ORIGINAL ARTICLE

FREQUENCY OF VAGINAL BIRTH AFTER CAESAREAN SECTION AND ITS FETOMATERNAL OUTCOME

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Background: Vaginal birth after caesarean section (VBAC) is associated with reduced blood loss and transfusions, fewer infections, and fewer thromboembolic events as compared to caesarean delivery. The current rate of repeat caesarean after one previous caesarean is above the WHO standard of 15%. We aimed to determine the occurrence of VBAC and to determine the occurrence of feto-maternal outcomes in successful VBAC cases so that trials of VBAC can be given to carefully selected patients to reduce the rate of repeat caesarean section. **Methods:** The Combined Military Hospital (CMH) Rawalpindi's Obstetrics and Gynaecology department conducted this cross-sectional study from March 20 to September 19, 2021. After obtaining ethical committee approval, data was collected using a non-probability, consecutive sampling technique from 150 patients on a self-developed structured proforma. Patients between the age range of 20–35 years with a history of previous lower segment caesarean section, having gestational age between 37–41 weeks and who presented in spontaneous labour were included in this study. After taking informed consent, all women were given a trial of labour and the outcome of the trial was noted. Women were followed for the feto-maternal outcomes. The gathered information was analysed using SPSS version 25.0. Post-stratification, a *p*-value of 0.05 or lower on the chi-square test was deemed statistically significant. **Results:** Following a C-section, 28.67% of patients experienced successful vaginal births. PPH was found in 2.32%, scar dehiscence in 0.0%, low birth weight babies in 16.28%, APGAR score <7 at 1 minute was 23.26% and NICU admission as 9.30% in women undergoing vaginal birth after caesarean section. **Conclusion:** Appropriate selection of patients for the trial of VBAC can help reduce the higher rate of repeat caesarean section after a previous caesarean section and increase the chances of successful vaginal birth.

Keywords: Vaginal Birth after Caesarean Section; VBAC; Caesarean Section; Vaginal Birth; Complications of VBAC; Feto-maternal Outcomes

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INTRODUCTION

The expected rate of caesarean section by the World Health Organization (WHO) is 15% however; analyses of the prevailing trends show an increase from 6.7% in 1990 to 19.1% in 2014.[1] Over the past 20 years, there has been a threefold increase in the likelihood that a woman will have a caesarean section.[2] There is a great regional variation in the prevalence of caesarean section ranging from 6–66.5%.[1–3] Reasons for going for caesarean delivery include increased maternal age, decreased parity, maternal obesity, foetal distress, maternal request due to fear of the pain of the vaginal delivery, etc.[4] Compared to vaginal delivery, caesarean sections are linked to longer maternal hospital stays, more blood loss and transfusions, more frequent hospital-acquired infections, and thromboembolic events.[5]

The belief in the importance of natural birth is that it has an impact on mother-baby bonding, maternal health, and most importantly avoiding future obstetric complications has provoked a trend of VBAC along with the rising trends of caesarean section.[3,6] The success rate of VBAC as reported in the literature varies from 26–73.9% and especially higher success rates have been reported in cases where the first caesarean was done for a non-recurring indication.[7–10] Poor labour progress, foetal distress, placenta previa, transverse lie, breech presentation, oblique lie, pregnancy-

induced hypertension, and twins are a few non-recurring reasons for a caesarean section.[11]

With a singleton pregnancy with a cephalic presentation at 37+0 weeks or later and a single prior lower segment caesarean section, with or without a history of prior vaginal birth, and with a healthy inter-pregnancy interval, VBAC may be an option.[2,12,13] Previous vaginal delivery, especially prior VBAC, which is linked to an approximate 87–90% planned VBAC success rate, is the lone factor that best predicts a successful VBAC.[4,14] For better perinatal outcomes in VBAC, the history of caesarean section and scar thickness should be checked by the maternity team followed by antenatal counselling of the mother and family should be done before making the final decision on the mode of delivery.[4] In counselling, all the risks and benefits should be conveyed to the patient and family in a written documented form as risk-dependent counselling results in better perinatal outcomes.[6,14] Management of such patients and arrangements of all necessary measures in such cases are associated with better perinatal outcomes.[15,16]

