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Success Rate and Factors Associated With Trial of Labour After One Caesarean Section at Al Thawra Hospital in Ibb City, Yemen: A Retrospective Cohort Study

Ansia Al Sarmi
Ibb University
Abdulrakeeb Shomais
Ibb University
Ghaida Al-Falahi
Ibb University
Zainab Abdulhafiz
Ibb University
Rofaida AlGumaei
Ibb University
Balqees Alhammadi
Ibb University
Khawla Abdusamie
Ibb University
Marya Albukhaiti
Ibb University
Najwa Saleh
Ibb University
Rana Alalawy
Ibb University
Sara Obadi
Ibb University
Taiseer Altam
Ibb University
Zahra Alhendi
Ibb University
Wadee Abdullah Al-Shehari
Dr.wadee40@yahoo.com

Ibb University

Wadhah Hassan Edrees
Hajjah University

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Abstract

Background

Trial of labour after caesarean (TOLAC) is a key strategy to curb rising caesarean delivery rates; however, its success determinants in resource-constrained settings remain inadequately characterised.

Objective

To identify factors associated with successful TOLAC among women with one previous caesarean section at Al Thawra Hospital, Ibb City, Yemen.

Methods

A retrospective cohort study was conducted among pregnant women with a single prior caesarean delivery. Data were extracted from medical records, using SPSS version 27.0.

Results

Among 180 women, 86 (47.8%) achieved VBAC and 94 (52.2%) failed. On univariate analysis, chronic diseases (9.6% vs. 2.3%; *P* = 0.04), gravidity < 4 (71.3% vs. 53.5%; *P* = 0.014), and parity < 4 (84.0% vs. 72.1%; *P* = 0.05) were associated with failure, whereas induction of labour (20.9% vs. 5.3%; *P* = 0.002), prior VBAC (11.6% vs. 2.1%; *P* = 0.01), episiotomy (27.9% vs. 3.2%; *P* < 0.001), and abnormal birth weight (19.8% vs. 8.5%; *P* = 0.029) were associated with success. Multivariable analysis confirmed chronic disease as a strong negative predictor (aOR = 0.099; 95% CI: 0.017–0.559; *P* = 0.009), while induction of labour (aOR = 13.629; 95% CI: 3.511–52.900; *P* < 0.001), episiotomy (aOR = 19.248; 95% CI: 4.811–77.008; *P* < 0.001), gestational age determination by last menstrual period (aOR = 3.650; 95% CI: 1.416–9.409; *P* = 0.007), and abnormal birth weight (aOR = 4.259; 95% CI: 1.324–13.703; *P* = 0.015) remained positive predictors.

Conclusions

TOLAC success is significantly influenced by chronic diseases, induction of labour, episiotomy, and birth weight. These findings underscore the urgent need for individualised counselling and standardised protocols to optimise TOLAC outcomes in similar low-resource settings.

Introduction

Trial of labour after caesarean (TOLAC) has emerged as a pivotal strategy to mitigate the global epidemic of repeat caesarean deliveries, offering women with a previous uterine scar the opportunity for vaginal birth after caesarean (VBAC). Over the past three decades, the worldwide caesarean section rate has nearly doubled, rising from approximately 12.1% in 2000 to 21.1% in 2023, with some regions exceeding 40% [1–3]. This escalation carries profound implications for maternal and neonatal health, as repeat caesarean deliveries are independently associated with increased risks of placenta accreta spectrum, uterine rupture, surgical morbidity, and higher healthcare expenditures compared to vaginal delivery [4–5].

The advantages of successful VBAC are well established and include reduced maternal morbidity, expedited recovery, shorter hospitalisation, fewer surgical complications, lower rates of postpartum haemorrhage and infection, and diminished healthcare costs [4, 6–7]. Moreover, VBAC is associated with a lower incidence of thromboembolic events, reduced transfusion requirements, and decreased maternal mortality relative to elective repeat caesarean delivery [8–9]. Psychologically, women who achieve VBAC report greater birth satisfaction and a higher likelihood of subsequent vaginal deliveries [10].

