Original Article

Comparison of Prostaglandin E2 with Misoprostol 25 Mcg for Labour Induction at Term Pregnancy

Aneesa Sadiq, Zul-e-Huma and Surraya Israr

ABSTRACT

Objective: To Compare the efficacy and cost effectiveness of prostaglandin E2 with misoprostol 25 mcg for labour induction at term pregnancy.

Study Design: Randomized controlled trial study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology, Gajju Khan Medical College Swabi in six months from January 2019 to June 2019.

Materials and Methods: Total 120 subjects were included in this study. These patients were divided in two groups. Group-1 and Group- 2. Group-1 was induced with PGE2, 3 mg tablets maximum of 2 doses, 6 hours apart. Group-2 induced with misoprostol 25 mcg 4 hourly, 4 doses. The subjects were full term pregnant women who were primigravida, 2nd or 3rd gravid and had bishop score less than 5.

Results: The patients included in the study were between the ages of 20 to 40 years. The mean age of patients was 31.35±5.82 in both groups (p value > 0.05). All the patients in both groups were between 37 to 42 weeks of gestation. The mean gestational age of group-1 and group-2 was 39.23±1.46 weeks and 39.08±1.60 weeks (p > 0.05) respectively. Mean duration of labor in group 1 was 7.8±3.81 hours whereas in group 2, it was 6.50±3.35 hours. Oxytocin injection was given in 55% (33) patients in group 1 and 43.33% (26) in group 2. 25 % (15) patients in group 1 and 15 % (9) in group 2 were having duration of labor more than 10 hours.

Conclusion: Misoprostol (PGE1 analogue) is a potent drug for labour induction with a short induction delivery interval and reduced need for Oxytocin augmentation. There is less rate of instrumental delivery and caesarean section and a reduced failure rate of induction with misoprostol.

Key Words: Misoprostol, Labour induction, PGE2, induction delivery interval, mode of delivery.

Citation of article: Sadiq A, Huma Z, Israr S. Comparison of Prostaglandin E2 with Misoprostol 25 Mcg for Labour Induction at Term Pregnancy. Med Forum 2020;31(8):24-27.

INTRODUCTION

Induction of labour is the intentional initiation of uterine contractions before spontaneous onset, leading to progressive dilatation and effacement of cervix and delivery of the baby[1,2]. The rate of induction varies by location and in many centers is currently more than 20%[3,4]. Cervical ripening is the most important part of the process of labour induction and the most important predictor of success. Ripening of the cervix greatly facilitates labour and increases the likelihood of vaginal delivery[5]. There is an increased risk of caesarean delivery and its associated complications due to induction[1,2,6].

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Received: April, 2020
Accepted: May, 2020
Printed: August, 2020

Nulliparous women with an unfavourable cervix, or low Bishop score, particularly are at high risk of caesarean delivery, due to lack of progress in labour if labour is induced[7,8]. Ripening agents are used when the cervix is unfavorable to increase the likelihood of successful induction, commonly prostaglandin E2[1,2,9]. Prostaglandins may be given via oral, intravaginal, intracervical and intravenous routes, all of which are effective[1]. Intravaginal administration of prostaglandin E2 is the most widely used pharmacological method to promote cervical ripening and labour induction[10]. Misoprostol, a prostaglandin E1 analogue manufactured for the prevention and treatment of gastric ulcers, has also been evaluated as a cervical ripening agent and has some potential advantages compared with PgE2. Misoprostol is inexpensive, stable at room temperature, easy to administer and may be given as an oral medication. The above features make it ideal for its use in third world countries. Though the drug in not licensed with FDA for use in pregnant women but worldwide it is being used for ripening of cervix and induction of labour as well[11].There is concern that misoprostol may increase the rates of tachysystole and hyper stimulation [12-14]. The objective of this study was to evaluate the efficacy and cost effectiveness of

misoprostol, compared with PgE2, for labour induction in women at term.

