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Factors associated with successful vaginal birth after cesarean deliveries

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ABSTRACT

The high global cesarean section rate, ranging from 10% to 40%, imposes an economic burden at national and individual levels. Due to the increased risk of complications associated with repeated cesarean sections and the safety of vaginal birth after cesarean (VBAC), VBAC has become a preferred strategy. It is crucial to offer mothers appropriate counseling on VBAC, considering potential benefits and risks, as well as understanding other factors influencing the choice of childbirth mode. An analytical observational study with a cross-sectional design was conducted, utilizing data from medical records of patients who gave birth at Dr. Tjitrowardojo Hospital Purworejo from January 2022 to December 2022. Data from 108 subjects were analyzed using Chi-square to identify variables correlated with VBAC spontaneous delivery. Mothers who successfully delivered VBAC at a non-risk age numbered 32 (55.6%). Mothers with a parity history of ≥2 who successfully delivered VBAC numbered 47 (45.2%). Mothers who delivered babies with normal birth weight and successfully delivered via VBAC numbered 39 (41.5%). Abnormal birth weight was significantly associated with VBAC failure (PR=3.526 (1.031-12.062), p=0.036). There were 8 (72.2%) babies with an Apgar score <6 at 5 minutes after VBAC. Abnormal birth weight is associated with the failure of spontaneous VBAC delivery at Dr. Tjitrowardojo Hospital Purworejo.

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INTRODUCTION

Labor can be categorized as either physiological or pathological. Surgical intervention (cesarean section) is occasionally necessary in cases of pathological labor. Cesarean section is performed when a mother is unable to give birth naturally due to various indications, such as fetal distress,

spinopelvic disproportion, non-progressing labor, placenta previa, umbilical cord prolapses, fetal malpresentation, narrow pelvic latitude, and preeclampsia (Betran et al., 2021; Rangkuti et al., 2023).

The global cesarean section rate experienced a significant average increase from 6.7% to 19.1%, with Southeast Asia rising from 4.1% to 15%. According to the 2018 Basic Health Research in Indonesia, the occurrence rate of cesarean section deliveries was 17.6%. DKI Jakarta has the highest percentage at 31.3%, while Papua has the lowest at 6.7% (Sulistianingsih & Bantas, 2018). If this trend persists, it is projected that by 2030, the regions with the highest rates of occurrence will be Eastern Asia (63%), Latin America and the Caribbean (54%), Western Asia (50%), Northern Africa (48%), Southern Europe (47%), and Australia and New Zealand (45%) (Angolile et al., 2023; Begum et al., 2023; Boerma et al., 2018; Mia et al., 2019).

The primary factor contributing to the rising number of cesarean sections is the declining rate of vaginal birth after cesarean section (VBAC) and the accessibility of emergency obstetric care (Betrán et al., 2016; Umar & Haque, 2022). There is a growing preference for a trial of vaginal delivery for a specific group of patients with prior surgical scars due to the higher likelihood of maternal difficulties in repeat cesarean sections and the safety of VBAC. Reported rates of successful VBAC range from 60% to 80% (Biraboneye S et al., 2017; Li et al., 2019; Uno et al., 2020).

Vaginal Birth After Cesarean (VBAC) refers to the procedure of delivering a baby through the vaginal canal in women who had previously undergone a cesarean section during their prior pregnancies. Vaginal delivery is a natural and healthy process that typically involves less medical intervention and carries a lower risk to the mother's well-being. Facilitating natural childbirth involves ensuring the mother's privacy during delivery (Begum et al., 2023). The global usage of this practice is steadily rising and currently accounts for 21% of all childbirths (Betran et al., 2021; Keag et al., 2018). Patients seeking VBAC will undergo a trial of labor after cesarean (TOLAC) (Girma et al., 2021). While TOLAC is considered an acceptable and generally safe procedure, it has the risk of major complications, such as uterine rupture or dehiscence, which can harm both the mother and the newborn (Habak & Kole, 2023).

Nevertheless, the rate of VBAC has declined from a peak of 28% in 1996 to 13.3% in 2018. Patients have the option to undergo a vaginal delivery following a cesarean section, either as a planned treatment or in cases of quick delivery. If the patient falls into a group contraindicated for VBAC, a second cesarean section may be necessary (Habak & Kole, 2023; Wu et al., 2019).