Nevertheless, TOLAC success rates exhibit considerable geographical heterogeneity, shaped by maternal, fetal, obstetric, and health-system determinants. A meta-analysis of 51 studies (2010–2023) yielded a pooled success rate of 67.5%, with a wide range (41.3%–91.3%) [11–12]. High-income countries display marked variability: Sweden has reported success rates exceeding 90% [10, 13], whereas the United States has TOLAC attempt rates as low as 15% and a success rate of ~ 52% among those who attempt [11, 14]. Canada and the United Kingdom report attempt rates of 28% and 19%, respectively [15–16]. In Asia, success rates range from 84.5% in China [17] and 82.3% in India [18–19] to 75–91% in Iran [20–21]. Notably, in African settings—which share resource constraints with Yemen—rates vary between 41.3% and 66.1% [22–23], underscoring the necessity of context-specific research.

Numerous predictive factors have been scrutinised to guide clinical decision-making. Prior vaginal delivery, particularly a history of successful VBAC, consistently emerges as the strongest predictor, with adjusted odds ratios ranging from 5.17 to 9.94 [24–25]. Maternal obesity (BMI ≥ 30 kg/m²) reduces success odds by 40–60%, while spontaneous labour onset, non-recurrent indications for the previous caesarean, estimated fetal weight < 4000 g, absence of comorbidities, and favourable cervical status at admission are favourable prognosticators [9, 26–27]. Conversely, hypertensive disorders, advanced maternal age (> 35 years), previous caesarean for dystocia, inter-delivery interval < 24 months, and prostaglandin-induced labour are consistently associated with failure [5, 28, 29].

The Republic of Yemen, a low-income nation on the Arabian Peninsula, has been engulfed in armed conflict since 2015, precipitating a severe humanitarian crisis and the near-collapse of its healthcare infrastructure [30]. The health system suffers from critical shortages of trained personnel, medical supplies, and essential obstetric services. According to the United Nations Population Fund [31], Yemen's maternal mortality ratio is 183 per 100,000 live births, and caesarean rates in certain governorates range from 15% to 38%. The Yemen Demographic and Health Survey (2015–2016)

indicated that only 42% of women deliver in a health facility, with skilled attendance at birth at a similarly low 42% [32]. These structural deficiencies profoundly affect obstetric outcomes and the feasibility of TOLAC programmes.

To date, no published study has systematically evaluated TOLAC success rates or predictors in Yemen. Given the country's unique challenges—including limited intrapartum monitoring, a dearth of experienced obstetricians, and inherently conservative clinical practices—international prediction models may lack external validity in this context. Elucidating locally relevant predictors is therefore essential for evidence-based counselling, tailored obstetric care, and the safe implementation of VBAC initiatives.

Women who experience failed TOLAC incur the highest morbidity, with heightened risks of uterine rupture, emergency hysterectomy, and neonatal compromise [5, 33]. The central clinical dilemmas are accurate prediction of VBAC success and individualised risk stratification. Although several validated models exist, their applicability to Yemeni women remains untested. This knowledge gap impedes the development of context-appropriate guidelines. Accordingly, this study was designed to evaluate the success rate of TOLAC after one caesarean section and to identify the maternal, obstetric, and intrapartum factors associated with successful VBAC at Al Thawra Hospital in Ibb City, Yemen.

Methods

Study Design and Setting

This retrospective cohort study included consecutive singleton pregnancies with a single previous caesarean section planned for TOLAC at Al Thawra General Hospital, a tertiary referral centre in Ibb City (approximately 200 km southeast of Sana'a). The hospital serves as the primary obstetric and gynaecological referral facility for Ibb city, which has an estimated population of 1.9 million [34]. It provides comprehensive maternity services, including antenatal care, intrapartum management, operative obstetrics, and neonatal care. Data were collected retrospectively between JJanuary 1 to December 30, 2025 AD, ensuring a sufficient timeframe to accrue an adequate sample.

Study Population and Selection Criteria

The source population comprised all women with a history of one prior caesarean delivery who underwent TOLAC at Al Thawra Hospital during the study period. Based on medical records, participants were classified into two groups: successful TOLAC (VBAC) and failed TOLAC (repeat caesarean).

