

Induction of Labour - Foley's Catheter versus Prostaglandin E2 Gel at JLNMCH, Bhagalpur, Bihar

Madhavi¹, Anupama Sinha²

¹Assistant Professor, Department of Obstetrics and Gynaecology, Jawaharlal Nehru Medical College and Hospital (JLNMCH), Bhagalpur, Bihar.

²Associate Professor, Department of Obstetrics and Gynaecology, Jawaharlal Nehru Medical College and Hospital (JLNMCH), Bhagalpur, Bihar.

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Corresponding author: Dr Madhavi

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Abstract

Background: The clinical definition of labour is the onset and continuation of uterine contraction with the intent of resulting in increasing cervical effacement and dilation. Prostaglandins are a great replacement for the Foley's catheter in the treatment of cervical ripening and labour induction. The aim of the study was to explore the outcomes for the mother and foetus in terms of delivery technique and Apgar score, as well as to evaluate the efficacy of the intracervical Foley's catheter and PGE2 gel as cervical ripening agents.

Methods: The Obstetrics and Gynecology Department at the Jawaharlal Nehru Medical College and Hospital in Bhagalpur, Bihar, was the site of this randomised controlled study. In order to compare the effectiveness of inducing labour using an intracervical Foley's catheter and PGE2 gel, 400 women with signs that they should be induced into labour were participated in the trial.

Results: Group A mean age was 24.59 ± 3.42 and group B was 24.28 ± 3.21 years. 95% of the women in group A and 97% of the women in group B were effectively induced. The two conditions that led to induction the most frequently in both groups were preeclampsia and postdatism. In groups A and B, the mean induction delivery interval was respectively 15.30 ± 4.63 hours and 15.96 ± 4.89 hours. In group A, 4.21% of cases required NICU admission, whereas 5.15% of cases did so in group B.

Conclusions: According to the results of our study, both the intracervical Foley's catheter and the intracervical PGE2 gel are equally effective for inducing labour, and they can be used in conjunction with one another.

Keywords: Labour, Foley's catheter, PGE2 gel, Vaginal delivery, Caesarean.

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Introduction

Regular uterine contractions that cause the cervix to enlarge and efface, together with deliberate efforts to bear down, result in normal labour, which causes the vaginal discharge of the foetus [1]. The clinical definition of labour is the onset and

continuation of uterine contraction with the intent of resulting in increasing cervical effacement and dilation. Before the commencement of spontaneous labor, uterine contractions (>3 in 10 minutes, each lasting for 30-45 seconds), cervical softening, and

effacement are induced by means of medical or surgical procedures. 50% of inductions at Asian facilities are voluntary, with Sri Lanka having the highest rate (77.2%). Thailand (44.6%), Japan (41.0%), India (32.1%), and China (20.4%) come in second and third, respectively. The lowest rates of labour induction are seen in African countries, with Nigeria having the lowest rate at 1.4%. Recently, the frequency of elective inductions has increased. One-fifth of all pregnancies are terminated using different induction procedures, according to ACOG [2]. A higher chance of caesarean delivery is linked to low bishop scores. Nulliparity, obesity, maternal age greater than 30, foetal macrosomia, use of epidural anaesthesia, use of magnesium sulphate, and chorioamnionitis are other factors that raise the chance of caesarean section after induction [3-5].

The degree of cervix ripening, which can be measured using a variety of scoring systems but is most frequently used in Bishop scoring, which takes into account cervical dilatation, cervix length, consistency, position, and station of the presenting part, determines whether an induced labour is successful. The favourable score is 6-13 [6-8], and the overall score is 13. In 1982, it was changed such that cervical length in centimetres, rather than percentage, was used to determine effacement.

Mechanical, surgical, pharmacological, and combination methods of induction of labour are the several types of induction of labour techniques. The purpose of the study was to assess the efficacy of the intracervical Foley's Catheter and PGE2 gel as cervical ripening agents and to look at how delivery technique and Apgar score affected mother and foetus outcomes.

Material and Methods

From 20th May 2019 to 20th March 2020, the current randomised controlled study was carried out in the Obstetrics and Gynecology

Department of the Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar. After meeting the inclusion and exclusion criteria, 400 women with signs of induction of labour were enrolled in the study. Written informed consent was obtained after the appropriate counselling was conducted. It was done to compare the intracervical Foley's Catheter with the frequently used agent PGE2 gel for labour induction in terms of safety, efficacy, and fetomaternal result. Individuals who were admitted to the labour department for labour induction were enrolled in the study.

400 women were divided randomly into two groups after giving their written, informed consent and meeting the inclusion and exclusion criteria through appropriate counselling and clinical evaluation. Details about the patient and a thorough history according to the proforma were recorded. To rule out any maternal diseases, a comprehensive general physical examination and systemic examination were performed. Bishop's score assignment and pelvic assessment were done through obstetrical and vaginal examination.

