

Application Effect of Phloroglucinol Combined with Lamaze Breathing Method and Doula in Promoting Natural Delivery

Dan Xue*

Changzhou Hospital of Traditional Chinese Medicine, Changzhou 213000, Jiangsu, China

*Author to whom correspondence should be addressed.

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Abstract: *Objective:* To explore the application effect of phloroglucinol combined with the Lamaze breathing method and doula in promoting natural delivery. *Methods:* From April 2022 to April 2024, 110 full-term singleton cephalic presentation natural delivery parturients were randomly divided into 2 groups, with 55 cases in each group. The control group received the Lamaze breathing method and doula delivery, while the observation group received phloroglucinol-assisted delivery in addition to the above methods. The duration of labor, pain degree, postpartum bleeding volume, and maternal and infant outcomes were compared between the two groups. *Results:* The duration of the first, second, third, and total labor in the observation group was shorter than that in the control group, and the pain degree during labor was less than that in the control group. The postpartum 2-hour bleeding volume and postpartum 24-hour bleeding volume in the observation group were less than those in the control group ($P < 0.05$). The cesarean section rate, soft birth canal injury rate, postpartum bleeding rate, and urinary retention rate in the observation group were 3.64%, 5.45%, 1.82%, and 5.45% respectively, which were lower than those in the control group (18.18%, 20.00%, 14.55%, and 18.18%) ($P < 0.05$); there was no statistical significance in the comparison of intrauterine distress and neonatal asphyxia between the two groups ($P > 0.05$). *Conclusion:* Implementing phloroglucinol combined with the Lamaze breathing method and doula delivery in natural delivery can shorten the labor duration, reduce labor pain, reduce postpartum bleeding volume and related complications, and have no effect on the newborn, with high safety, and is worthy of promotion.

Keywords: Natural delivery; Phloroglucinol; Lamaze breathing method; Doula delivery; Labor duration; Pain degree

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1. Introduction

In recent years, the rate of cesarean section has remained high in China. Although the country has vigorously advocated natural childbirth, many pregnant women still choose cesarean section due to various factors. This not only leaves scars but also leads to excessive postpartum bleeding, slow recovery, and an increased risk of

complications. Therefore, reliable measures need to be taken to promote natural childbirth as much as possible ^[1]. Many pregnant women have natural childbirth indications, but they are forced to undergo cesarean section due to their poor tolerance to pain during the early stage of labor, strong stress responses, and negative emotions, which increase the difficulty of delivery. Therefore, the control of labor pain needs to be emphasized ^[2]. The conventional methods of using Lamaze breathing and doula-assisted childbirth to alleviate labor pain and promote the smooth progress of labor are still insufficient, and the pain relief effect is limited ^[3]. Indirubin, as a drug for relieving acute pain, effectively relieves muscle and smooth muscle spasms, but its effectiveness in natural childbirth when applied needs further research ^[4]. Therefore, this study explores the application effect of indirubin combined with Lamaze breathing and doula in promoting natural childbirth. 100 cases of natural delivery mothers admitted to the hospital from April 2022 to April 2024 were selected for the study as follows.

2. Materials and methods

2.1. General information

From April 2022 to April 2024, 110 cases of full-term singleton cephalic presentation natural delivery mothers were randomly divided into 2 groups, with 55 cases in each group.

Inclusion criteria: The mothers were married, with a full-term singleton cephalic presentation after examination, with an estimated fetal weight of less than 4000 g; normal female pelvis, with a head-pelvis score of more than 7 points, normal physiological indicators, and meeting the natural childbirth indications; the mothers voluntarily signed an informed consent form.

Exclusion criteria: Abnormal fetal position, cephalopelvic disproportion, and abnormal fetal conditions; mothers with a history of cesarean section and postpartum hemorrhage; mothers with important organ functional diseases such as the kidney, heart, liver, etc.; pregnant women with coagulation disorders; mothers with mental disorders or cognitive impairments.

The control group was aged 20–37 years old, with an average age of (27.16 ± 3.45) years old, gestational age of 37–41 weeks, with an average gestational age of (39.05 ± 0.84) weeks, weight of 60 kg–76 kg, with an average weight of (69.02 ± 5.18) kg, with 35 primiparas and 20 multiparas; the observation group was aged 21–37 years old, with an average age of (27.32 ± 3.57) years old, gestational age of 37–41 weeks, with an average gestational age of (39.12 ± 0.86) weeks, weight of 60 kg–75 kg, with an average weight of (69.22 ± 5.08) kg, with 33 primiparas and 22 multiparas; there was no statistically significant difference in the basic data between the two groups ($P > 0.05$), and they could be compared for the study.