Inclusion criteria were: (1) singleton pregnancy; (2) documented indication for pregnancy termination (spontaneous labour, premature rupture of membranes [PROM], pre-eclampsia, or other obstetric indications); (3) low-transverse uterine incision from the previous caesarean; (4) no history of other uterine surgeries (e.g., myomectomy, perforation); (5) absence of obstetric contraindications to vaginal delivery; (6) exactly one previous caesarean section; and (7) complete delivery documentation. **Exclusion**

criteria were: (1) pregnancy ending before 37 weeks of gestation or non-viable; (2) incomplete medical records (n = 26); (3) estimated fetal weight ≥ 4500 g (macrosomia) on ultrasound; (4) more than one previous caesarean; (5) incomplete delivery records; and (6) uterine rupture diagnosed before or during TOLAC.

Sample Size

A total of 206 women were initially identified; after applying the eligibility criteria, 180 (87.4%) were retained for final analysis.

Data Collection Tool

Tool development

A structured observation checklist was devised by the research team to systematically extract relevant variables from hospital records. The instrument was informed by a comprehensive literature review of TOLAC prognostic studies [7, 9, 33] and adapted to the data available in Al Thawra Hospital patient files. The checklist was piloted on 10 medical records and refined for clarity and completeness prior to full-scale data extraction.

Tool content: The checklist captured three domains: **Maternal sociodemographic and clinical characteristics**: age (< 20 years, 20–34 years, or ≥ 35 years; subsequently dichotomised to < 20 vs. ≥20 years due to sparse cells), presence of chronic diseases (hypertension, diabetes, renal disease, etc.), and body mass index (BMI) at booking (excluded because of incomplete documentation). **Obstetric history**: gravidity (< 4 vs. ≥4), parity (< 4 vs. ≥4), time interval from the last caesarean (≤ 2 vs. ≥3 years), prior vaginal delivery (yes/no), prior VBAC (yes/no), and documented history of uterine rupture. Current pregnancy and delivery characteristics: induction of labour (yes/no)—defined as pharmacological (oxytocin, prostaglandins) or mechanical (Foley catheter) initiation; gestational age at delivery (< 37 vs. ≥37 weeks); method of gestational age determination (last menstrual period [LMP] vs. early ultrasound < 20 weeks, with a third “unknown” category); episiotomy performance (yes/no); birth weight (normal: 2500–3999 g; abnormal: <2500 g or ≥ 4000 g); Apgar scores at 1 and 5 minutes (captured but excluded from analysis due to high missingness); and indications for both the previous and current (repeat) caesarean sections (categories as per standard obstetric nomenclature).

Data were extracted by four trained medical students (R.A., B.A., K.A., M.A.) under the supervision of the principal investigator and senior supervisor. Each form was cross-checked for completeness and accuracy; discrepancies were resolved by re-reviewing the original records.

Data Analysis

Data were entered into Microsoft Excel and verified for accuracy. Statistical analysis was performed using SPSS version 27.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarised as frequencies and percentages; continuous variables were expressed as means (standard deviations) or medians (interquartile ranges), as appropriate. **Bivariate analysis**: Associations between each independent variable and TOLAC outcome were tested using the chi-square test (or Fisher's exact test when expected cell counts were < 5). Relative risks (RR) with 95% confidence intervals (CI) were calculated using the Mantel-Haenszel method. **Multivariable analysis**: Variables with a *P*-value < 0.10 in bivariate analysis were entered into a forward stepwise logistic regression model. The final model included chronic diseases, gravidity, parity, inter-delivery interval, induction of labour, prior VBAC, method of gestational age determination, episiotomy, and birth weight category. Adjusted odds ratios (aOR) with 95% CI were computed. Model calibration was assessed with the Hosmer-Lemeshow test, and discrimination was evaluated using the area under the receiver operating characteristic curve (AUC). A two-sided $P < 0.05$ was considered statistically significant.

RESULTS

Of the 180 women included, 86 (47.8%) achieved successful TOLAC (VBAC), while 94 (52.2%) required repeat caesarean delivery (Fig. 1).

