**Bangabandhu Sheikh Mujib Medical University Journal** 2025;19(1):e82199
ISSN 2074-2908 | eISSN 2224-7750 |

RESEARCH ARTICLE

# Outcome of trial of labour for vaginal birth after one caesarean section

Reefaat Rahman[1] | Begum Nasrin[1] | Tarafder Runa Laila[1] |
Farzana Aktar[2] | Nurun Nahar Khanam[1]

[1]Department of Obstetrics and Gynaecology, Bangladesh Medical University, Dhaka, Bangladesh
[2]Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Dhaka, Bangladesh

## Abstract

**Background:** Vaginal birth after cesarean section (VBAC) is a vital option for women with a prior cesarean section (C/S), but its success depends on some maternal factors, obstetric history, and labor conditions. This study aimed to find out the potential risks and benefits of VBAC.

**Methods:** This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU) (currently, Bangladesh Medical University), Dhaka, Bangladesh, from January 2023 to December 2024. This study included 162 pregnant women with a history of one C/S attending the Obstetrics and Gynaecology department of BSMMU.

**Results:** Most of the participants (75.3%) were between 21–30 years old. Among the women who attempted TOLAC, 33.3% successfully had a VBAC, while 66.7% required an emergency repeat cesarean section. Fetal distress (51.3%) was the most common reason for the previous cesarean and the main cause of emergency repeat cesarean section after failed trial, which is 48.2%. Babies born through VBAC had satisfactory neonatal outcomes, with 90.7% having a good Apgar score (>7) compared to 75.9% in the emergency repeat caesarean section (ERCS) group.

**Conclusion:** This study found that fetal distress is a major factor leading to ERCS and underscores the better neonatal outcomes and lower postpartum hemorrhage rates in VBAC deliveries.

**Correspondence**
Reefaat Rahman
reefaatrahman@bmu.ac.bd

**Publication history**
Received: 13 June 2025
Accepted: 17 Nov 2025
Published online: 7 Jan 2026

**Responsible editor**
M Mostafa Zaman
0000-0002-1736-1342

**Reviewer**
H: Kohinoor Begum
0009-0007-6314-7834

**Keywords**
*VBAC, TOLAC, caesarean section, outcome*

**Funding**
Funded by Bangabandhu Sheikh Mujib Medical University (currently, Bangladesh Medical University) Dhaka, Bangladesh, Ref No: BSMMU/2023/954(3), Dated 25 Jan 2023

**Ethical approval**
Approved by IRB of Bangladesh Medical University (Ref No: BSMMU/2022/7374, Dated 31 July 2022)

**Trial registration number**
Not applicable

## Key messages

This study shows that Vaginal birth after cesarean section (VBAC) is a safe and effective option for appropriately selected women, with favourable maternal and neonatal outcomes. Implementing standardized counselling, strict eligibility criteria and continuous intrapartum monitoring can significantly increase VBAC success rates. Strengthening VBAC practices may help reduce unnecessary repeat caesarean sections and improve overall obstetric care quality in our setting.

## Introduction

Vaginal birth after cesarean section (VBAC), the term that describes a vaginal delivery in a woman who has given birth via cesarean section in a previous pregnancy. Patients desiring VBAC delivery need to undergo a trial of labor, popularly known as a trial of labor after cesarean section (TOLAC). Delivery by cesarean section has increased significantly worldwide. In the United States, this rate increased from 5% in 1970 to 32.9% in 2009 and 31.9% in 2016 [1]. Several efforts failed to achieve the 15% cesarean delivery rate recommended by WHO [2].

The principal contributing factor to the overall increased cesarean section (CS) rates is repeat CS [3] Historically, the dictum "once a cesarean, always a cesarean" was introduced by Cragin in 1916, during the era of classical cesarean sections [4]. With the advent of lower-segment cesarean sections (LSCS), the safety of cesarean delivery has improved significantly. Modern practice now emphasises institutional delivery with proper monitoring and emergency support rather than routine repeat cesarean [5]. Vaginal delivery following cesarean surgery is a generally safe method compared to repeat CS, according to several studies [6], with the increasing rate of primary cesarean deliveries, more women are facing the prospect of repeat surgeries. A trial of labor after vaginal delivery can minimise the risk of repeated cesarean sections for women.

Patients with a previous cesarean have two options: planned repeat cesarean delivery (PRCD) or TOLAC, which may lead to either successful VBAC or unplanned cesarean. While successful VBAC reduces surgical risks, failed TOLAC can increase complications for both mother and baby more than an elective repeat CS [7]. The solution to this concern would be a careful selection of the patient for VBAC [8].