2.2. Methods

2.2.1. Control group

The Lamaze breathing method and doula-assisted delivery were adopted. The specific procedures were as follows:

- (1) Pre-delivery guidance: The doula provided continuous accompaniment throughout the process, patiently explained the importance of natural childbirth, informed about appropriate midwifery techniques, breathing techniques of Lamaze, and other methods, and provided emotional comfort and positive encouragement to enhance the puerpera's confidence in natural childbirth. The puerpera was guided to have proper pre-delivery nutrition and maintain sufficient physical strength.
- (2) First stage of labor: During the latent phase, the puerpera was instructed to breathe correctly. After contractions, the puerpera was guided to take deep breaths and exhale slowly at a slow rhythm. After

the contractions ended, the puerpera resumed the normal breathing rhythm. In the active acceleration stage, the puerpera was instructed to accelerate the breathing rhythm. After contractions, the puerpera opened their mouth to breathe, adjusting the breathing rate according to the frequency of contractions, and resumed deep breathing when the contractions slowed down. In the active deceleration stage, the puerpera maintained shallow breathing until the contractions ended.

- (3) Doula-assisted delivery: When the cervical opening reached 3 cm, the delivery pain doula device was placed appropriately, the current intensity was adjusted to a mild muscle tremor, and the discomfort was inquired about until the cervical opening was fully dilated.
- (4) Second stage of labor: After entering the second stage of labor, the puerpera began to forcefully inhale and hold their breath for 20–30 seconds, then pushed downward. This cycle was repeated until 2/3 of the fetal head was delivered. During the contractions, the puerpera took rapid, panting breaths, and held their breath and exerted force during the intervals between contractions. After the successful delivery of the fetus, maternal-infant contact and breastfeeding were completed as soon as possible.

2.2.2. Observation group

On the basis of the above Lamaze breathing method and doula-assisted delivery, indigo carmine (Nanjing Hengsheng Pharmaceutical Co. Ltd., National Drug Approval Number H20046766, specification: 4 mL: 40 mg) was used as an auxiliary method for delivery. When the cervical opening reached 3 cm, 40 mg of indigo carmine was intravenously injected, and 40 mg was injected again during the active stage.

2.3. Observation indicators

2.3.1. Comparison of labor parameters and outcomes between groups

Compare the first stage of labor, second stage of labor, third stage of labor, total labor duration, degree of labor pain, 2-hour postpartum bleeding volume, 24-hour postpartum bleeding volume between the two groups; The degree of pain was evaluated using the Visual Analogue Scale (VAS), ranging from 0 (no pain) to 10 (extreme pain); The bleeding volume = (wet weight of the blood collection dressing - dry weight of the blood collection dressing before) / 1.05.

2.3.2. Comparison of maternal and fetal outcomes between the two groups

Compare the maternal outcomes of the two groups, including cesarean section, soft birth canal injury, postpartum bleeding, and urinary retention. The fetal outcome was intrauterine distress, neonatal asphyxia, etc.

2.4. Statistical analysis

Data were processed using SPSS 24.0. Quantitative data were analyzed using a *t*-test, and were expressed as mean $\pm$ standard deviation (SD). Count data were analyzed using chi-square test, and were expressed as [*n* (%)]. *P* < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of labor duration, labor pain, and postpartum bleeding volume between the two groups

As shown in **Table 1**, the first stage of labor, the second stage of labor, the third stage of labor, total labor duration,

degree of labor pain, 2-hour postpartum bleeding volume, and 24-hour postpartum bleeding volume in the observation group were all lower than those in the control group ($P < 0.05$).

Table 1. Comparison of labor duration, pain during delivery, and postpartum blood loss between the two groups (mean $\pm$ SD)

Group	Number of cases	First stage of labor (minutes)	Second stage of labor (minutes)	Third stage of labor (minutes)	Total labor duration (minutes)	Labor pain degree during delivery	Postpartum 2-hour bleeding volume (mL)	Postpartum 24-hour bleeding volume (mL)
Observation group	55	472.56 $\pm$ 52.63	60.43 $\pm$ 8.08	6.33 $\pm$ 1.35	540.63 $\pm$ 140.58	5.43 $\pm$ 1.22	135.25 $\pm$ 40.48	244.96 $\pm$ 50.65
Control group	55	544.28 $\pm$ 84.18	78.19 $\pm$ 12.29	12.52 $\pm$ 2.83	640.18 $\pm$ 170.43	8.22 $\pm$ 1.81	203.19 $\pm$ 55.27	330.29 $\pm$ 75.86
<i>t</i>	--	5.357	8.954	14.640	3.341	9.479	7.354	6.937
<i>P</i>	--	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001

3.2. Comparison of maternal and infant outcomes

As shown in **Table 2**, the cesarean section rate, soft birth canal injury rate, postpartum hemorrhage rate, and urinary retention rate of the observation group were 3.64%, 5.45%, 1.82%, and 5.45% respectively, which were lower than those of the control group (18.18%, 20.00%, 14.55%, and 18.18%) ($P < 0.05$); there was no statistically significant difference in the comparison of intrauterine distress and neonatal asphyxia between the two groups ($P > 0.05$).

