it was not found to be significant. Similarly, cesarean SCBU admission rates and birth asphyxia did not show dose-related differences in the study. Meydanli et al. and Nigam et al.[21] also reported no dose-related differences concerning the rates of cesarean, operative vaginal deliveries, abnormal Apgar scores, and SCBU admission rates. Gupta et al.[22] have shown that there is a higher incidence of Apgar scores < 7 at 1-min and admission to intensive care units in 50 μg group. The incidence of tachysystole in this study was seen in 1.67% of the 25 μg group and 3.33% in the 50 μg and hyperstimulation syndrome was found in 1.67% of 50 μg only. These were in accordance with findings of the other studies in this field which showed no statistical differences in the incidences of tachysystole and hyperstimulation syndrome in the two groups.[23,24] The important complications of misoprostol administration such as tachysystole and hyperstimulation can be serious if results in uterine rupture. Therefore prompt intervention at the onset of these complications is a must. In this study, no complications of uterine rupture were seen due to adequate management.

6. Conclusion

In conclusion, we found that the efficacy of 25μg of intravaginal misoprostol is comparable to 50 μg of intravaginal misoprostol for induction of labour. The advantages of 50μg of intravaginal misoprostol were it expedited vaginal deliveries. However, it also resulted in greater frequencies of complications to mother and fetus. Therefore we recommend the use of 25μg routinely and 50μg intravaginal misoprostol may be reserved for those with lower Bishop's scores.

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None.

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