There are no official national VBAC statistics for Bangladesh. Instead, available data comes from specific hospital-based studies. Studies in various Bangladeshi hospitals report different success rates among selected, eligible patients attempting a trial of labor (TOLAC). One 2023 study in a private hospital found a success rate of 69.3% among cases enrolled in a trial of labor [9]. Another study done in a private hospital found a success rate of 64.8% among the patients who underwent a trial of labor [10].

In addition, with rising global cesarean section rates, promoting safe and successful VBAC can help reduce maternal morbidity, improve recovery times, and lower healthcare costs. However, the decision to pursue TOLAC is complex and influenced by multiple factors, including maternal characteristics, obstetric history, and hospital resources. Therefore, this study aimed to find out the potential risks and benefits of vaginal birth after cesarean section and to analyse the factors that influence the outcomes.

## Methods

This study was conducted in the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (currently, Bangladesh Medical University) Dhaka, Bangladesh, from January 2023 to December 2024. This study included 162 pregnant women with a history of one cesarean section (C/S) between 37 weeks and 41 weeks of gestation who attended the inpatient and outpatient departments of Obstetrics and Gynaecology at Bangabandhu Sheikh Mujib Medical University (currently, Bangladesh Medical University) Dhaka, Bangladesh for obstetric management during the study period.

Initially, 192 women were included in the study at the beginning of their third trimester following the inclusion and exclusion criteria; among them, 30 patients were excluded near term due to various medical and obstetrical complications.

These are the following criteria to be eligible for enrollment as our study participants: a) Patients aged between 20 to 45 years; b) Patients with term pregnancy between 37 weeks to 41 weeks of gestation; c) Patients with a history of previous cesarean section; d) Patients who were willing to participate were included in the study and a) Patients with comorbidities like DM (FBS above 5.3mmol/L or 2HA 75 mg glucose above 8.5 mmol/L), morbid obesity (pre pregnancy BMI above 40) and hypertensive disorder ( blood pressure above 140/90 on at least two occasions 4 hours apart) b) Patients with fetal macrosomia and abnormal presentation like breech, face, transverse lie, *etc.*; c) Patients with cephalopelvic disproportion (CPD), dystocia or failure to progress of labor and failed induction; d) Patients with standard contraindications to labor or vaginal birth (*e.g.,* placenta previa, CPD, previous successful repair of VVF, *etc.*); e) Patients with a high risk of intrapartum uterine rupture were excluded from our study.

All patients of this study had a spontaneous onset of labour; induction was not given to any patient. The labour process was observed meticulously, following the standard labour care guide. The labour monitoring was done mainly by the resident doctors with the presence of a consultant gynaecologist. Most of the deliveries were spontaneous vaginal deliveries, only two required vacuum extraction. Fetal wellbeing was monitored using Doppler and intermittent CTG. Fetal distress was identified by CTG. Provision for emergency caesarean section was kept ready in case of any impending rupture .

### Statistical analysis

All data were systematically recorded using a preformatted data collection form. Quantitative variables were presented as mean (standard deviation), while qualitative data were shown as frequencies and percentages. The chi-square test was used to assess fetal outcomes in vaginal deliveries and the repeat cesarean group. Analyses were performed using SPSS version 26 for Windows. Ethical approval was obtained from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (currently, Bangladesh Medical University) Dhaka, Bangladesh. The procedure with benefits and risks were explained. All the patients participated voluntarily and informed written consent were taken. There was no conflict of interest. Honesty, accuracy, and freedom from bias were ensured.

**Table 1 Demographic and obstetric characteristics of study participants (n=162)**

| Characteristics | Number (%) |
|---|---|
| Maternal age, years | |
| 21–30 years | 122 (75.3) |
| 31–40 years | 28 (17.3) |
| >40 years | 12 (7.4) |
| Mean (Standard deviation) | 28.7 (4.8) |
| Body mass index, kg/m² | |
| 18.5–25 | 81 (50.0) |
| 26–30 | 73 (45.6) |
| >30 | 8 (4.9) |
| Mean (Standard deviation) | 25.1 (3.4) |
| History of vaginal delivery | 32 (19.8) |
| Type of delivery | |
| Vaginal birth after cesarean | 54 (33.3) |
| Emergency repeat cesarean section | 108 (66.7) |

## Results

Table 1 shows that the majority of women (75.3%) were between 21–30 years of age, followed by 17.3% in the 31–40 age group, and only 7.41% were over 40. Regarding BMI, half of the participants (50%) had a normal BMI (18.5–25 kg/m²), 45.06% were overweight (BMI 26–30 kg/m²), and 4.9% were obese (BMI >30). A history of previous vaginal delivery was noted in 19.8% of women. Among those who underwent a trial of labor, 33.3% achieved a successful vaginal birth after cesarean (VBAC), while 66.7% required an emergency repeat cesarean section.