Although studies are done locally on the success rate of VBAC, the available local data is scarce and research is required as there is a significant variation in the success rate of VBAC according to the available local and international data. Therefore, we aimed to determine the success rate of VBAC among women with a prior caesarean section at our institution. By doing so, we aimed to shed light on the feasibility and safety of VBAC as a birth option within our local population. Furthermore, we sought to investigate the feto-maternal outcomes in cases where VBAC was successfully achieved. This assessment was crucial in understanding the potential benefits and risks associated with VBAC, allowing us to provide evidence-based guidance to healthcare providers and expectant mothers.

MATERIAL AND METHODS

The Combined Military Hospital (CMH) Rawalpindi's Obstetrics and Gynaecology department conducted this cross-sectional study from March 20 to September 19, 2021. After obtaining ethical committee approval, data was collected using a non-probability, consecutive sampling technique from 150 patients on a self-developed structured proforma. Patients between the age range of 20–35 years with a history of previous lower segment caesarean section, having gestational age between 37–41 weeks and who presented in spontaneous labour were included in this study. Patients with multiple pregnancies, PIH, Pregnancy induced DM, bony pelvic deformity or contracted pelvis assessed on vaginal examination, uterine anomalies; malposition, mal-presentation and abnormal placental localization were excluded from the study. After obtaining informed consent, all women were given a trial of labour in the labour room and successful VBAC was noted. Unsuccessful cases were shifted to operation theatre and emergency caesarean sections were performed. VBAC successful cases were followed and feto-maternal outcomes, i.e., scar dehiscence, PPH, low birth weight, Apgar score <7 at 1 minute and NICU admission were noted on the *proforma*.

The collected information was analyzed by computer software SPSS version 25.0. For continuous variables like age, gestational age, and BMI means and SD were computed; frequencies and percentages were used for qualitative variables like parity and Apgar score. By stratification, effect modifiers such as age, gestational age, parity, BMI, and the number of prior CS were managed. Using the post-stratification chi-square, a p-value of 0.05 or lower was deemed statistically significant.

RESULTS

There were 150 patients in total who had previously undergone a caesarean section and were given the vaginal birth trial. Table-1 shows the frequencies and percentages of demographic parameters of these patients. The patients that were a part of this study ranged in age from 20–35 years, with a mean age of 28.41±4.56 years. The majority of the patients, 82/150 (54.67%), were in the 20–30 age bracket. The average gestational age was 38.46±1.35 weeks. Median parity was 2 while Mean parity was 1.73±0.76. The mean height of the patients was 156.43±11.98 cm and the mean weight was 78.96±7.89 kg. The mean BMI of the patients was 24.71±4.78 kg/m2.

The incidence of vaginal birth after caesarean section (VBAC) trial outcomes are depicted in a pie chart in Figure-1. As can be seen, the trial of VBAC was successful in 43 (28.67%) patients. Caesarean section was done in the failed cases.

Table-2 shows the frequency of feto-maternal outcomes in successful VBAC cases. In this study, PPH was observed in 1/43 (2.32%), scar dehiscence occurred in none of the patients, 16.28% of babies had low birth weight, Apgar score <7 at 1 minute was noted in 10/43 (23.26%) and NICU admission was done in 4/ 43 (9.30%) patients.

Table-3 shows the cross-tabulation of the outcome of VBAC trials with the categories of age, gestational age, parity, and BMI. The chi-square test was applied to check for any significant difference in the categories concerning successful and unsuccessful outcomes of the VBAC trials. As can be seen in Table-3, only parity had a significant difference with respect to the success of the VBAC trial at a Chi-Square *p*-value of 0.036, where the VBAC trial was successful in a significantly greater number of patients having parity ≤2 as compared to those having parity >2. No significant association of the success of VBAC was noted with any other parameters.