Maternal Characteristics

No significant differences were observed in maternal age between the groups ($P = 0.107$). All women in the failed TOLAC group were aged ≥ 20 years, whereas three (3.5%) in the successful group were < 20 years. The prevalence of chronic diseases was markedly higher among women with failed TOLAC (9.6% vs. 2.3%; $P = 0.040$; RR = 4.45, 95% CI: 0.93–21.19). Women with gravidity < 4 had significantly higher failure rates than those with gravidity ≥ 4 (71.3% vs. 53.5%; $P = 0.014$; RR = 2.158, 95% CI: 1.166–3.994). Similarly, parity < 4 was associated with increased failure, reaching borderline significance (84.0% vs. 72.1%; $P = 0.05$; RR = 2.04, 95% CI: 0.99–4.21). A short inter-delivery interval (≤ 2 years) also tended toward failure (36.2% vs. 23.3%; $P = 0.05$; RR = 1.87, 95% CI: 0.973–3.595). Induction of labour was more frequent in the successful group (20.9% vs. 5.3%; $P = 0.002$; RR = 0.21, 95% CI: 0.075–0.60), suggesting a protective effect. Prior VBAC was significantly more common among successful cases (11.6% vs. 2.1%; $P = 0.01$; RR = 0.16, 95% CI: 0.035–0.78). However, prior vaginal delivery (excluding VBAC) did not differ between groups (30.9% vs. 32.6%; $P = 0.446$). Gestational age determination by LMP was more frequent in the successful TOLAC group (79.1% vs. 67.0%; $P = 0.049$; RR = 0.53, 95% CI: 0.27–1.06). Episiotomy was performed significantly more often in successful deliveries (27.9% vs. 3.2%; $P < 0.001$; RR = 0.085, 95% CI: 0.025–0.29). Abnormal birth weight (< 2500 g or ≥ 4000 g) was also more common in the successful group (19.8% vs. 8.5%; $P = 0.029$; RR = 0.378, 95% CI: 0.154–0.927) (Table 1).

Table 1
Factors Associated with Successful and Failed TOLAC (n = 180)

Factor	Category	Failed TOLAC (n = 94) n (%)	Successful TOLAC (n = 86) n (%)	*P*-value	RR (95% CI)
Age	< 20 years	0 (0.0)	3 (3.5)	0.107	2.133 (1.82–2.49)
	≥ 20 years	94 (100.0)	83 (96.5)		
Chronic diseases	Yes	9 (9.6)	2 (2.3)	**0.040**	4.45 (0.93–21.19)
	No	85 (90.4)	84 (97.7)		
Gravidity	< 4	67 (71.3)	46 (53.5)	**0.014**	2.158 (1.166–3.994)
	≥ 4	27 (28.7)	40 (46.5)		
Parity	< 4	79 (84.0)	62 (72.1)	0.050	2.04 (0.99–4.21)
	≥ 4	15 (16.0)	24 (27.9)		
Time interval from last CS	≤ 2 years	34 (36.2)	20 (23.3)	0.050	1.87 (0.973–3.595)
	≥ 3 years	41 (63.8)	66 (76.7)		
Induction of labour	Yes	5 (5.3)	18 (20.9)	**0.002**	0.21 (0.075–0.60)
	No	89 (94.7)	68 (79.1)		
Prior vaginal delivery	Yes	29 (30.9)	28 (32.6)	0.446	0.92 (0.49–1.73)
	No	65 (69.1)	58 (67.4)		
Prior VBAC	Yes	2 (2.1)	10 (11.6)	**0.010**	0.16 (0.035–0.78)
	No	92 (97.9)	76 (88.4)		
Gestational age	< 37 weeks	0 (0.0)	1 (1.2)	0.478	2.11 (1.81–2.46)
	≥ 37 weeks	94 (100.0)	85 (98.8)		
GA determination	LMP	63 (67.0)	68 (79.1)	**0.049**	0.53 (0.27–1.06)
	Early US	31 (33.0)	18 (20.9)		

Factor	Category	Failed TOLAC (n = 94) n (%)	Successful TOLAC (n = 86) n (%)	*P*-value	RR (95% CI)
Episiotomy	Yes	3 (3.2)	24 (27.9)	**< 0.001**	0.085 (0.025–0.29)
	No	91 (96.8)	62 (72.1)		
Birth weight	Abnormal*	8 (8.5)	17 (19.8)	**0.029**	0.378 (0.154–0.927)
	Normal	86 (91.5)	69 (80.2)		

*Abnormal: <2500 g or ≥ 4000 g. CS, caesarean section; VBAC, vaginal birth after caesarean; LMP, last menstrual period; US, ultrasound; RR, relative risk; CI, confidence interval.