**Table 2 Indications of caesarean sections**

| Characteristics | Number (%) |
|---|---|
| First ever cesarean section | |
| Fetal distress | 83 (51.2) |
| Post maturity | 32 (19.8) |
| Breech presentation | 13 (8.0) |
| Transverse lie | 7 (4.3) |
| Prolonged labor | 8 (4.9) |
| Antepartum hemorrhage | 5 (3.1) |
| Elective caesarean sections (by maternal request) | 14 (8.6) |
| Repeat cesarean section | |
| Fetal distress | 52 (48.2) |
| Scar tenderness | 21 (19.4) |
| Prolonged/failed progress of labor | 19 (17.6) |
| Maternal exhaustion / own request | 16 (14.8) |

As given in Table 2, the most common indication for the initial cesarean section was fetal distress (51.2%), followed by post-maturity (19.8%), breech presentation (8.0%), and transverse lie (4.3%). In emergency repeat cesarean sections, fetal distress remained the leading cause (48.2%), followed by scar tenderness (19.4%), prolonged labor (17.59%), and maternal exhaustion or personal preference (14.8%).

Table 3 shows that in the VBAC group (n=54), fetal distress was observed in only 3 cases (5.6%), indicating a significantly lower incidence compared to the ERCS group (n=108), where 52 cases (48.2%) experienced fetal distress ($P$<0.001). The fetal weight range was comparable between the two groups, with VBAC neonates weighing between 2.4–3.5 kg and ERCS neonates ranging from 2.5–3.4 kg. Assessment of Apgar scores showed that a good Apgar score (>7) was more frequently observed in the VBAC group, with 49 neonates (90.7%) scoring in the normal range, whereas only 82 neonates (75.9%) in the ERCS group had similarly favorable scores ($P$=0.024). Conversely, average Apgar scores (<7) were recorded in 5 neonates (9.7%) in the VBAC group and 26 neonates (24.1%) in the ERCS group ($P$=0.024).

## Discussion

This study explored the outcome of a trial of labour after one previous caesarean section in a tertiary care hospital. It particularly focused on the clinical results and the practical realities that influence decision-making by both clinicians and patients. The findings provide a realistic view of current VBAC practice in Bangladesh, where the success of TOLAC is shaped not only by obstetric factors but also by physicians' attitudes, patient preferences, and the readiness of the health system.

In this study, the success rate of VBAC was 33.3%, which is lower than the success rates reported in most international studies, usually ranging from 60% to 80.0% [11]. This difference probably reflects the cautious approach commonly taken in our setting, where both clinicians and patients tend to prefer a planned repeat caesarean section due to fear of complications. Limited availability of continuous fetal monitoring also contributes to this conservative tendency. The novelty of this study lies in identifying these local barriers, highlighting that institutional and cultural contexts are as important as medical indications when considering VBAC.

The mindset of the clinician plays a central role in the outcome of TOLAC. Many obstetricians, even in tertiary hospitals, are hesitant to allow labour after caesarean because of the perceived risk of uterine rupture and the potential medicolegal consequences if complications occur. Similar findings were reported [12, 13], who observed that clinician confidence and institutional policies strongly influence the decision to offer TOLAC. In our experience, many repeat caesarean deliveries are performed pre-emptively, even in women with favorable conditions, because of this underlying fear. However, our findings show that with proper case selection and close monitoring, VBAC can be achieved safely, with good neonatal outcomes and minimal maternal morbidity.