MATERIALS AND METHODS

The study was conducted at Gynecology and obstetrics department, Gajju Khan Medical College. Duration of the study was 6 months. Study design was randomized controlled trial. Inclusion criteria include Nulliparous and/or multiparous women admitted for the induction of labor at term (>37 weeks) (ii) singleton pregnancy with cephalic presentation and no contraindication to vaginal delivery (iii) unfavorable cervix (Bishop's<6); (iv) intact membranes (v) absence of active labor or fetal distress. Exclusion criteria included: (i) ruptured membranes (ii) previous cesarean delivery or history of uterine surgery; and (iii) cephalopelvic disproportion. Permission from the ethical committee of was taken for the study. Informed written consent for induction of labour was taken from all patients included in this study. The group was divided into two groups 1 and 2 random sampling using random table. Patients were randomized into 2 groups, each consisting of 60 patients. Patients in group 1 were induced with prostaglandin E2 vaginal pessary (3 mg), maximum 2 doses 6 hours apart. While patients in group 2 were induced with misoprostol i.e prostaglandin E1, given vaginally at a dose of 25 mcg 4 hourly, 4 doses maximum. A patient was labeled as failed induction if no improvement in Bishop Score was observed after 4 doses. Cardiotocograph was taken before and after insertion of each dose. Partogram was maintained in all cases as per the hospital protocol. Uterine contractions were monitored to detect hyper stimulation and tachysystole. Pelvic examination was mandatory before repeating the dose. Data was collected by means of questionnaire proforma. Data analysis was computer based. Data entry sheet was designed in SPSS version 22. There were 2 groups of patients. Data was presented in proportions (percentages) and means with SD. The 2 groups were compared using Chi Square test for quantitative variables (proportions) and t, test used to compare quantitative variables. The test of significance was taken at a p value <0.05.

RESULTS

120 patients were equally divided into two groups. The mean age of the patients was 31.35±5.82 years. The gestational age of participants in both age groups was 37 to 42 weeks with mean in group 1 was 39.23±1.46 weeks and in group 2 was 39.08±1.60 weeks. Mean gravidity in group 1 was 3.76±1.67 and group 2 was 3.80±1.61. Mean duration of labor in group 1 was 7.8±3.81 hours whereas in group 2 it was 6.50±3.35 hours. Post stratification independent sample t test was applied and p value was 0.158 which is not significant. 23.33% (14) patients were primigravida in group 1. 31.66% (19) were primigravida in group 2. 18.33% (11) LSCS were done in group 1 and 4(6.66%) in group 2. Oxytocin injection was given in 55% (33) patients in group 1 and 43.33% (26) in group 2. 25 % (15) patients in group 1 and 15 % (9) in group 2 were having duration of labor more than 10 hours.

Table No. 1: Age Group

Age Group	Group 1		Group 2	
	Frequency	%ages	Frequency	%ages
20-25	12	20%	10	16.66%
26-30	14	23.33%	18	30%
31-35	15	25%	12	20%
36-40	19	31.66	20	33.33%

Table No.2: Gravidity

Gravi-dity	Group 1		Group 2	
	Frequency	%ages	Frequency	%ages
1	14	23.33%	19	31.66%
2	12	20%	9	15%
≥3	34	56.66	32	53.33%

Table No. 3: LSCS

LSCS	Group 1		Group 2	
	Frequency	%ages	Frequency	%ages
Yes	11	18.33%	04	6.66%
No	49	81.66%	56	93.33%

Table No. 4: Duration of Labour

Duration of labour	Group 1		Group 2	
	Frequ-ency	%ages	Frequ-ency	%ages
<5 hrs	8	13.33%	17	28.33%
5-10 hrs	37	61.66%	34	56.66%
>10 hrs	15	25%	9	15%