Multivariable Logistic Regression

After adjusting for confounders, four variables remained independent positive predictors of successful TOLAC: induction of labour (aOR = 13.629, 95% CI: 3.511–52.900, $P < 0.001$), episiotomy (aOR = 19.248, 95% CI: 4.811–77.008, $P < 0.001$), gestational age determination by LMP (aOR = 3.650, 95% CI: 1.416–9.409, $P = 0.007$), and abnormal birth weight (aOR = 4.259, 95% CI: 1.324–13.703, $P = 0.015$). Conversely, the presence of chronic diseases independently reduced the odds of success (aOR = 0.099, 95% CI: 0.017–0.559, $P = 0.009$). Gravidity < 4, parity < 4, short inter-delivery interval, and prior VBAC did not retain significance in the final model (Table 2). The Hosmer-Lemeshow test indicated good fit ($\chi^2 = 8.674$, df = 8, $P = 0.371$), and the AUC was 0.782 (95% CI: 0.714–0.850), denoting acceptable discriminative ability.

Table 2
Multivariable Logistic Regression for Successful TOLAC

Variable	Category (Reference)	aOR	95% CI	*P*-value
Chronic disease	Yes (vs. No)	0.099	0.017–0.559	0.009
Gravidity	< 4 (vs. ≥4)	0.584	0.210–1.627	0.304
Parity	< 4 (vs. ≥4)	0.689	0.215–2.202	0.529
Time interval from last CS	≤ 2 years (vs. ≥3 years)	0.499	0.217–1.147	0.102
Induction of labour	Yes (vs. No)	13.629	3.511–52.900	0.001
Prior VBAC	Yes (vs. No)	2.566	0.379–17.363	0.334
GA determination	LMP (vs. early US)	3.650	1.416–9.409	0.007
Episiotomy	Yes (vs. No)	19.248	4.811–77.008	0.001
Birth weight	Abnormal (vs. normal)	4.259	1.324–13.703	0.015

aOR, adjusted odds ratio; CI, confidence interval; CS, caesarean section; VBAC, vaginal birth after caesarean; GA, gestational age; LMP, last menstrual period; US, ultrasound.

Indications for Previous and Current Caesarean Sections

Previous caesarean indications

Malpresentation was the most frequent indication for the index caesarean (34.4%, 62/180), with a similar proportion of success (51.6%) and failure (48.4%) among these women. No progress/obstructed labour accounted for 15.6% of cases, with equal distribution between groups. Pre-eclampsia, PROM, fetal distress, cephalopelvic disproportion, and post-date were other indications, but none showed a statistically significant association with TOLAC outcome (overall *P* = 0.323) (Table 3).

Table 3
Indication of Previous Caesarean Section and TOLAC Outcome

Indication	Total n (%)	Failure n (%)	Success n (%)
Malpresentation	62 (34.4)	30 (16.7)	32 (17.8)
No progress/Obstructed labour	28 (15.6)	14 (7.8)	14 (7.8)
Pre-eclampsia	19 (10.6)	8 (4.4)	11 (6.1)
PROM	13 (7.2)	7 (3.9)	6 (3.3)
Fetal distress	10 (5.6)	6 (3.3)	4 (2.2)
Cephalopelvic disproportion	10 (5.6)	6 (3.3)	4 (2.2)
Post-date	10 (5.6)	5 (2.8)	5 (2.8)
Overall *P*			0.323

PROM, premature rupture of membranes.

Current caesarean indications in failed TOLAC

Among the 94 failures, the leading cause for repeat caesarean was no progress/obstructed labour (36.2%, n = 34), followed by fetal distress (12.8%, n = 12), scar tenderness (10.6%, n = 10), PROM (9.6%, n = 9), malpresentation (9.6%, n = 9), patient refusal (8.5%, n = 8), and other causes (12.7%, n = 12) (Table 4).