The mother's decision on the delivery method is essential in providing an opportunity for a regular delivery attempt. Maternal expectations for the labor process and preferences for the delivery process are determined by various factors, including knowledge of potential advantages and disadvantages and demographic, obstetric, and social aspects. The findings of this study are anticipated to help deliver information to mothers regarding VBAC. The researcher aims to conduct a study to analyze the factors associated with successful vaginal birth after cesarean deliveries at Dr. Tjitrowardojo Hospital Purworejo from January 2022 to December 2022.

RESEARCH METHOD

The objective of this study is to analyze the factors associated with successful vaginal birth after cesarean (VBAC) deliveries at Dr. Tjitrowardojo Hospital Purworejo from January to December 2022. The research was conducted at Dr. Tjitrowardojo Hospital Purworejo during the specified period. The variables analyzed included delivery method, age category, parity, and additional maternal characteristics. The study used secondary data to extract information from patients' medical records.

The inclusion criteria for this study encompassed cases where complete medical records were available, patients who underwent successful VBAC without any medical intervention, and patients who underwent cesarean section after attempting a trial of labor after cesarean (TOLAC).

RESULTS AND DISCUSSIONS

The respondents' data were collected from January 2022 to December 2022. The researcher achieved a sample size of 108 people, including respondents who delivered a baby at Dr. Tjitrowardojo Hospital Purworejo and met the inclusion and exclusion criteria.

Table 1. Characteristics of respondents

Variable	N = 108
Age	
At risk (< 20 years atau > 35 years)	72 (66,7%)
Not at risk (20 years - 35 years)	36 (33,3%)
Parity	
P = 1	4 (3,7%)
P ≥ 2	104 (96,3%)
Birth weight	
2500 – 4000 gr	94 (87%)
< 2500 gr or > 4000 gr	14 (13%)
Apgar Score	
<6	11 (10,2%)
≥6	97 (89,8%)
Mode of delivery	
VBAC	49 (45,4%)
Re-cesarean section post TOLAC	59 (54,6%)

According to the data presented in Table 1, it was found that 72 mothers experienced high-risk conditions during childbirth. One hundred four participants (96.3%) had a history of multiple parity. Among them, 94 (87%) had babies with average birth weights, whereas 14 (13%) had babies with abnormal birth weights. The study included 49 cases of successful VBAC, accounting for 45.4% of the cases, and 59 cases of cesarean section delivery, representing 54.6% of the cases. Of the babies, 97 (89.8%) had an Apgar score greater than six during the first 5 minutes.

Table 2. Maternal and fetal factors and VBAC

Variable	VBAC (N=49)	Re-cesarean section post TOLAC (N=59)	Total (N=108)	*p*
Age				
Not at risk (20 years - 35 years)	32 (55,6%)	40 (44,4%)	72 (66,7%)	0.785
At risk (< 20 years atau > 35 years)	17 (47,2%)	19 (52,8%)	36 (33,3%)	
Parity				
P = 1	2 (50%)	2 (50%)	4 (3,7%)	0,850
P ≥ 2	47 (45,2%)	57 (54,8%)	104 (96,3%)	
Birth weight				
2500 – 4000 gr	39 (41,5%)	55 (58,5%)	94 (87%)	0,036
< 2500 gr or > 4000 gr	4 (28,6%)	10 (71,4%)	14 (13%)	
Apgar Score				
< 6	8 (72,7%)	3 (27,3%)	11 (10,2%)	0,054
> 6	41 (42,3%)	56 (57,7%)	97 (89,8%)	

Table 2 demonstrates a statistically significant association between birth weight parameters and successful VBAC, with a p-value of 0.036. Conversely, maternal age and parity showed no significant association with successful VBAC, as indicated by p-values exceeding 0.05. Among mothers at risk age who successfully delivered VBAC, 44.4% achieved this, while mothers with a history of two or more children who successfully delivered VBAC constituted 45.2% of cases. Furthermore, 41.5% of mothers successfully delivered average birth weight babies through VBAC. The percentage of babies born by VBAC with an Apgar score of less than 6 in the first 5 minutes was 72.2%, compared to 27.3% for those born by cesarean section.

Table 2 shows that 32 mothers (55.6%) successfully gave birth to VBAC at a non-risk age, whereas only 17 mothers (44.4%) successfully gave birth to VBAC at a risk age. Individuals below the age of 20 or above 35 are considered risk factors due to the decline in organ function, especially in reproductive organs, commonly associated with advancing age. Those under the age of 20 may have reproductive organs that are not fully developed, potentially increasing the likelihood of encountering challenges during pregnancy and childbirth. Additionally, during both early and late stages of life, the perineal and abdominal muscles may not function at their optimal efficiency, potentially resulting in prolonged or obstructed labor, necessitating medical intervention.

