

Efficacy of controlled-release dinoprostone vaginal tablet for elective induction of labor

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Abstract

Objective: Induction of labor before due date in low-risk women has been proved to reduce the rate of Cesarean section. Controlled-release dinoprostone (PGE₂) vaginal tablet has recently been approved to use in Japan, however, the information about its efficacy in labor induction before due date is still limited. In our institution, planned vaginal delivery before 40 weeks' gestation has been promoted after COVID-19 pandemic in 2020. Hence, this study aimed to compare the efficacy of PGE₂ and metreurynter/laminaria tent for labor induction before 40 weeks' gestation.

Design: Case control study

Method: This retrospective study included 240 pregnant women at 37, 38 and 39 weeks gestation who delivered in our institution from January 2021 to October 2022. Women with prelabor rupture of membranes, epidural anesthesia, hypertensive disorders in pregnancy, gestational diabetes and medicated for threatened preterm delivery were excluded. Maternal background, perinatal outcomes and success rate of vaginal delivery were compared between PGE₂ group (n=52) and metreurynter/laminaria tent (non-PGE₂) group (n=188). The success rate of vaginal delivery was defined as the proportion of women who delivered vaginally within 48 hours after initiating oxytocin augmentation.

Results: Maternal age, parity, pre-pregnancy BMI, gestational weight gain, gestational age and bishop score at cervical ripening, birth weight and umbilical artery pH were not significantly different between the two groups. The success rate of vaginal delivery was significantly higher in the PGE₂ group (39/52, 75%) compared with the non-PGE₂ group (88/188, 47%) (p < 0.01). Emergency Cesarean section related to non-reassuring fetal status was performed with none in the PGE₂ group, while 4 cases (2.1%) in the non-PGE₂ group.

Conclusions: The rate of vaginal delivery was significantly higher in the PGE₂ group as compared to non-PGE₂ group between 37 and 39 weeks gestation. PGE₂ could increase the success rate of vaginal delivery for elective induction of labor before due date.

Objectives

- Induction of labor before due date in low-risk women has been proved to reduce the rate of Cesarean section.
- Controlled-release dinoprostone (PGE₂) vaginal tablet has recently been approved to use in Japan, however, the information about its efficacy in labor induction before due date is still limited.
- In our institution, planned vaginal delivery (VD) before 40 weeks' gestation has been promoted after COVID-19 pandemic in 2020.
- This study aimed to compare the efficacy of PGE₂ and metreurynter / laminaria tent for labor induction before 40 weeks' gestation.

Study Design

Study design : Retrospective study
Period : January 2021 to October 2022
Subjects : 240 singleton pregnancies with unfavorable cervix
Induction of labor between 37 and 40 weeks

Excluded

- Prelabor rupture of membrane
- Hypertensive disorders in pregnancy
- Gestational diabetes mellitus

Table 1. Maternal characteristics and perinatal characteristics

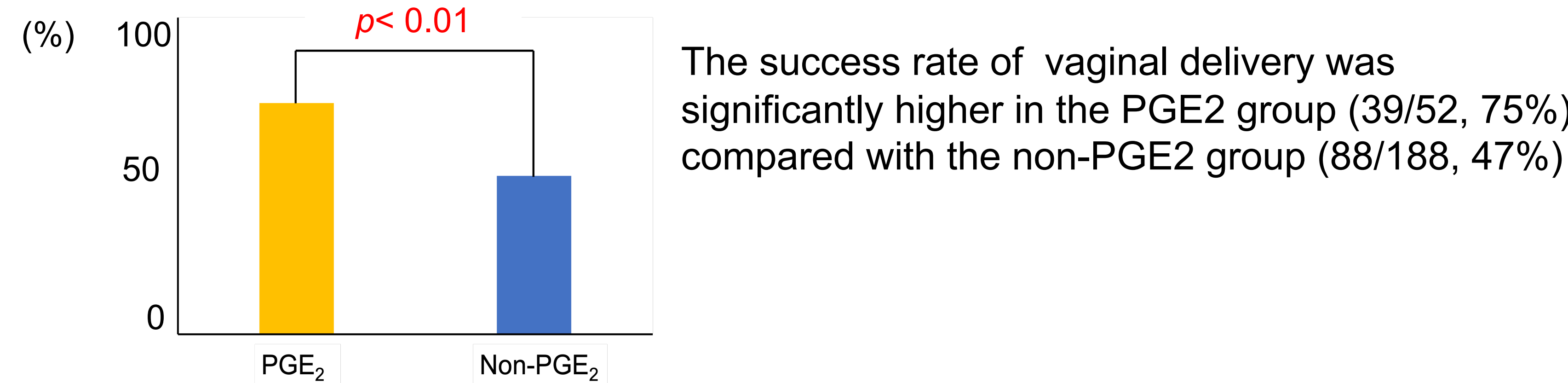
Characteristic	PGE ₂ group (N = 52)	Non-PGE ₂ group (N = 188)	p value
Maternal age (years)	34.8 ± 4.7	34.2 ± 4.6	0.45
Pre-pregnancy BMI (kg/m ²)	20.2 ± 3.7	21.1 ± 3.3	0.08
Primiparous	41 (79%)	144 (77%)	0.44
Method of conception			0.23
Natural insemination	39 (75%)	131 (70%)	
IVF-ET	13 (25%)	46 (24%)	
Gestational weeks at delivery	39.1± 0.66	38.8 ± 0.71	0.01
Birth weight (g)	3083 ± 327	3051 ± 302	0.50
Apgar score (1 minute)	8.1 ± 0.6	7.8 ± 1.2	0.09
Apgar score (5 minutes)	8.9 ± 0.5	8.7 ± 0.7	0.05
Umbilical artery blood pH	7.30± 0.04	7.30 ± 0.05	0.86

Table 2. Cervical dilation and Bishop score before cervical ripening

	PGE ₂ group (N=52)	Non-PGE ₂ group (N=188)	p value
Cervical dilatation (cm)	1.0 ± 0.7	1.3 ± 1.0	0.03
Bishop score	1.9 ± 1.5	2.0 ± 1.6	0.63

Results

Figure 3. The success rate of vaginal delivery



The success rate of vaginal delivery was significantly higher in the PGE₂ group (39/52, 75%) compared with the non-PGE₂ group (88/188, 47%) .

Discussion

Table 4. Summarize the previous studies that use PGE2 for cervical ripening

	N	Gestational age at cervical ripening (mean)	Success rate of VD		p value
			PGE ₂ group	non-PGE ₂ group	
Itoh H. et al. (JOGR. 2021)	113	41 wk (41.2)	81.3%	86.1%	0.55
Gupta JK. et al. (AJOG MFM. 2022)	674	37 – 41 wk (N/A, post term 37%)	65.7%	62.6%	0.33
Yamaguchi M. et al. (JOGR. 2021)	117	37 – 41 wk (39.4)	82.3%	57.6%	< 0.01
Present study	240	37 – 39 wk (39.1)	75%	47%	< 0.01

PGE₂ may provide benefit for induction of labor before 40 weeks

Conclusion

- The rate of vaginal delivery was significantly higher in the PGE₂ group as compared to non-PGE₂ group between 37 and 39 weeks gestation.
- PGE₂ could increase the success rate of vaginal delivery for elective induction of labor before due date.

References

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The success rate of VD was compared between two groups.

↳ The proportion of women who delivered vaginally ≤ 48 hours after starting oxytocin