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Delivery Modes and Their Effects on Mothers and Neonates in Cases of Repeat Pregnancy with Uterine Scars

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Abstract: *Objective:* To investigate the delivery modes of women with repeat pregnancies involving uterine scars and their effects on both mothers and neonates. *Methods:* A study was conducted on 100 patients treated at Shenzhen Maternity and Child Healthcare Hospital from July 2023 to July 2024. The participants were divided into a control group and an observation group, with 50 cases in each. The division was based on the indications for prior cesarean section, cervical maturity, postpartum complications, and thickness of the cesarean scar. The control group underwent cesarean delivery, while the observation group experienced vaginal delivery. The two groups were compared in terms of intrapartum blood loss, postpartum blood loss within 2 hours, length of hospital stay, Apgar scores at 1-minute post-birth, and incidences of neonatal fever and jaundice. *Results:* The observation group had significantly lower intrapartum blood loss, postpartum blood loss within 2 hours, and shorter hospital stays compared to the control group ($P < 0.05$). Additionally, the Apgar scores at 1 minute post-birth were significantly higher in the observation group ($P < 0.05$). The incidence of neonatal fever and jaundice was significantly lower in the observation group ($P < 0.05$). These differences were statistically significant. *Conclusion:* Vaginal delivery has high clinical value for women with repeat pregnancies involving uterine scars. It reduces maternal intrapartum and postpartum blood loss, shortens hospital stays, improves neonatal Apgar scores, and decreases the incidences of neonatal fever and jaundice. This method is worthy of clinical application and promotion.

Keywords: Uterine scars; Repeat pregnancy; Delivery mode; Cesarean section; Vaginal delivery

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1. Introduction

Uterine scars result from pathological changes in tissue appearance following maternal trauma. With the implementation of China's two-child policy [1], the cesarean delivery rate has risen significantly, leading to an increasing prevalence of uterine scars. Uterine scars compress the uterine blood vessels and nerves, altering the uterine structure and hindering normal fetal development [2]. Therefore, the choice of delivery mode in cases of

uterine scars is crucial for both maternal and neonatal outcomes [3].

Although vaginal delivery carries certain risks, such as uterine rupture, in cases of uterine scars [4], cesarean delivery is not an absolute indication of repeat pregnancies. Vaginal delivery offers its own advantages [5]. This study aims to clarify the impact of different delivery modes on mothers with uterine scars during repeat pregnancies. A total of 100 patients treated at Shenzhen Maternity and Child Healthcare Hospital between July 2023 and July 2024 were analyzed, with the findings detailed as follows.

2. Materials and methods

2.1. General information

A study was conducted on 100 patients treated at Shenzhen Maternity and Child Healthcare Hospital between July 2023 and July 2024. The patients were divided into a control group and an observation group based on indications for the previous cesarean section, cervical maturity, postpartum complications, and cesarean scar thickness.

In the control group, ages ranged from 22 to 33 years, with an average age of (26.85 ± 3.30) years. Gestational periods ranged from 37 to 40 weeks, with an average gestational period of (38.50 ± 1.23) weeks. In the observation group, ages ranged from 21 to 34 years, with an average age of (26.74 ± 3.62) years. Gestational periods ranged from 37 to 44 weeks, with an average gestational period of (38.63 ± 1.31) weeks. Statistical analysis showed no significant differences in general information between the two groups.

Inclusion criteria: (1) Diagnosed at our hospital with uterine scars according to diagnostic standards [6]; (2) Second pregnancy; (3) Confirmed singleton pregnancy via ultrasound examination; (4) High compliance with treatment by the patient and family, and informed consent signed to voluntarily participate in the study.

Exclusion criteria: (1) Concurrent liver or kidney dysfunction; (2) Concurrent heart or lung dysfunction; (3) Coagulation disorders; (4) First pregnancy.

2.2. Methods

The delivery mode was chosen based on indications from the first cesarean section, cervical maturity, postpartum complications, and cesarean scar thickness.

Vaginal trial delivery criteria: For vaginal delivery trials, the interval between the current and previous deliveries was required to be >2 years, the previous cesarean section involved a lower uterine segment incision, no other complications or abnormalities were present, and uterine continuity was deemed good. Upon obtaining consent from the patient and family, vaginal trial delivery was conducted.

Cesarean section criteria: For cesarean section, the interval between deliveries was ≤ 2 years and surgical indications for cesarean section were present. Additionally, if poor scar healing, significant infection, or other contraindications for vaginal delivery were noted during the previous cesarean section, cesarean delivery was performed. Ultrasound examinations revealing thin lower uterine walls also warranted cesarean delivery, subject to the consent of the patient and family.

2.3. Observation indicators

The study used the following observational indicators: surgical metrics, Apgar scores at 1-minute post-birth, and incidences of neonatal fever and jaundice. Specific details are as follows:

(1) Surgical metrics: Surgical metrics included intrapartum blood loss, postpartum blood loss within 2 hours, and length of hospital stay. These were recorded directly and used to compare data between the control and observation groups.