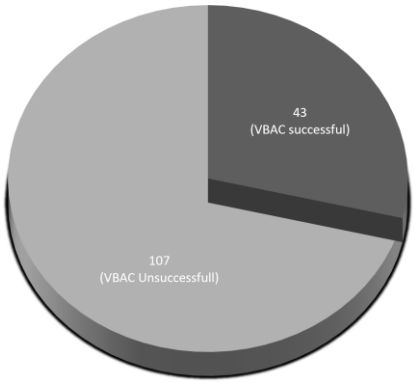

Figure-1: Pie-chart representing the incidence of vaginal birth after caesarean section trial outcomes

Table-1: Frequencies and percentages of demographic parameters of the patients

Parameter	Reference	Frequency (n=150)	Percentage
Age (Years)	20–30 years	82	54.67
	30–35 years	68	45.33
Gestational Age (weeks)	37–39	111	74.00
	40–41	39	26.00
Parity	≤2	134	89.33
	>2	16	10.67
BMI (kg/m^2)	≤30	131	87.33
	>30	19	12.67

Table-2: Frequencies and Percentages of Feto-maternal outcome in successful VBAC cases

Feto-maternal outcome	Frequency (n=43)	Percentage
Uneventful	21	48.84
PPH	01	2.32
Low birth weight	07	16.28
Apgar score < 7 at 1 minute	10	23.26
NICU admission	04	9.30
Scar dehiscence	00	0.0

Table-3: Cross-tabulation of the outcomes of VBAC trials with the categories of age, gestational age, parity, and BMI

Studied Parameters		Yes(n=43)	No(n=107)	*p*-value
Age (years)	20-30	25 (30.49%)	57 (69.51%)	0.588
	31-35	18 (26.47%)	50 (73.53%)	
Gestational Age (weeks)	37-39	29 (26.13%)	82 (73.88%)	0.246
	40-41	14 (35.90%)	25 (64.10%)	
Parity	≤2	42 (31.34%)	92 (68.66%)	0.036
	>2	01 (6.25%)	15 (93.75%)	
BMI (kg/m^2)	≤30	40 (30.53%)	91 (69.47%)	0.184
	>30	03 (15.79%)	16 (84.21%)	

DISCUSSION

Efforts are being made to reduce the rates of caesarean section to the WHO recommended rate of 15% by employing strategies such as the trial of labour after caesarean (TOLAC), but still an increase to 21% has been observed in the rates of caesarean section worldwide in the last two decades with a projected rate at 29% by 2030.[17,18] One of the most important contributing causes to the overall increasing Caesarean Section incidence is repeated caesarean after a prior caesarean section.[19]Although a failed VBAC attempt carries a higher risk of complications than an elective repeat CS, VBAC is still considered to be generally safe when compared to the morbidity and financial burden associated with repeat CS.[20,21] VBAC offers the last chance for a woman who has had a previous caesarean delivery to have a normal birth. Even so, VBAC rates have considerably decreased.[21]

The number of study participants who had a successful vaginal birth after caesarean sections was 43/150 (28.67%). PPH was found in 2.32%, scar dehiscence in 0.0%, low birth weight babies in

16.28%, APGAR score <7 at 1 minute was 23.26% and NICU admission as 9.30% in women undergoing vaginal birth after caesarean section. The success rate of trial of VBAC in our population is lower than most reports but the other features correlate well with the current literature. The success rate for VBAC has been reported in the range of 46.0–73.9%.[9,10] A study reported the frequency of low-birth-weight babies of 20.5%, APGAR score <7 at 1 minute of 24.1% and NICU admission rate of 5.1% in women undergoing vaginal birth after caesarean section. Fifteen Another study showed postpartum haemorrhage in 3.0% and scar dehiscence in 4.6% of women.[16] A study on 200 patients undergoing VBAC having a single previous caesarean section, reported uterine rupture in 2/200 (1.0%) patients. Scar dehiscence was seen in 7.69% of cases, post-partum haemorrhage in 10% of patients, Pre-term Pregnancy in 8% of patients, and 12.95% required admission to the Neonatal Intensive Care Unit.[22]

