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Original article

Factors and Outcomes Associated with Successful Vaginal Birth After Cesarean Section

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Abstract
Achieving a successful vaginal birth after caesarean delivery is wanted but risky. This study aimed to estimate the rate of successful vaginal delivery after caesarean section in Al-Bayda Medical Center and associated factors. A case series study included a review of records of women with previous caesarean deliveries who underwent a trial of vaginal birth in Al-Bayda medical center during the years 2023/ 2024. Statistical analysis was done using SPSS 23.0. A success rate of 13.7% with statistically significant favorability of older age, higher parity, and gravidity. No statistically significant differences were found regarding baby size. Labor should be tried in mothers with a previous caesarean regardless of previous history, with careful individual evaluation of the case. Further well-designed research is recommended.
Keywords. *Vaginal Birth After Cesarean Section, Factors and Outcome.*

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Introduction

Successful vaginal birth after caesarean section (VBAC) is more comfortable than repeat emergency or elective caesarean section. Birth management might be challenging when the patient arrives at an emergency room, but antenatal assessment is crucial when choosing to try labour [1]. A lady having a prior cesarean delivery has two alternatives for mode of delivery in the subsequent pregnancy: A planned repeat caesarean section (PRCD) or to attempt a vaginal birth following caesarean VBAC, a trial of labour after caesarean (TOLAC) [2]. According to the World Health Organization's (WHO) most recent declaration on caesarean sections (CS), no region should have a CS rate greater than 10%, and CS should only be performed when medically necessary because it can cause serious and long-term complications [3]. In England, the rate of caesarean deliveries was 25.5% in 2012–2013; most of these were emergency (14.8%) rather than elective (10.7%). In Wales, Northern Ireland, and Scotland, the percentages were 27.5%, 29.8%, and 27.3%, respectively. Counselling women for VBAC delivery is therefore crucial [4]. Most women with a singleton pregnancy with cephalic presentation at 37 weeks or later who have had one prior lower uterine segment cesarean delivery, with or without a history of prior vaginal birth, can benefit from planned VBAC [5]. With an 83–95% success rate, women who have given birth vaginally at least once are 9–28 times more likely to have a successful VBAC [6].

The prior indication for caesarean, such as Breech presentation or other non-recurring indication (e.g., non-reassuring fetal monitoring) for the prior caesarean delivery, significantly increases the chance for a vaginal delivery, 85% compared with caesarean delivery done for recurring indication such as dystocia or failure to progress. This is equivalent to the vaginal delivery rate in nulliparous women. However, approximately 60–70% of women who have TOLAC for dystocia (failure to progress) give birth vaginally [7]. It has been established that the inter-delivery interval (IDI) is linked to poor outcomes for mothers and newborns. However, the appropriate IDI in TOLAC remains uncertain, aimed to explore the association between IDI and important maternal and newborn outcomes in women who underwent TOLAC [8].

Given that the rate of uterine rupture linked with birth weights over 4000g does not seem to be significantly higher than that of lower birth weights, TOLAC may be a reasonable clinical option for pregnant women with probable delivery weights over 4000g. However, women whose newborns weigh more than 4250g may need to exercise some caution when considering a labour trial. In these mothers with newborns weighing > 4000g, the likelihood of successful vaginal birth, however lower than for neonates weighing < or = 4000g, is still 60% [9]. Therefore, this study aimed to estimate the rate of VBAC in Al-Bayda Medical Center and to determine the factors affecting the success rate of VBAC.

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Methodology

Study Design

A case series study at Al-Bayda Medical Center deliveries during the years 2023/ 2024.

Inclusion Criteria

The study included all patients with a history of previous one cesarean section with the following inclusion criteria: One previous lower transverse cesarean delivery. No other uterine scar or previous rupture. Gestational age > 37 weeks and Single fetus. General and obstetric examination, including per-vaginal examination to determine cervical effacement and dilatation, and head station.

Data Analysis

Chi-square analysis has been performed using the Statistical Package for the Social Sciences (SPSS) software version 23.0 (IBM) (and Fisher's exact test appropriately). Numerical variables were compared between groups using either the Mann-Whitney U test or the Student t test.

