# Success rate of vaginal birth after cesarean section in Kerbala maternity hospital

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**Objectives** To estimate the success rate of vaginal births after cesarean (VBAC) section and to identify its associated factors.
**Methods** A cross-sectional study of a retrospective data from Holly Karbala Maternity Hospital. In this study, 3000 case sheets were collected randomly during the period from October 2016 to August 2017. From those selected patients, 530 pregnant women with a prior lower transverse cesarean section were selected for the study. Patients with a singleton term pregnancy, vertex presentation, with no medical illnesses and opt to deliver by vaginal delivery were included. Patient's information was analyzed regarding type of labor in relation to certain factors.
**Results** A total of 347 cases were included in the research. With a mean age and SD of 30.62 ± 5.98 years. Success rate for VBAC was 73%. The predicted probability of VBAC was significantly higher in those who had a previous successful trial of labor with a success rate of 78.5% than that who did not have previous vaginal delivery 56.1%. The success rate was significantly associated with older maternal age, increase parity and lower neonatal birth weight.
**Conclusion** The VBAC had high success rate, and the choice trial of labor after cesarean should be supported and chosen whenever it is possible over the choice of conducting second cesarean section. The success rate was positively associated with history of previous vaginal labor, older maternal age, higher parity and lower neonatal birth weight.
**Keywords** vaginal birth, cesarean section, vaginal birth after cesarean section, trial of labor after cesarean, elective repeat cesarean delivery

## Introduction

Cesarean section (CS) is one of the most frequently performed daily surgical procedures worldwide. The rates of CS are increasing over last decades where cesarean deliveries accounted for nearly one-third of births in the United States in 2014. Further, these rates are not expected to decrease under current trends and guidelines for delivery.[1–4]

Previous CS is the commonest cause of increased CS rates worldwide. Further, the shifts in obstetrics field leads to reduction of vaginal breech deliveries and forceps deliveries are other reasons.[5–7]

Neither elective repeat cesarean delivery (ERCD) nor trial of labor after cesarean (TOLAC) is free of risks to mothers or newborns. These risks include postpartum hemorrhage, sepsis, procedure harm, hysterectomy, thromboembolism and death. However, vaginal birth after previous cesarean delivery (VBAC) had linked with lower rates of morbidity and mortality for both mothers and neonates.[8–11]

In addition to clinical concerns, the decision to undergo a TOLAC or an ERCD has important economic ramifications. The cost incurred by hospitals, and thus passed onto payer since the health system, is generally considered to be greater for an ERCD because of higher resource use and longer average hospital stays.[2,8,12]

Though CS can reduce maternal and perinatal mortality and morbidity, they are also attributed to short- and long-term consequences, which may prolong for years after the present labor and affect the well-being of the woman and her child as well as following pregnancies.[8,13,14]

Several models had been developed to predict a successful VBAC, Grobman et al. had designed a model, which includes simple applicable measures that could be applied soon in pregnancy at primary health care levels for most women.[15–18]

American College of Obstetricians and Gynecologists (ACOG) has recommended that most pregnant women with a single previous low transverse cesarean delivery be counseled about VBAC and should be given a trial of labor. Where giving the mothers clear information about risks and benefits for own health and her neonate well-being and share her in decision of mode of delivery is an essential issue in the counseling process and having a TOLAC.[7]

Under good quality of obstetric care, the success rate for TOLAC is between 60% and 80%, with lower rates in less developed countries reported. These rates are parallel to vaginal delivery rates in obstetrics work. The success rate of TOLAC is reported to be lower among women who had not vaginal delivery previously or those with a history of obstructed labor have fetal dangers or growth retardation underwent induction of labor, have cephalic–pelvic disproportion.[19–21]

The rates in Iraq, there is a continuous rise in the incidence of primary CS for various indications. Where the rate had increased from 18.0% in 2008 to 24.4% in 2012. While the annual statistical report for 2016 reveal a rate for CS of 33.1% in Iraq and in Kerbala it was 31.5%. Furthermore, the rate of CS from total deliveries in private hospitals in Iraq is nearly triple that in public hospitals.[22,23] The aim of this study is to determine the success rate of VBAC and to identify the factors associated with it.

## Methods

A cross-sectional study of a retrospective data from Kerbala maternity hospital. In this study, 3000 case sheets were selected randomly during the period from October 2016 to August 2017. From those patients, 530 pregnant women with a prior

lower transverse CS were selected. From those 530 women presented to the labor ward of Kerbala, maternity hospital and all women want spontaneous trial of VBAC.

Patients with a singleton term pregnancy, vertex presentation, with no medical illnesses and opt to deliver by vaginal delivery were included. Patients who scheduled to deliver by elective CS due to obstetric, medical, or any other causes were excluded. Medical records and antenatal care card were reviewed, patient at higher risk of CS due to any cause other than obstetric causes were excluded. The prediction model includes: maternal age, parity, any prior vaginal delivery, prior VBAC and fetal weight after delivery.