DISCUSSION

Labour induction is the commonest intervention as far as obstetric is concerned[15].It is done when the fetal survival is an anticipated outcome and prolongation of gestation is not advisable for fetal or maternal wellbeing. The cervix ripening is the most important part of labour induction and predictor of success[1]. Prostaglandins play a critical role in cervical ripening by increasing inflammatory mediators in the cervix and inducing cervical remodeling supported by a number of randomized controlled trials. Prostaglandin E1 (PGE1) and prostaglandin E2 (PGE2) exert different effects on these processes and on myometrial contractility. These mechanistic differences may affect outcomes in women treated with dinoprostone, a formulation identical to endogenous PGE2, compared with misoprostol, a PGE1 analog[16]. Misoprostol, a strong uterotonic drug used primarily for induction of labour has been recently

studied even in the management of third stage of labour outside the United States. It is inexpensive, heat stable, stored at room temperature, does not require refrigeration and does not degrade in tropical climates[1]. Several clinical trials were carried out at Kingston General Hospital, Kingston, Ontario and elsewhere to compare the vaginal use of misoprostol for induction of labour with oral use of misoprostol. These studies suggested that vaginal use of misoprostol is more effective than oral administration, resulting in shorter induction-delivery interval and decrease need for oxytocin augmentation[17]. However, the difference in instrumental delivery rate and caesarian section rate was non-significant. As far as apgar scores were concerned there was no clinically significant difference seen between the two groups[18]. The current study was carried out to compare the results of misoprostol with prostaglandin E2 for induction of labour, in full term pregnancy. Although misoprostol use started in GKMC swabi one year ago, it has been used for the indication of labour, for cervical dilatation in cases of missed abortions and mid trimester abortions. In our study all our patients with successful labour induction delivered within 12 hours of induction, 28.33% of patients induced with misoprostol were delivered within 4 hours of induction while 13.33% in group with prostin tablet. Misoprostol is found more effective in induction of labour through vaginal route and maximum patients delivered in 5-10 hours i.e. 56.66%. The maximum patients in group-A i.e. 61.66% cases induced with prostin delivered in 5-10 hrs of induction. This study also showed that induction delivery interval is short in cases of misoprostol. These results are comparable with the study of Schroder et al[19]. Misoprostol is a useful drug for ripening of cervix and induction of labour. In cases of misoprostol i.e. group-B, maximum patients i.e. 93.33% delivered vaginally and 6.66% underwent LSCS. In group-A i.e. dinoprostone group 81.66% vaginal deliveries and 18.33% LSCS. Our study gave us results comparable with other studies and showed better results with misoprostol[20,21]. The priming of cervix to induction and induction to delivery intervals were also considerably shortened in cases of misoprostol and also delivery rate by LSCS was lowered in the misoprostol group. Apgar score at 5 minutes after birth was same in both groups. A number of studies carried out to compare the safety and efficacy of misoprostol for cervical ripening at term with dinoprostone. Garry et al[22] reported that intravaginal misoprostol and dinoprostone are safe and effective medications for use in cervical ripening before labour induction. Misoprostol results in a shorter interval from induction to delivery[1]. Moodley[23] concluded that in selected women, the efficacy of misoprostol for the induction of labour at term is similar to that of dinoprostone but misoprostol associated with a higher incidence of hyperstimulation[24]. There was no uterine hyperstimulation noted with any of the drug, used for induction. Limitations of Study We cannot use misoprostol for labour induction in grand multiparous and scarred uterus because of the hyperstimulation[24]. The effects of misoprostol on the fetus needs further investigation before it is used as routine agent for induction of labour.

CONCLUSION

Misoprostol PGE1 is a useful drug for labour induction. There is short induction delivery interval in case of PGE1 and also reduced need for the use of oxytocin augmentation. There are also less failure rates of induction with misoprostol and rates of instrumental delivery and lower segment caesarean section is also less. The cases should be properly selected for induction, carefully monitored during labour, to have better results and to avoid complications. It is also important to have more clinical experience.

Author's Contribution:

Concept & Design of Study:	Aneesa Sadiq
Drafting:	Zul-e-Huma
Data Analysis:	Surraya Israr
Revisiting Critically:	Aneesa Sadiq, Zul-e-Huma
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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