Table 4
Indications for Repeat Caesarean Section in Failed TOLAC (n = 94)

Indication	n	%
No progress/Obstructed labour	34	36.2
Fetal distress	12	12.8
Scar tenderness	10	10.6
PROM	9	9.6
Malpresentation	9	9.6
Patient refusal	8	8.5
Others	12	12.7

Discussion

This study provides the first systematic evaluation of TOLAC outcomes in Yemen, revealing a success rate of 47.8% (86/180) at a tertiary referral hospital in Ibb City. This figure is comparable to rates reported in other resource-constrained environments—such as Ethiopia (41.3%) [22] and the United States (52.2%) [14]—but notably lower than the 67.5% pooled global estimate [12]. The observed heterogeneity underscores the critical influence of healthcare infrastructure, patient selection, and clinical protocols on TOLAC success.

The wide international range (41.3%–94.1%) reflects differences in study populations, delivery of care, and practice patterns. Specialised centres with rigorous selection and continuous monitoring, such as those in Iran (94.1%) [21] and China (76.5%) [7], achieve superior outcomes. In contrast, lower rates in low-resource settings likely stem from limited intrapartum monitoring, a shortage of experienced obstetricians, absence of standardised protocols, and a conservative threshold for surgical intervention —factors that are particularly pronounced in Yemen.

Chronic comorbidities profoundly diminished the likelihood of VBAC (aOR = 0.099), consistent with prior reports that maternal diabetes and hypertension adversely affect TOLAC success [9, 21]. The mechanisms likely involve impaired myometrial contractility, placental insufficiency, and clinician-driven caution that prompts earlier caesarean delivery. This finding mandates that women with pre-existing medical conditions receive comprehensive preconception and antenatal optimisation, along with realistic counselling regarding their reduced success probability.

Unexpectedly, induction of labour emerged as a strong positive predictor (aOR = 13.63), contrary to several studies that consider it a risk factor [21, 33]. This paradox is probably explained by selection bias: in our setting, induction is likely reserved for women with the most favourable cervical and obstetric profiles. Moreover, the predominant use of mechanical methods (Foley catheter) rather than

prostaglandins, in line with safety recommendations [4–5], may mitigate the risks traditionally associated with induction. The small number of induced women (n = 23) warrants cautious interpretation and underscores the need for prospective validation.

Episiotomy showed the strongest positive association with success (aOR = 19.25), reflecting its strategic use to expedite the second stage in women already progressing toward vaginal delivery. This is not a causal effect but rather a marker of favourable intrapartum progress. In resource-limited settings, episiotomy may serve as a pragmatic tool to shorten labour and reduce the risk of caesarean when vaginal birth is imminent. However, its routine use should be avoided; clinical indication remains paramount.

Abnormal birth weight (combining low birth weight and macrosomia) was associated with higher success (aOR = 4.26), diverging from most literature that identifies macrosomia as a failure predictor [7, 9]. This counterintuitive result likely arises from the composite category: low birth weight infants, which are easier to deliver, may outweigh the negative impact of macrosomia. In our cohort, the proportion of low-birth-weight infants may have been substantial, or unmeasured confounders (e.g., maternal nutritional status) may have influenced both birth weight and labour dynamics. Further studies with finer birth-weight stratification are required.

Although prior VBAC was significant on univariate analysis (RR = 0.16), it lost significance in multivariable modelling, likely due to the small number of such women (n = 12) and confounding by other favourable characteristics. This does not diminish its clinical relevance; previous successful VBAC remains one of the strongest predictors in larger cohorts [24–25].

The preponderance of obstructed labour (36.2%) and fetal distress (12.8%) as indications for repeat caesarean underscores the importance of vigilant intrapartum monitoring and timely intervention. Scar tenderness (10.6%) reflects clinicians' heightened awareness of possible uterine dehiscence—a prudent approach given limited surgical back-up. Patient refusal (8.5%) highlights the psychological dimension of TOLAC, reinforcing the need for effective communication and emotional support.

Strengths and Limitations

Strengths include: (i) first-ever TOLAC study in Yemen, providing baseline data for a conflict-affected, low-income country; (ii) rigorous data extraction using a validated checklist; (iii) comprehensive multivariable adjustment; and (iv) a relatively large sample for this setting. **Limitations** are: (i) retrospective design with potential information bias, especially for poorly documented variables (e.g., BMI, Bishop score); (ii) single-centre nature limiting generalisability; (iii) modest sample size precluding extensive subgroup analyses; (iv) lack of BMI data, a known predictor; (v) small number of induced women, limiting the robustness of that finding; (vi) absence of detailed neonatal outcomes and uterine rupture data; and (vii) potential selection bias inherent to retrospective cohorts.