Results

A total of 146 cases with previous caesarean delivery in Al-Bayda medical center during the years 2023/ 2024 were investigated.

General and demographic characteristics

The measured outcome was conversion to caesarean delivery. The rate was only 13.7%. The age range of the participants was 20 to 42, with a mean of 31.1 (±SD 5.2); median =32. One third of the cases were within advanced maternal age, as shown in (Figure 1). Range of Gravidity was 2 to 12, mean (±SD); median =4. Range of parity was 1 to 11, mean (±SD); median =3. (Figure 2). Range of abortions was 0 to 3, mean (±SD); median =0. See (Figure 3).

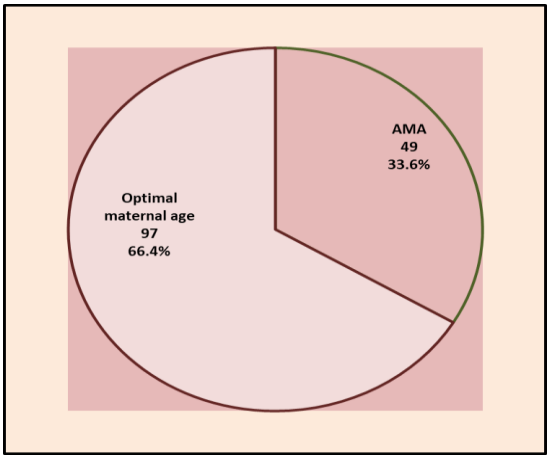

Figure 1. Advanced maternal age (AMA) distribution among the study population. AMA: maternal age of ≥ 35 years.

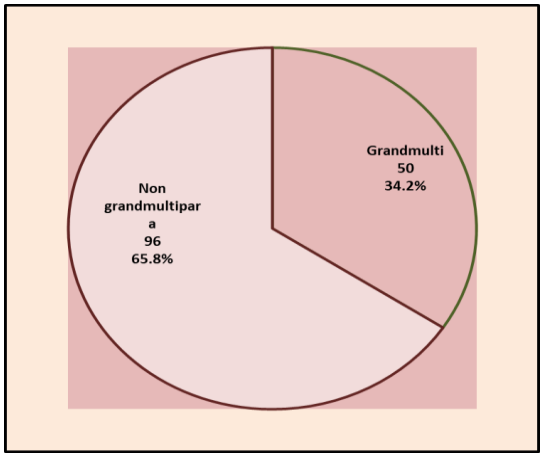

Figure 2. Parity categories distribution among the study population.

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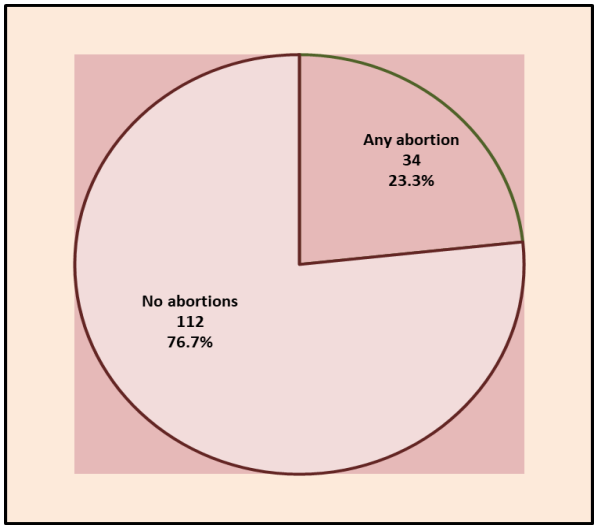

Figure 3. Distribution of the study population according to history of abortion.

Characteristics of the previous deliveries

The range of previous caesarean sections was 1 to 10, mean (±SD); median =1. Range of intervals after last caesarean section in years was 1 to 14, mean 4.1 (±SD 2.8); median =3 as shown in (Figures 4 and 5).