In a local study, out of 62 patients given a trial of VBAC, 21 (33.3%) delivered successfully. One patient each suffered from partial scar dehiscence, PPH, blood transfusion, and puerperal pyrexia in the successful VBAC group. A total of 24 patients in the emergency C/section group received blood transfusions; 8 of them had puerperal pyrexia, and 7 had PPH. Two neonates from the successful VBAC group required ICU admission due to low Apgar scores, while five neonates from the emergency C/section group required ICU admission due to low Apgar scores.[23]

In a different study, 188 women who had previously given birth by caesarean section were offered the opportunity to try vaginal delivery; the study found that 66.9% of these women successfully had a VBAC. The success rate of VBAC was also classified based on obesity, with Class I obese women reporting a success rate of 63.2% and Class II-III obese women reporting an 80.0% success rate, respectively, compared to 71.4% for women in the normal BMI category.[24] In a study on 50 patients having previous scars who were subjected to VBAC, the results showed that birth weight and previous scar thickness had a significant role in the prospects of successful VBAC.[21]

In a study of 395 patients who had previously undergone a caesarean section, 90.1% of the patients chose vaginal delivery. A trial of VBAC was offered to the 190 qualified candidates, of whom 95/190 (about 50%) had a successful VBAC. In this investigation, there were no cases of uterine rupture, newborn fatalities, or maternal deaths. When compared to women who underwent an elective repeat Caesarean section, vaginal deliveries were substantially more likely to result in APGAR scores below 7 in the first minute (p=0.03).[25] Well-timed prenatal counselling to discuss a patient's prospects for VBAC success and associated risks and benefits play a crucial role in the decision-making process regarding the mode of delivery.

By presenting these findings, we contribute to the existing body of literature and offer a localized perspective, which may vary from international data. Additionally, the feto-maternal outcomes in cases where VBAC was successful were scrutinized, enabling a better understanding of potential risks and benefits. Our investigation adds new information by providing a comprehensive analysis of VBAC success rates and feto-maternal outcomes within our specific local setting. The results of this study contribute to a better understanding of VBAC feasibility and safety, allowing healthcare providers to make informed decisions while guiding expectant mothers with a history of caesarean section toward the most appropriate birthing options. As a result, our research holds implications for clinical practice, potentially leading to improved perinatal care and outcomes for this particular patient population.

CONCLUSION

Appropriate selection of patients for the trial of VBAC can help reduce the higher rate of repeat caesarean section after a previous caesarean section and increase the chances of successful vaginal birth.

AUTHORS' CONTRIBUTION

IB, SN, SR: Conceptualization of the study design, literature search, write-up, proofreading, and approval of final manuscript. YF, PH: Data collection, data analysis, data interpretation, proofreading. TM: Data collection, proofreading, approval of final manuscript.

REFERENCES

1. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The increasing trend in caesarean section rates: global, regional and national estimates: 1990-2014. PloS One 2016;11(2):e0148343.
2. Souza JP, Gülmezoglu AM, Lumbiganon P, Laopaiboon M, Carroli G, Fawole B, *et al*. Caesarean section without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004-2008 WHO Global Survey on Maternal and Perinatal Health. BMC Med 2010;8(1):71.
3. Kiwan R, Al Qahtani N. Outcome of vaginal birth after cesarean section: A retrospective comparative analysis of spontaneous versus induced labor in women with one previous cesarean section. Ann Afr Med 2018;17(3):145–50.
4. Sakiyeva KZ, Abdelazim IA, Farghali M, Zhumagulova SS, Dossimbetova MB, Sarsenbaev MS, *et al*. Outcome of the vaginal birth after cesarean section during the second birth