Conclusions and Recommendations

This study elucidates that successful trial of labour after caesarean in Yemen is governed by a multifaceted interplay of maternal, obstetric, and intrapartum determinants, with an overall success rate approaching half of all attempts. Chronic comorbidities profoundly diminish the likelihood of vaginal birth after caesarean, whereas induction of labour, episiotomy, and abnormal birth weight are associated with favourable outcomes, while obstructed labour and fetal distress predominated among failures, underscoring the critical importance of vigilant intrapartum surveillance. Women with pre-existing conditions merit comprehensive preconception counselling and rigorous medical optimisation before labour, and implementation of standardised protocols, enhanced monitoring, and patient-centred communication is indispensable. Policy must prioritise provider training, monitoring infrastructure, and emergency care, while future multicentre studies should validate findings, develop a local prediction model, and assess neonatal outcomes, alongside implementation and cost-effectiveness research to guide clinical translation and resource allocation in humanitarian settings.

Abbreviations

TOLAC
Trial of Labour After Caesarean
VBAC
Vaginal Birth After Caesarean
WHO
World Health Organization
ACOG
American College of Obstetricians and Gynecologists
BMI
Body Mass Index
LMP
Last Menstrual Period
RR
Relative Risks
95% CI
95% Confidence Intervals
aOR
Adjusted Odds Ratios
CS
Caesarean Section
GA
Gestational Age

Declarations

Ethics approval and consent to participate

The study received ethical approval from the Research Ethics Committee of the Faculty of Medicine and Health Sciences, Ibb University (Approval No. 2024/EC/OBG/001, dated 15 June 2024). Institutional permission was granted by the Hospital Administration of Al Thawra Hospital. Owing to the retrospective, anonymised nature of the data, the requirement for informed consent was waived in accordance with the Declaration of Helsinki and national regulations.

Clinical trial number: Not applicable.

Consent for publication: Not applicable.

Data availability

The datasets used and analyzed during this analysis are available from the corresponding author, who will provide any relevant data upon reasonable request.

Competing Interests Not applicable

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Conflict of interest

The authors declare that they have no competing interests.

Author's contribution

Al Sarmi A and Shomais A designed the study; Al-Falahi G, Abdulhafiz Z, and AlGumaei R collected the data; Saleh N, Alalawy R, and Obadi S processed the data; Alhammadi B, Abdusamie K, Albukhaiti M, and Shomais A analyzed and interpreted the data. Al Sarmi, Altam T, and Alhendi Z wrote the first draft manuscript. Edrees W and Al-Shehari W reviewed and edited the final manuscript. All authors revised and approved the manuscript for submission.

Author details

Ansia Al Sarmi

Department of Obstetrics and Gynecology, Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen; aneesaismail78@gmail.com

Abdulrakeeb Shomais

Scientific research unit, Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen; gadgadw2@gmail.com , https://orcid.org/0009-0003-4304-6615

Ghaida Al-Falahi

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, ghaidaabdullahalfalahi@gmail.com

Zainab Abdulhafiz

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, Zainabmokhtar99@gmail.com

Rofaida AlGumaei

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, mohammedrfrf820@gmail.com

Balqees Alhammadi

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, blkesmhd1234@gmail.com

Khawla Abdusamie

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, Khawlaabdulelah11@gmail.com

Marya Albukhaiti

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, maryaalbukhiti@gmail.com

Najwa Saleh

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, Znoga423@gmail.com

Rana Alalawy

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, ranaaa.adelll123@gmail.com

Sara Obadi

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen

Taiseer Altam

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, Taltam793@gmail.com

Zahra Alhendi

Faculty of Medicine and Health Sciences, Ibb University, Ibb, Yemen, zahraalhendi42@gmail.com

Wadee Abdullah Al-Shehari

Medical Microbiology Department, Faculty of Medical Sciences, Ibb University, Ibb, Yemen, dr.wadee40@yahoo.com; https://orcid.org/0000-0002-3375-0559