The study discovered that multiparous mothers (47, 45.2%) were more likely to successfully deliver through VBAC compared to primiparous mothers (2, 50%). This finding aligns with Obeidat's research, emphasizing a decrease in complications with subsequent births, especially in parity 2-3.

The study discovered that multiparous mothers (47, 45.2%) were more likely to successfully deliver through VBAC compared to primiparous mothers (2, 50%). Mothers with previous birthing experience (multipara) were more likely to achieve a successful VBAC. Obeidat's 2013 research suggests that first-time mothers generally face a higher risk of complications for both themselves and their babies. However, this risk tends to decrease with subsequent births, only to increase again with each subsequent pregnancy, particularly from the fourth (Obeidat et al., 2013). Parity 2-3 is considered the most secure in terms of maternal death rates, as both parity one and parity greater than three are associated with higher rates.

Women with a history of successful VBAC were 9.46 times more likely to have another successful VBAC (Girma et al., 2021; Misgan et al., 2020; Siraneh et al., 2018), highlighting the psychological preparedness and knowledge gained from prior experiences regarding the benefits of delivering vaginally (Alani et al., 2017; Bayou et al., 2016). Prior VBAC suggests that the reasons for the initial cesarean section are less likely to recur, providing valuable information to healthcare professionals and assisting them in refraining from making premature decisions regarding the method of delivery (Tesfahun et al., 2023). Nevertheless, a 2019 study conducted by Jumaah revealed a noteworthy correlation between a higher number of previous vaginal births (multiparity) and successful attempts at VBAC in patients (Jumaah et al., 2019).

Regarding birth weight, 41.5% of mothers with babies of average birth weight successfully delivered through VBAC, while only 28.6% with abnormal LBW achieved successful VBAC deliveries. Women with a significant birth weight baby were more prone to experiencing a failed vaginal birth after cesarean (VBAC). Specifically, women who gave birth to a macrosomic baby weighing 3.65 kg or more were at a greater risk of VBAC failure (Maroyi et al., 2021). This study aligns with Girma's research, which indicates a decline in the rate of successful vaginal delivery among patients with birth weights over 4000 grams and falling below 2500 grams (Girma et al., 2021).

In comparing the Apgar scores of newborns, it was observed that children born through VBAC (Vaginal Birth After Cesarean) had Apgar scores less than 6 in the first 5 minutes in 72.2% of cases, while among children born by cesarean section, the corresponding number was 27.3%. This finding contrasts with Bhardwaj et al., (2023) study, where all newborns had Apgar ratings greater than six at 5 minutes after VBAC and 81.67% of babies had Apgar scores greater than six after an

elective cesarean procedure. The observed difference in Apgar scores was statistically significant, with a p-value of 0.009. Furthermore, the rate of live births following cesarean section was 93.33%, compared to 100% after VBAC.

Obsa-et al.'s study found that approximately 30.2% of newborn babies had an Apgar score below seven, while about 69.8% had a high Apgar score at one minute. Conversely, about 12.8% of babies exhibited a low Apgar score at five minutes, while approximately 91.2% displayed a high Apgar score, indicating an improvement in Apgar scores over time. In general, there was a decrease of almost 50% in the number of newborns with a poor Apgar score at one minute compared to the Apgar score at five minutes (Obsa et al., 2020).

CONCLUSION

The results of the study revealed no significant correlation between maternal gestational age, parity history, Apgar score, and the successful spontaneous VBAC delivery at Dr. Tjitrowardojo Hospital Purworejo from January to December 2022. However, a notable correlation was identified between the variable of an infant's birth weight and the likelihood of a successful spontaneous VBAC birth. The interpretation of medical record data in this study is constrained by inadequate information within the records. The lack of comprehensive data resulted in a significant loss of analyzable information for the researchers. The study expresses hope for a future commitment to enhancing patient care, aiming for complete and detailed data within medical records. This study offers direct insights to the community, especially pregnant women, in acquiring knowledge that can be influenced by information from many sources. This study implies that hospitals should prioritize emphasizing characteristics that increase the chances of a successful vaginal birth during counseling and the selection of women for a trial of labor following cesarean surgery. Additionally, it suggests the need for hospitals to develop a decision tool that considers previous and current obstetric problems, along with other predictive factors, to ensure the success of VBAC.

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