order in West Kazakhstan. J Family Med Prim Care 2018;7(6):1542–47.
5. Antoine C, Young BK. Cesarean section one hundred years 1920–2020: the Good, the Bad and the Ugly. J Perinat Med 2021;49(1):5–16.
6. Scheepers H, Scheepers HC, Koppes D, Koenders V, van Kuijk S. 779: National implementation of a decision aid/prediction model on practice variation, VBAC and adverse outcome. Am J Obstet Gynecol 2019;220(1):S509–10.
7. Morrison MJ, Tucker D, Holland MS. Reversing the trend of intervention: A VBAC success story. Women Birth 2022;35:29–30.
8. Foureur M, Turkmani S, Clack DC, Davis DL, Mollart L, Leiser B, *et al*. Caring for women wanting a vaginal birth after previous caesarean section: A qualitative study of the experiences of midwives and obstetricians. Women Birth 2017;30(1):3–8.
9. Alkhamis F. Pregnancy Outcome in Women with Previous One Cesarean Section, Experience from Kingdom of Saudi Arabia. Egyp J Hosp Med 2019;77(3):5109–13.
10. 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.
11. Chiniwar MA. Study of feto-maternal outcome in previous cesarean section. Int J Reprod Contracept Obstet Gynecol 2018;7(9):3848–51.
12. Tefera M, Assefa N, Teji Roba K, Gedefa L. Predictors of success of trial of labor after cesarean section: A nested case–control study at public hospitals in Eastern Ethiopia. Womens Health 2021;17:17455065211061960.
13. Trojano G, Damiani GR, Olivieri C, Villa M, Malvasi A, Alfonso R, *et al*. VBAC: antenatal predictors of success. Acta Biomed 2019;90(3):300–9.
14. 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;19(1):360.
15. Gupta S, Ganatra H. Vaginal birth after cesarean. Int J Reprod Contracept Obstet Gynecol 2019;8:2832–7.
16. Siraneh Y, Assefa F, Tesfaye M. Feto-maternal outcome of vaginal birth after cesarean and associated factors among mothers with previous cesarean scar at attat lord merry primary hospital, gurage zone, South Ethiopia. J Preg Child Health 2018;5(5):390.
17. Martin JA, Hamilton BE, Osterman MJK. Births in the United States, 2016. NCHS Data Brief 2017;287:1–8.
18. WHO. "Caesarean Section Rates Continue to Rise, amid Growing Inequalities. in Access." [Internet]. Word Health Organization. [cited 2023 July 31]. Available form: www.who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access
19. Bellows P, Shah U, Hawley L, Drexler K, Gandhi M, Sangi-Haghpeykar H, *et al*. Evaluation of outcomes associated with trial of labor after cesarean delivery after a change in clinical practice guidelines in an academic hospital. J Matern Fetal Neonatal Med 2017;30(17):2092–6.
20. Birth after previous caesarean birth (Green-Top Guideline No. 45) [Internet]. RCOG. [cited 2023 Feb18]. Available from: https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/birth-after-previous-caesarean-birth-green-top-guideline-no-45/
21. Yaaqoub NK, Tawfeek RS, Hashim E. Impact of previous cesarean section scar thickness on next pregnancy outcome-Hospital based studyin Tikrit city. Tikrit Med J 2016;21(1)194–9.
22. Singh S, Dhama V, Chaudhary R, Karya U, Nanda K. Maternal and fetal outcome in pregnant women with previous one lower segment cesarean section. Int J Reprod Contracept Obstet Gynecol 2016;5(11):3815–20.
23. Qazi Q, Akhtar Z, Khan AH. Maternal and foetal outcome in successful vaginal birth after caesarean section versus repeat caesarean section. J Postgrad Med Inst 2013;27(4):414–8.
24. O'Dwyer V, Fattah C, Farah N, Hogan J, Kennelly MM, Turner MJ. Vaginal birth after caesarean section (VBAC) and maternal obesity. Arch Dis Child Fetal Neonatal Ed 2011;96(Suppl 1):Fa75–96.
25. Mekonnen BD, Asfaw AA. Predictors of successful vaginal birth after a cesarean section in Ethiopia: a systematic review and meta-analysis. BMC Pregnancy Childbirth 2023;23(1):65.

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