Table 2. Comparison of maternal and infant outcomes [n (%)]

Group	Number of cases	Caesarean section	Soft birth canal injury	postpartum hemorrhage	Uroschesis	Intrusive pressure within the womb	Neonatal asphyxia
Observation group	55	2 (3.64)	3 (5.45)	1 (1.82)	3 (5.45)	1 (1.82)	0 (0.00)
Control group	55	10 (18.18)	11 (20.00)	8 (14.55)	10 (18.18)	4 (7.27)	2 (2.64)
χ^2	--	5.986	5.238	4.356	4.274	0.838	0.509
<i>P</i>	--	0.014	0.022	0.036	0.038	0.359	0.475

4. Discussion

Natural childbirth for mothers is a normal physiological phenomenon. During the childbirth process, the uterus contracts to facilitate the descent of the fetus and its delivery through the vagina. Moreover, natural childbirth helps the baby's lungs and brain develop, and is beneficial for the mother's postpartum recovery^[5]. However, mothers may experience severe pain due to contractions, perineal expansion, and pelvic deformation, which prevent them from continuing with natural childbirth. They may choose cesarean section instead, increasing the risks of postpartum bleeding and urinary retention, and this is not conducive to postpartum recovery^[6]. To enable mothers to have a natural childbirth in a relatively comfortable state, reliable measures such as the Lamaze breathing method and doula-assisted childbirth should be adopted to alleviate the degree of pain during childbirth. However,

the analgesic effect is limited, so other methods should be further employed for pain relief. The results of this study show that the duration of labor, pain level, and postpartum bleeding volume in the observation group are lower than those in the control group, suggesting that the combination of phloroglucinol^[7], Lamaze breathing method, and doula-assisted childbirth can accelerate the labor process, reduce the degree of pain during childbirth, facilitate the mother's smooth delivery, promote postpartum recovery, and reduce the amount of postpartum bleeding^[8]. This is consistent with the results of Peng^[9]. The Lamaze breathing method, as a commonly used method for pain relief and assistance during natural childbirth, can adjust the correct breathing method according to the progress of labor, divert the mother's attention, improve pain tolerance, promote coordinated uterine contractions, facilitate cervical dilation, reduce physical exertion, and facilitate fetal delivery^[10].

Doula-assisted childbirth utilizes non-pharmacological methods of labor pain relief, adjusting the current intensity and mobilizing the pain-blocking substance enkephalin to block the transmission pathway of pain information in the central nervous system, thereby achieving analgesic effects. Phloroglucinol can effectively alleviate the degree of pain during the childbirth process. After injection, it can act on the smooth muscles of the gastrointestinal tract and reproductive organs^[11], relieve the spasm and contraction of the smooth muscles, and reduce the degree of pain during the childbirth process^[12]. After the mother receives the injection, the pain level can be significantly reduced, the muscles can be relaxed, and she can exert force correctly under the guidance of the midwife, promoting fetal delivery, shortening the labor process, and reducing the amount of bleeding^[13]. The number of cesarean sections, soft birth canal injuries, postpartum bleeding, and urinary retention in the observation group is lower than that in the control group, suggesting that the combination of phloroglucinol, Lamaze breathing method, and doula-assisted childbirth is beneficial for natural childbirth of mothers, reduces related complications, and the drugs have no effect on the newborn. This is consistent with the results of Li^[14]. Phloroglucinol, the Lamaze breathing method, and doula-assisted childbirth act through different mechanisms to alleviate the degree of pain during childbirth, facilitate the smooth delivery of the fetus, avoid cesarean section, and reduce related complications. Moreover, the reasonable control of the dosage of phloroglucinol will not affect the health of the newborn^[15].

5. Conclusion

In conclusion, the application of phloroglucinol, the Lamaze breathing method, and doula-assisted childbirth in natural childbirth can shorten the labor process, alleviate the degree of pain during childbirth, protect the safety of both the mother and the baby, and have no effect on the newborn. It is worthy of promotion.

Disclosure statement

The author declares no conflict of interest.

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