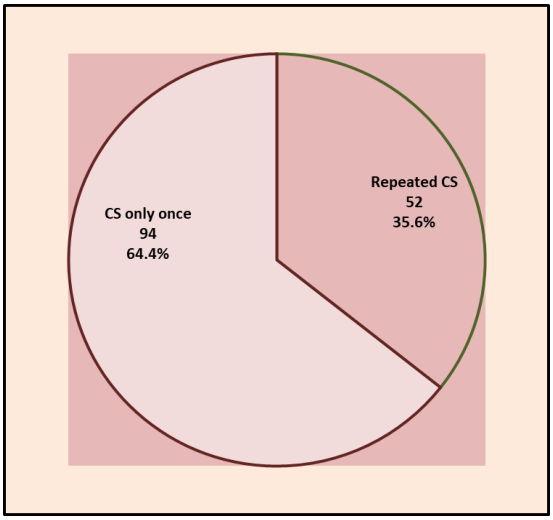

Figure 4. Distribution of the study population according to the number of CS.

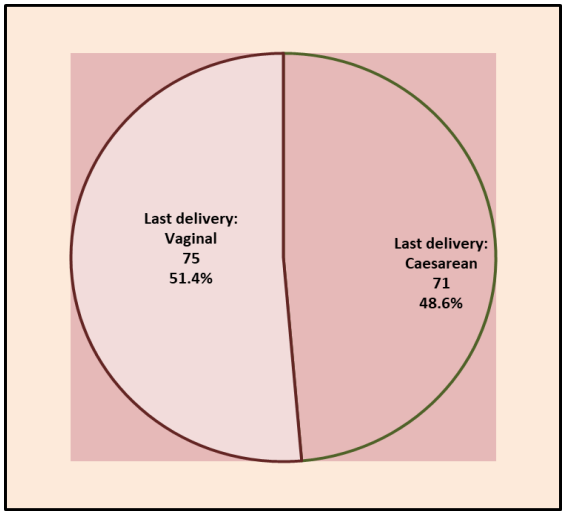

Figure 5 Distribution of the study population according to mode of the last delivery.

Characteristics of the neonate

The gender of the newborn is shown in (Figure 6). The range of baby weights in kilograms was 2.4 to 5.5, with a mean 3.6 (±SD 0.5); median =3.6, (Figures 7 and 8) show the rates of macrosomia and low birth weight, respectively. Only one reported case of stillbirth. (Figure 9).

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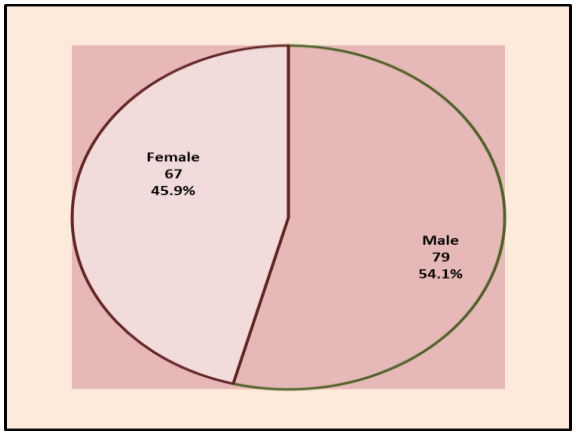

Figure 6. Distribution of the study population according to the gender of the baby.

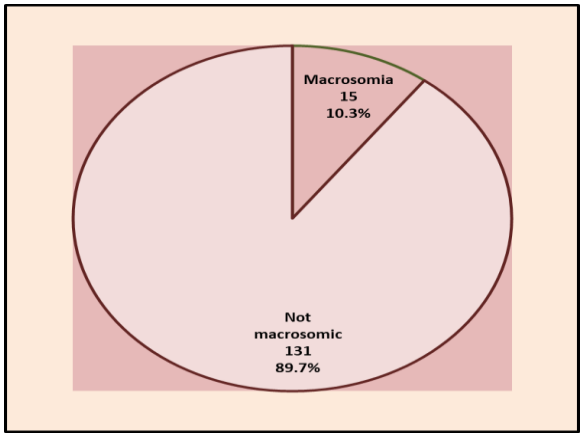

Figure 7. Distribution of the study population according to macrosomia of the baby (birth weight ≥ 4.0 kg).