Patients' attitudes and expectations also have a major influence on the mode of delivery. In urban areas, women often consider caesarean section a more predictable and comfortable option, while others express a strong desire for normal delivery because of

**Table 3 Neonatal outcomes among study participants (n=162)**

| Parameters | VBAC[a] (n=54) | ERCS[a] (n=108) | *P* |
|---|---|---|---|
| Fetal distress | | | |
| n (%) | 3 (5.6) | 52 (48.2) | <0.001 |
| Fetal weight (kg) | | | |
| Range | 2.4 – 3.5 | 2.5 – 3.4 | 0.27 |
| Mean (SD)[a] | 3.0 (0.3) | 3.0 (28.0) | |
| Apgar score at 5 min | | | |
| Good (>7) | 49 (90.7) | 82 (75.9) | 0.02 |
| Average (<7) | 5 (9.3) | 26 (24.1) | 0.02 |
| Mean (SD)[a] | 8.4 (0.6) | 8.0 (0.7) | |

[a]VBAC indicates vaginal birth after cesarean section; ERCS, emergency repeat caesarean section; SD, standard deviation

faster recovery and lower cost. The decision is therefore a balance between convenience and risk perception. Proper counselling plays a vital role here. As highlighted in previous studies [14], shared decision-making that clearly explains both the benefits and risks of TOLAC can increase the rate of successful VBAC while maintaining patient safety. In our setting, patient education remains limited, and many women decide based on anecdotal experience rather than medical advice.

Health system preparedness is another crucial determinant of success. Safe TOLAC requires continuous intrapartum monitoring, prompt access to emergency theatre, and the presence of skilled personnel. In many hospitals in developing countries, these facilities are not always consistently available, which understandably makes obstetricians reluctant to take the risk of allowing labour to continue after a previous caesarean. Strengthening hospital infrastructure, ensuring the presence of experienced obstetric and anaesthetic teams, and introducing standard operating protocols for VBAC could greatly improve outcomes.

Our results reaffirm that VBAC is not only a clinical choice but also a reflection of trust—between patient and clinician—and the capability of the health system. Consistent with previous findings, favorable predictors such as previous vaginal delivery and optimal fetal weight were associated with better outcomes. Yet, the broader implication of this study is the need to change our professional mindset and institutional culture from the old dictum of "once a caesarean, always a caesarean" to an evidence-based, patient-centred approach. Encouraging safe VBAC practices, supported by structured counselling and institutional preparedness, may help reduce unnecessary repeat caesarean sections and improve maternal and neonatal health in the long term.

### Limitations

This study has several limitations. First, it was conducted in a single tertiary hospital with a relatively small sample size. Therefore, the findings may not be generalizable to other healthcare settings, particularly private or rural institutions with different patient characteristics and resource availability.

Second, only women who were willing to undergo a trial of labour were included, while those opting for elective repeat caesarean section were excluded. This introduces potential selection bias, which may have influenced the observed VBAC success rate.

Third, continuous electronic fetal monitoring and 24–hour anaesthetic or surgical support were not always available. These limitations might have prompted earlier decisions for repeat caesarean section in cases where close observation could have resulted in a successful VBAC.

Fourth, this study focused on immediate maternal and neonatal outcomes. Long-term follow-up of subsequent pregnancies or uterine scar integrity was not undertaken, which limits the understanding of extended maternal health outcomes.

Finally, labour progress and clinical decisions were made by different obstetricians on duty, which may have led to observer variation in case management.

Despite these limitations, this study provides valuable local evidence on VBAC practice in Bangladesh and highlights the importance of institutional preparedness, clinician confidence, and patient counselling in improving outcomes for women with a previous caesarean section.

### Conclusion

This study found that VBAC can be a safe and feasible option for many women, especially those with a history of vaginal delivery and favorable obstetric factors. However, failed TOLAC carries significant risks, including increased maternal morbidity. Predictive factors such as prior vaginal delivery, Bishop score, fetal weight, and maternal age should be considered when counseling women about TOLAC. Further research, particularly RCTs, is essential to refine selection criteria and improve VBAC success rates, ultimately reducing unnecessary repeat cesarean sections. Further prospective, longitudinal studies with larger sample sizes are required to improve VBAC success rates and minimise unnecessary repeat cesarean deliveries.

### Acknowledgments

We were grateful to the staff of the Department of Obstetrics and Gynaecology and the University Research Board of Bangabandhu Sheikh Mujib Medical University (currently, Bangladesh Medical University) Dhaka, Bangladesh.

### Author contributions

*Concept or design of the work; or the acquisition, analysis, or interpretation of data for the work:* RR, NNK, BN, TRL, FA. *Drafting the work or reviewing it critically for important intellectual content:* RR, NNK, BN, TRL, FA. *Final approval of the version to be published:* RR, NNK, BN, TRL, FA. *Accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved:* RR, NNK, BN, TRL, FA.