(2) Apgar scores at 1 minute post-birth: The Apgar score assessed neonatal asphyxia, with scores ranging from 0 to 10. Lower scores indicated more severe asphyxia.

(3) Incidence of neonatal fever and jaundice: Neonatal fever and jaundice during hospitalization were directly recorded, and their incidence rates were calculated as follows:

Fever incidence rate = (number of fever cases / total cases) × 100%

Jaundice incidence rate = (number of jaundice cases / total cases) × 100%

2.4. Statistical methods

Data were analyzed using SPSS 22.00 statistical software. Measurement data were expressed as mean ± standard deviation (SD) and analyzed with *t*-tests. Count data were expressed as [*n* (%)] and analyzed using χ^2 tests. A P value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of surgical metrics between the two groups

This study found that the observation group had significantly lower intrapartum blood loss, postpartum blood loss within 2 hours, and length of hospital stay compared to the control group ($P < 0.05$), as detailed in **Table 1**.

Table 1. Comparison of surgical metrics between the two groups (mean ± SD)

Group	*n*	Intrapartum blood loss (mL)	Postpartum blood loss (mL, within 2 hours)	Length of hospital stay (days)
Control group	50	1,123.25 ± 185.56	332.84 ± 82.60	12.84 ± 2.56
Observation group	50	702.64 ± 100.30	142.87 ± 30.85	7.34 ± 1.38
t	-	14.100	15.235	13.373
P	-	< 0.001	< 0.001	< 0.001

3.2. Comparison of neonatal Apgar scores at 1 minute post-birth between the two groups

The results indicated that the neonatal Apgar scores at 1 minute post-birth were significantly higher in the observation group compared to the control group ($P < 0.001$), as shown in **Table 2**.

Table 2. Comparison of neonatal Apgar scores at 1-minute post-birth between the two groups (mean ± SD)

Group	*n*	Apgar score
Control group	50	6.24 ± 1.56
Observation group	50	7.69 ± 1.80
t	-	4.305
P	-	< 0.001

3.3. Comparison of neonatal postpartum fever and jaundice incidence rates between the two groups

The study results showed that the incidence rates of neonatal postpartum fever and jaundice were significantly lower in the observation group compared to the control group ($P < 0.05$). The results are detailed in **Table 3**.

Table 3. Comparison of neonatal postpartum fever and jaundice incidence rates between the two groups

Group	*n*	Fever incidence rate	Jaundice incidence rate
Control group	50	7	6
Observation group	50	1	1
χ^2	-	4.891	3.840
P	-	0.027	0.049

4. Discussion

In recent years, an increasing number of mothers have opted for cesarean sections [7], which has, in turn, contributed to a rise in the incidence of scarred uteri. This is primarily because cesarean sections are prone to causing scarring, which can alter both the shape and structure of the uterus, ultimately resulting in a scarred uterus. During pregnancy, the gestational sac may attach to the scar, surrounded by fibrous tissue and muscle layers, potentially leading to isolated conditions. In most cases, the likelihood of successful uterine pregnancy is low [8]. After the formation of a scarred uterus, subsequent pregnancies are associated with abnormal attachment of the gestational sac, which can easily lead to significant bleeding and, in severe cases, uterine rupture, potentially resulting in maternal mortality [9]. Apart from cesarean sections, other causes of a scarred uterus include uterine anomaly correction surgeries and myomectomy. A scarred uterus significantly increases the risk of uterine rupture and may also lead to ectopic pregnancies. Research has directly pointed out that the mode of delivery in subsequent pregnancies involving a scarred uterus has a substantial impact on maternal and neonatal outcomes [10]. Therefore, selecting an appropriate delivery method is critical for ensuring favorable outcomes for both mother and child in cases of scarred uterine pregnancies.

Based on this understanding, this study explored the effects of different delivery methods on mothers and neonates in cases of scarred uterine pregnancies. A total of 100 patients admitted to Shenzhen Maternal and Child Health Hospital from July 2023 to July 2024 were included in the study. The results revealed that intrapartum blood loss, postpartum blood loss within 2 hours, and hospital stay duration were all significantly lower in the observation group ($P < 0.05$). These findings suggest that vaginal delivery can effectively reduce intrapartum and postpartum blood loss and shorten hospital stays for mothers with scarred uterine pregnancies.

In terms of neonatal Apgar scores at 1-minute post-birth, the observation group showed significantly higher scores compared to the control group ($P < 0.05$), indicating statistical significance. This suggests that vaginal delivery can effectively improve neonatal asphyxia outcomes. Additionally, the incidence rates of neonatal postpartum fever and jaundice were significantly lower in the observation group than in the control group ($P < 0.05$), indicating that vaginal delivery can reduce the occurrence of neonatal postpartum fever and jaundice.

5. Conclusion

In summary, vaginal delivery in cases of scarred uterine pregnancies can effectively reduce maternal intrapartum and postpartum blood loss, shorten hospital stays, improve neonatal asphyxia outcomes, and decrease the incidence rates of neonatal fever and jaundice. It is, therefore, a delivery method worthy of clinical promotion and application.

Disclosure statement

The authors declare no conflict of interest.

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