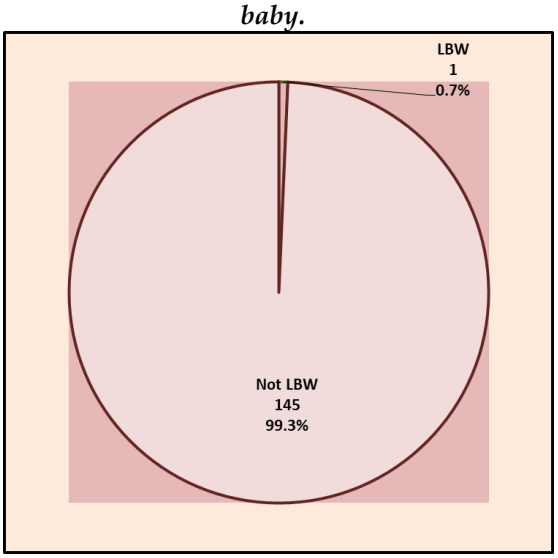

Figure 8. Distribution of the study population according to low birth weight (LBW) of the baby (birth weight < 2.5 kg).

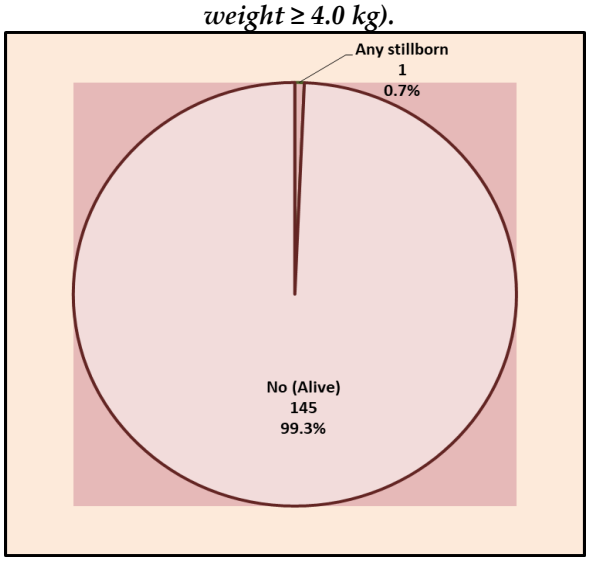

Figure 9. Distribution of the study population according to outcome of stillbirth

Analysis of differences of demographic and general characteristics according to the outcome shows statistically significant age differences; not in the rate of advanced maternal age, in the number of gravidity (previous reported pregnancies), and parity (previous births). See (Table 1).

Table 1. Analysis of differences in demographic and general characteristics according to the outcome.

Characteristic	Conversion to Caesarean delivery	Proceed in Vaginal delivery	*P*
Age in Years	range: 22 to 39, mean± SD: 28.5±5.0 [median: 26.5]	range: 20 to 42, mean± SD: 31.5±5.1 [median: 32]	0.017 M
AMA	20.0%	35.7%	0.167 C
Gravida	range: 2 to 9, [median: 2]	range: 2 to 12, [median: 5]	0.001 M
Parity	range: 1 to 6, [median: 1]	range: 1 to 11, [median: 3]	0.001 M
Abortions	range: 0 to 3, [median: 0]	range: 0 to 3, [median: 0]	0.357 M
Grand- multigravida	15.0%	37.3%	0.510 C
Any abortion	15.0%	24.6%	0.410 F

*AMA: Advanced maternal age. %: proportion of the characteristics within the outcome group. SD: Standard deviation. (F) P by Fisher's exact test. (C) P by Chi square test. (M) P by Mann-Whitney U test * Significant difference at 95% level of confidence.*

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Analysis of differences in characteristics of previous caesarean deliveries according to the outcome shows a statistically significant difference only in the number of caesarean deliveries regarding the range of caesarean deliveries. See (Table 2).