Group A : Foley's catheters were implanted intracervically in 200 individuals. 16 F. Foley's catheter was inserted through the internal OS as a precaution against aseptic contamination, and its balloon was inflated with 30–60 ml sterile water. The distal end of the catheter was taped to the medial thigh to provide traction. Every 4-6 hours, the catheter's location and traction were examined. If the intracervical catheter isn't evacuated after 24 hours, it was withdrawn.

Group B : 200 individuals received 0.5 mg of PGE2 gel under completely sterile circumstances. While the patient was in the lithotomy position, PGE2 Gel was injected intracervically, and the patient was instructed to rest for 30 minutes. Bishop's score was evaluated, and if necessary, the dose was

repeated when the patient was evaluated again after 12 hours and once more after 24 hours.

Chi square statistics were used for the statistical analysis, compilation, and comparison of the acquired data. Version 22 of IBM Software Excel and SPSS (Statistical Program for Social Sciences) were employed.

Results

The majority of the participants in both study groups were between the ages of 21 and 25. Group A mean age was 24.59 ± 3.42 and group B was 24.28 ± 3.21 years. With a p value of 0.719, the result was not statistically

significant. In group A, 72% of patients were primigravida, 28% were multigravida, and in group B, 58% were primigravida, 42% were multigravida. A non-significant p value of 0.495 was obtained (Table 1). The modified Kuppuswamy scale indicated that group A (54%) and group B (48%) of the patients were primarily from lower socioeconomic statuses. The p value of 0.177 was once more insignificant (Table 1). In group A, the mean gestational age was 39.63 ± 1.78 weeks, while in group B, it was 39.69 ± 1.79 weeks. The subjects were relatively evenly distributed between the two groups, and the p value was 0.179, which was not significant (Table 1).

Table 1: Maternal characteristics of Group A and B

Characteristics	Group A		Group B		p-value
	No. of cases	Percentage	No. of cases	Percentage	
Age (years)					0.719 NS (Not significant)
16-20	14	7%	30	15%	
21-25	126	63%	108	54%	
26-30	48	24%	54	27%	
31-35	12	6%	8	4%	
Mean \pm SD	24.59 ± 3.42		24.28 ± 3.21		
Parity					
Primigravida	144	72%	116	58%	0.495 NS
Multigravida	56	28%	84	42%	
Socioeconomic Status					
Lower	108	54%	96	48%	0.179 NS
Middle	88	44%	90	45%	
Higher	4	2%	14	7%	

In group A, preeclampsia was the most frequent reason for inducing labour (40%) while in group B, postdatism was the most frequent reason (33%). Preeclampsia (32%) and postdated pregnancy (29%) were the two second-most frequent indicators in groups A and B, respectively (Table 2).

Table 2: Indications of labour induction of Group A and B

Indication for induction	Group A		Group B	
	No. of cases	Percentage	No. of cases	Percentage
Antepartum eclampsia	16	8%	22	11%
Congenital Anomaly	2	1%	8	4%
Deranged Colour Doppler	8	4%	6	3%
Fetal Growth Restriction	10	5%	12	6%
Gestational Diabetes Millitus	4	2%	2	1%
Intrahepatic Cholestasis of Pregnancy	2	1%	0	0

Intrahepatic fetal death	8	4%	12	6%
Oligohydraminos	10	5%	8	4%
Post datism	58	29%	66	33%
Pre-eclampsia	80	40%	64	32%
Polyhydramnios	2	1%	0	0

Both 97% and 95% of the women in groups A and B were successfully induced. Both 5% and 3% of the women in groups A and B experienced induction failure, necessitating caesarean sections in each case. The outcome was not statistically significant with a p value of 0.48. (Table 3). The majority of the 190 women who underwent successful induction gave birth vaginally, with 84.21%, while 15.79% required a caesarean delivery due to foetal distress, alcohol tainted with meconium, or a lack of labour progress. In group B, vaginal birth occurred in 79.38% of cases, while caesarean sections were performed in 20.62% of cases despite intense uterine contractions due to foetal distress, meconium-tainted alcohol, or labour that did not progress as expected. Considering that the p value was 0.496, it was not significant.

In fewer than 12 hours, about 28.42% of group A participants and 26.80% of group B individuals gave birth. The mean time between inductions in group A was 15.30±4.33 and 15.96±4.89 hours. The p value of 0.355 was not significant, according to statistics. (Table 3).

Table 3: Results of induction of Group A and B

Characteristics	Group A		Group B		p-value
	No. of cases	Percentage	No. of cases	Percentage	
Successful induction	190	95%	194	97%	0.48
Failed induction	10	5%	6	3%	NS
Mode of delivery					
Vaginal delivery	160	84.21%	154	79.38%	0.496
Caesarean section	30	15.79%	40	20.62%	NS
Induction delivery interval (in in hours)					
6-12	27	28.42%	52	26.80%	0.355
>12-18	36	37.89%	62	31.96%	NS
18-24	32	33.68%	80	41.24%	
Mean induction delivery time	15.20±4.53		15.86±4.79		

Fetal distress was the most frequent cause of LSCS in both groups (40%). Due to meconium-stained liquor, caesarean sections were also frequently indicated in 26.6% and 35% of cases in each group, respectively. In group A 2.04% of cases and group B 6.06%, hypertonicity was noted. Some less frequent complications include postpartum haemorrhage, chills, nausea, vomiting, and infections. (Table 4).