### Conflict of interest

We do not have any conflict of interest.

### Data availability statement

We confirm that the data supporting the findings of the study will be shared upon reasonable request.

### AI disclosure

None

### Supplementary file

None

## References

1. Martin JA, Hamilton BE, Osterman MJK. Births in the United States, 2016. NCHS Data Brief. 2017 Sep;(287):1-8. PMID: 29155684
2. World Health Organization Human Reproduction Programme, 10 April 2015. WHO Statement on caesarean section rates. Reprod Health Matters. 2015 May;23(45):149-150. doi: https://doi.org/10.1016/j.rhm.2015.07.007
3. Cheng YW, Eden KB, Marshall N, Pereira L, Caughey AB, Guise JM. Delivery after prior cesarean: maternal morbidity and mortality. Clin Perinatol. 2011 Jun;38(2):297-309. doi: https://doi.org/10.1016/j.clp.2011.03.012

4. Porreco RP. Meeting the challenge of the rising cesarean birth rate. Obstet Gynecol. 1990 Jan;75(1):133-136 PMID: 2296410
5. Pridjian G, Hibbard JU, Moawad AH. Cesarean: changing the trends. Obstet Gynecol. 1991 Feb;77(2):195-200. doi: https://doi.org/10.1097/00006250-199102000-00006
6. Wu Y, Kataria Y, Wang Z, Ming WK, Ellervik C. Factors associated with successful vaginal birth after a cesarean section: A systematic review and meta-analysis. BMC Pregnancy Childbirth. 2019 Oct 17;19(1):360. doi: https://doi.org/10.1186/s12884-019-2517-y
7. Zeteroglu S, Ustun Y, Engin-Ustun Y, Sahin HG, Kamaci M. Eight years' experience of uterine rupture cases. J Obstet Gynaecol. 2005 Jul;25(5):458-461. doi: https://doi.org/10.1080/01443610500160238
8. Eden KB, McDonagh M, Denman MA, Marshall N, Emeis C, Fu R, Janik R, Walker M, Guise JM. New insights on vaginal birth after cesarean: can it be predicted? Obstet Gynecol. 2010 Oct;116(4):967-981. doi: https://doi.org/10.1097/AOG.0b013e3181f2de49
9. Ara A, Khan S, Akter S, Samsunnahar BS, Akter E, Begum F. Factors associated with successful vaginal birth after a caesarean section: A cross sectional study at Institute of Woman and Child Health, Bangladesh. Bangladesh Journal of Obstetrics and Gynaecology:38(2);64-70. doi: https://doi.org/10.3329/bjog.v38i2.82095
10. Akter M, M F, J S, Rrb, RRBR. Experience of VBAC in a private hospital. Bangladesh Journal of Obstetrics & Gynaecology. 2023 Sep 27; 37(1): 28–31. doi: https://doi.org/10.3329/bjog.v37i1.68629
11. Guise JM, Hashima J, Osterweil P. Evidence-based vaginal birth after Caesarean section. Best Pract Res Clin Obstet Gynaecol. 2005 Feb;19(1):117-130. doi: https://doi.org/10.1016/j.bpobgyn.2004.10.015
12. Landon MB, Leindecker S, Spong CY, Hauth JC, Bloom S, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ, Sorokin Y, Miodovnik M, Carpenter M, Peaceman AM, O'Sullivan MJ, Sibai BM, Langer O, Thorp JM, Ramin SM, Mercer BM, Gabbe SG; National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. The MFMU Cesarean Registry: Factors affecting the success of trial of labor after previous cesarean delivery. Am J Obstet Gynecol. 2005 Sep;193(3 Pt 2):1016-1023. doi: https://doi.org/10.1016/j.ajog.2005.05.066
13. Haumonté JB, Raylet M, Sabiani L, Franké O, Bretelle F, Boubli L, d'Ercole C. Quels facteurs influencent la voie d'accouchement en cas de tentative de voie basse sur utérus cicatriciel ? [Predictive factors for vaginal birth after cesarean section]. J Gynecol Obstet Biol Reprod (Paris). 2012 Dec;41(8):735-752. French. doi: https://doi.org/10.1016/j.jgyn.2012.09.032
14. Gonen R, Tamir A, Degani S, Ohel G. Variables associated with successful vaginal birth after one cesarean section: a proposed vaginal birth after cesarean section score. Am J Perinatol. 2004 Nov;21(8):447-453. doi: https://doi.org/10.1055/s-2004-835961