Table 2. Analysis of differences in characteristics of previous caesarean deliveries characteristics outcome.

Characteristic	Conversion to Caesarean delivery	Proceed in Vaginal delivery	*P*
Repeated CS	15.0%	38.9%	0.380 C
Last delivery Caesarean	65.0%	46.3%	0.115 C
Previous CS	range: 1 to 5, [median: 1]	range: 1 to 10, [median: 1]	0.038 M
Interval in years	range: 2 to 12, mean± SD: 4.1±2.8 [median: 3]	range: 1 to 14, mean± SD: 4.1±2.9 [median: 3]	0.732 M

*CS Caesarean section. %: proportion of the characteristics within the outcome group. SD: Standard deviation. (F) P by Fisher's exact test. (C) P by Chi square test. (M) P by Mann-Whitney U test * Significant difference at 95% level of confidence.*

Analysis of differences in newborns' characteristics according to the outcome shows no statistically significant differences in the outcome. See (Table 3).

Table 3. Analysis of differences in newborns' characteristics according to the outcome.

Characteristic	Conversion to Caesarean delivery	Proceed in Vaginal delivery	*P*
Male Gender	5.0%	54.8%	0.691 C
Birth weight in Kilograms	range: 2.8 to 5.2, mean± SD: 3.9±0.7 [median: 3.6]	range: 2.4 to 5.5, mean± SD: 3.6±0.4 [median: 3.6]	0.131 M
Macrosomia	3.0%	7.7%	0.700 F

*%: proportion of the characteristic within the outcome group. SD: Standard deviation. (F) P by Fisher's exact test. (C) P by Chi square test. (M) P by Mann-Whitney U test * Significant difference at 95% level of confidence.*

Discussion

The present study is a descriptive study conducted on 146 cases of vaginal birth trials in Al-Bayda Medical Center in the years 2023/ 2024. Regarding Age, the range of age was 20 to 42, with a mean of 31.1, and advanced maternal age (AMA) exhibited a rate of 49/146 (33.6%), while Optimal maternal age among the study population was 97/146 (66.4%). Regarding obstetric experiences, the range of Gravida among the study population was 2 to 12. The range of abortions was 0 to 3. In addition, the study population included individuals with any abortion, 34/146 (23.3%). Regarding the previous CS, the range of the previous CS was 1 to 10. The study population of individuals with repeated CS was 52/146 (35.6%). The range of intervals after the last CS in years was 1 to 14. The study population of individuals with CS only once was 94/146 (64.4%). The study population included individuals with the last delivery where Caesareans were 71/146 (48.6%).

Regarding characteristics of the newborn, the study population individuals with male babies were 79/146 (54.1%), while the study population individuals with female babies were 67/146 (45.9%). The range of baby weights in kilograms was 2.4 to 5.5. The study population individuals with Macrosomia were 15/146 (10.3%), the study population individuals with LBW were 1/146 (0.7%). Only one case of stillbirth was reported (0.07%). Regarding the measured outcome, the study population individuals with Conversion to caesarean delivery were 20/146 (13.7%). This result shows a promising concordance with some recently published research [10, 11]. Regarding the comparative analysis of age (in Years), those who underwent conversion to caesarean delivery had an age range: 22 to 39, while among those who successfully proceeded into vaginal delivery age range was 20 to 42. On the other hand, despite the apparent, advanced maternal age (AMA) was not statistically different across the outcome categories. The rate of women with AMA 20.0%, while the rate was 35.7% (*P*= 0.017). Those results are inconsistent with previous studies [12, 13]. This may be explained by other factors like higher parity and lower maternal age in our society in comparison to other societies, where the studies exhibited contradictory results.