Wadhah Hassan Edrees

Medical Laboratory Department, Faculty of Medicine and Health Sciences, Hajjah University, Hajjah, Yemen, edress2020@gmail.com; https://orcid.org/0000-0002-7799-0466

Medical Laboratory Department, Faculty of Medical Sciences, Al-Razi University, Sana'a, Yemen

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Figures

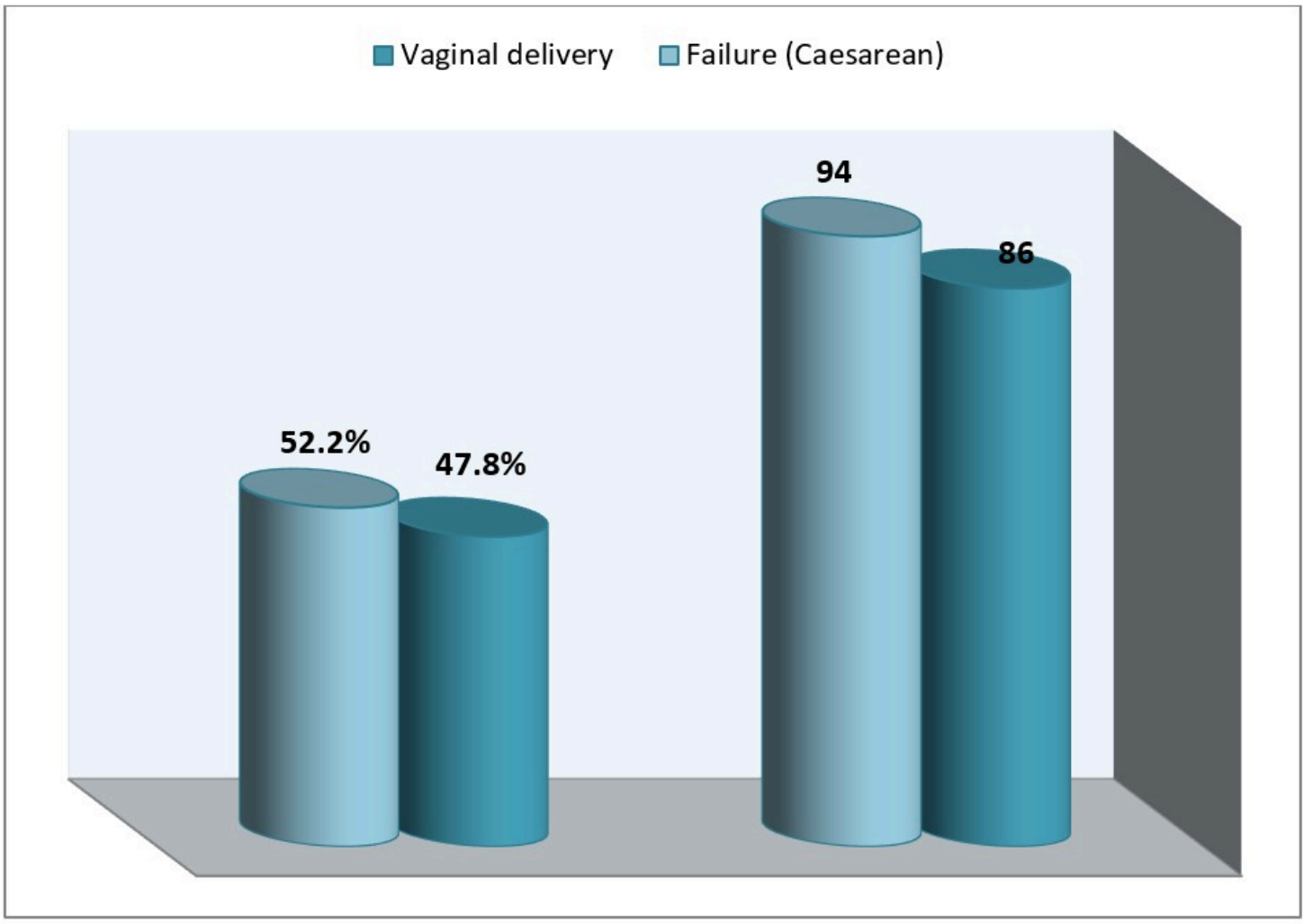


Figure 1

Success of TOLAC