Table 4: Caesarean section indication and maternal side effects of Group A and B

Indication for caesarean	Group A		Group B	
	No. of cases	Percentage	No. of cases	Percentage
Meconium stained labour	8	26.6%	14	35%
Non progress of labour	6	20%	10	25%
Severe preeclampsia with HELLP	4	13.33%	0	0
Fetal distress	12	40%	16	40%

Side effects				
• Hypertonic uterus	4	2.04%	12	6.06%
• Nausea	6	3.06%	10	5.05%
• Postpartum haemorrhage	2	1.02%	4	2.02%
• Infection	4	2.04%	2	1.01%
• Fever, shivering	4	2.04%	4	2.04%
• Vomiting	6	3.06%	12	6.06%

Fetal distress was experienced by 6.32% of neonates in group A and 8.25% of neonates in group B. Neonatal jaundice affected 4.21% of newborns in group A compared to 3.09% of those in group B. Both groups of neonates developed meconium aspiration syndrome in about 2% of cases. In group A, 4.21% of cases required NICU admission, whereas 5.15% of cases did so in group B. The p-value of 0.239 was not significant, according to statistics. At one minute, the APGAR <7 rate was 5.2% in group A and 7.2% in group B, and the p-value was 0.579, which was not statistically significant. In group A, the APGAR <7 at 5 minutes was 2.1%, while in group B, it was 3.09%. It had a p-value of 0.678, making it statistically insignificant. (Table 5).

Table 5: Neonatal complications and Apgar score of Group A and B

Neonatal complications	Group A		Group B		p-value
	No. of cases	Percentage	No. of cases	Percentage	
Foetal distress	12	6.32%	16	8.25%	0.239 NS
Neonatal jaundice	8	4.21%	6	3.09%	
Meconium aspiration	4	2.11%	4	2.06%	
NICU Admission	8	4.21%	10	5.15%	
Apgar score at 1 min.					0.579 NS
• <7	10	5.2%	14	7.2%	
• >7	180	94.7%	180	92.7%	
Apgar score at 5 min.					0.678 NS
• <7	4	2.1%	6	3.09%	
• >7	186	97.8%	190	97.9%	

Discussion

Prolonged labour and a higher rate of caesarean sections are caused by an unfavourable cervix during labour induction. When compared to the study of Dr. V Revathi, where the mean bishop score was 2.60±1.55 in group A and 2.86±1.57 in group B, it was discovered that the mean bishop score in group A in our study was 3.13±0.87 and in group B was 3.36±0.91 [9]. Preeclampsia, which was the key factor in 40% of Group A women's induction of labour and in 29% of those same women's post-dating of pregnancy, and in 32% of Group B

women and 33% of those same women's induction of labor, was comparable to studies by Anjumam Alam and Deshmukh V.L.7 [13], The median interval between inductions in Group A was 15.30±4.63 hours, whereas it was 15.96±4.89 hours in Group B. This reveals that an equivalent induction delivery period was experienced by all participants who were induced using an intracerebral catheter and PGE2 gel.

The current study supports earlier research by Sunita Murmu and Deshmukh, as well as findings from numerous other studies that

this interval was about identical in both groups [4,13]. In the current study, the incidence of vaginal delivery was 84.21%, and the incidence of caesarean delivery was 15.79% in Group A.

These numbers were comparable to those in studies by Laddad (82.5 and 17.5%, respectively), Dharmavijaya (86% and 14%), and Sunita Murmu (84.3 and 15.7%, respectively) [4,10,16].

In comparison to other research, the number of NICU admissions in groups A and B was lower (4.21% and 5.15%, respectively). According to Manisha Laddad, Dharmavijaya, and Deshmukh's investigations, complications such foetal distress and meconium aspiration syndrome were approximately equally common in both groups [10,13,16].

The foetal outcome with an apgar score of <7 at one minute was comparable to other studies; it was 10% in Dharmavijaya's study, 7.1% in Sunita Murmu's study, and 5.2% in the current study in group A. That was equivalent to several studies in group B, which had 7.2% in our study, 8.6% from Sunita Murmu, and 11% from Dharmavijaya. The foetal outcome with an Apgar score of <7 at 5 minutes was 1% in Revathi's trial in group A, which was identical to our research's (2.1%). It was lower than in the current study at 7.5% in Deshmukh's study and 7% in Anjuman Alam's study. In the current study's group B, the outcome with an Apgar score of <7 at 5 minutes was 3.09%, but in the studies by Deshmukh and Sanjay Patil, it was 8% [17].

Conclusion

According to the findings of our study, there is no distinction between the effectiveness of an intracervical Foley's catheter and an intracervical PGE2 gel for inducing labour. Additional factors that were comparable across the two groups included the mother's

and neonatal outcomes as well as the induction delivery interval. The two strategies complement one another effectively.

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