Regarding gravidity, those who underwent conversion to caesarean delivery had a gravidity range: 2 to 9, while among those who successfully proceeded into vaginal delivery, the range was 2 to 12. Similarly, parity shows a statistically

significant difference; those who underwent conversion to caesarean delivery parity range: 1 to 6. While among those who successfully proceeded into vaginal delivery, the range was 1 to 11. Abortions, grand-multigravidity, repeated CS, last delivery caesarean, interval in years, and neither the neonatal characteristics showed a statistically significant difference. This finding is in controversy with Girma *et al* and Elkousy *et al*., who identified macrosomia as a risk factor that might preclude trial of labor after caesarean [12, 14]. TOLAC and VBAC in the local society seem promising and should not be overlooked. Labor should be tried in mothers with a previous caesarean, regardless of previous history, with careful individual evaluation of the case. Further, well-designed research is recommended.

Conclusion

The present study concludes that the current practice in Al-Bayda Medical Center regarding trials of VBAC. A success rate of 13.7% with statistically significant favorability of older age, higher parity, and gravidity for success.

Conflict of interest. Nil

References

1. Senturk MB, Cakmak Y, Atac H, Budak MS. Factors associated with successful vaginal birth after cesarean section and outcomes in rural area of Anatolia. Int J Womens Health. 2015;10:693-697.
2. Berghella V, editor. Maternal-fetal evidence based guidelines. Trial of labor after cesarean section. London: Informa Healthcare; 2012. p. 161-173.
3. World Health Organization Reproduction Program. WHO statement on caesarean section rates. Reprod Health Matters. 2015;23(45):149-150. doi:10.1016/j.rhm.2015.07.007.
4. Royal College of Obstetricians and Gynaecologists. Birth after previous caesarean birth. Green-top Guideline No. 45. London: RCOG; 2015. p. 1-31.
5. Ferede YA, Habitu YA, Tassew WC, Bitew DA. Prevalence of successful vaginal birth after caesarean section and its associated factors among women delivered in the University of Gondar comprehensive specialized referral hospital, Northwest Ethiopia. Contracept Reprod Med. 2025;10(1):29.
6. Caughey AB, Shipp TD, Repke JT, Zelop C, Cohen A, Lieberman E. Trial of labor after cesarean delivery: the effect of previous vaginal delivery. Am J Obstet Gynecol. 1998;179(4):938-941.
7. Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu R, et al. Vaginal birth after cesarean: new insights. Evid Rep Technol Assess (Full Rep). 2010;(191):1-397.
8. Maroyi R, Naomi B, Moureau MK, Marceline BS, Ingersoll C, Nerville R, et al. Factors associated with successful vaginal birth after a primary cesarean section in women with an optimal inter-delivery interval. Int J Womens Health. 2021;13:903-909.
9. Zelop CM, Shipp TD, Repke JT, Cohen A, Lieberman E. Outcomes of trial of labor following previous cesarean delivery among women with fetuses weighing >4000 g. Am J Obstet Gynecol. 2001;185(4):903-905.
10. Tesfahun TD, Awoke AM, Kefale MM, Balcha WF, Nega AT, Gezahegn TW, et al. Factors associated with successful vaginal birth after one lower uterine transverse cesarean section delivery. Sci Rep. 2023;13(1):8871. doi:10.1038/s41598-023-36027-1.
11. Masoom K, Asif R, Aara Y, Javaid N, Luqman S, Naeem S. Vaginal birth after cesarean section (VBAC) success rate and predictors of success in a tertiary care hospital. J Soc Obstet Gynaecol Pak. 2021;11(2):75-81.
12. Girma Y, Menlkalew Z, Destaw A. Vaginal delivery after caesarean section and its associated factors in Mizan Tepi University Teaching Hospital, Southwest Ethiopia. Heliyon. 2021;7(11):e08206.
13. Mekonnin FT, Bulto GA. Determinants of successful vaginal birth after caesarean section at public hospitals in Ambo Town, Oromia Region, Central Ethiopia: a case-control study. Risk Manag Healthc Policy. 2021;14:4083-4091.
14. Elkousy MA, Sammel M, Stevens E, Peipert JF, Macones G. The effect of birth weight on vaginal birth after cesarean delivery success rates. Am J Obstet Gynecol. 2003;188(3):824-830.