Ethical approvals were obtained from research ethical committee in College of Medicine, University of Kerbala, and an administrative approval obtained from the maternity hospital administration. Patient's names and personal information as well as physician information kept hidden.

The data from individual patients were entered and analyzed into to assess the predicted success rate of TOLAC for each woman. Then, the variables across the successful and failed groups were measured using Statistical package for social science (SPSS) program version 21 for IBM Company. Qualitative variables were expressed as number and percentages while quantitative variables were expressed as the mean ± standard deviation (SD). The chi-square or Student's $t$-test were used for analysis accordingly. A $P < 0.05$ was considered statistically significant.

## Results

A total of 347 cases were included in the research. With a mean age and SD of 30.62 ± 5.98 years. While the birth weight (BWT) of their children mean ± SD was 3254.48 ± 299.13 as shown in Table 1. Regarding patient's parity 195 (56.2%) had
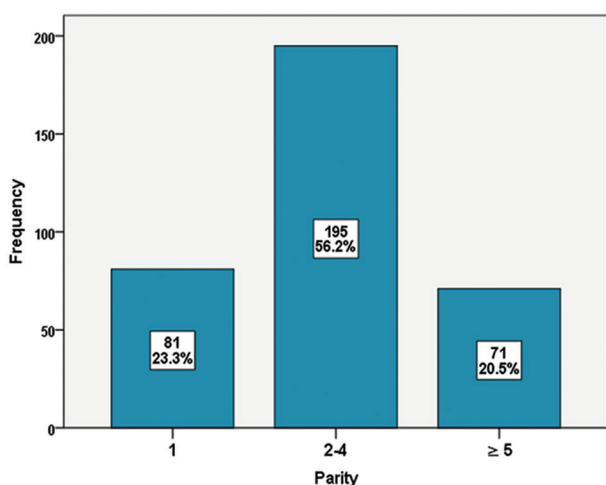
2–4 children as shown in Fig. 1. Also, 265 (76.4%) had history of previous vaginal delivery (PVD) as shown in Fig. 2.

There were 254 patients had VBAC, corresponding to a success rate of 73.2% as shown in Fig. 3. The predicted probability of VBAC was higher in those who had a previous successful trial of labor 208 patient out of the total corresponding to a success rate 78.5% than that who did not have previous vaginal delivery 56.1% $P < 0.001$.

The effect of the age on the success rate of VBAC in this study was higher in the category of age above 40 years old, 28 patient out of 29 patient above 40 years old delivered normally (96.6%), followed by the category of age between 30 and 39 years old 74.3% as shown in Table 2.

Parity effect on the success rate of VBAC was statistically significant with a $P < 0.001$, the success rate increase in a direct proportion with number of vaginal delivery, patients with more than five previous deliveries and one previous CS has a success rate equal to 83.1%, while patient delivered between two and four delivery with a history of previous single CS has success rate about 76.9%, patients those who have only one previous delivery by CS has a success rate about 55.4%.

Mean fetal bodyweight for those who delivered normally was significantly lower than those who delivered by CS, $P < 0.001$ (Table 2).

## Discussion

Primigravida lady prefers CS probably to avoid labor pain due to the fact that in our locality painless labor is not available only in some private hospitals and most of the patient delivered normally had a bad experience regarding normal delivery. Another indication that rushes the patient for CS is the patient fear from anterior or posterior vaginal wall prolapse and getting wide vagina which may cause marital problem. These patients will be difficult to convince for VBAC and when labor started they will not have the patience to continue till complete their delivery.
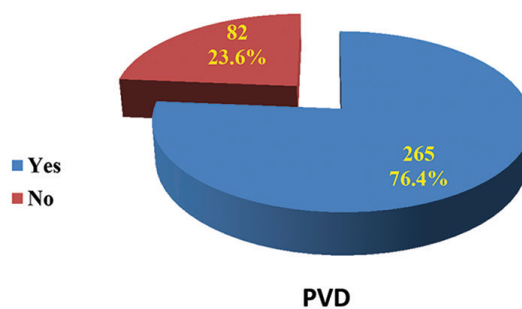
Table 1. **Age of the patients and children body weight distribution**

|      | N   | Minimum | Maximum | Mean    | SD     |
|------|-----|---------|---------|---------|--------|
| Age  | 347 | 16      | 42      | 30.62   | 5.98   |
| BWT  | 347 | 1900    | 4200    | 3254.48 | 299.13 |



Fig. 1 **Parity of patients.**



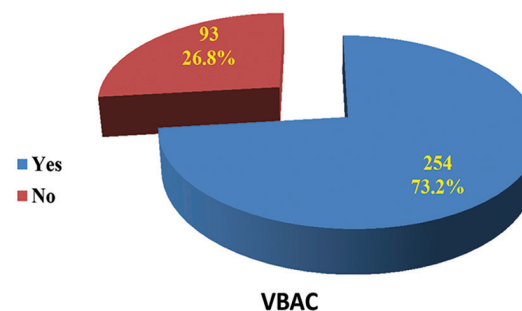Fig. 2 **Patients classification according to history of PVD.**



Fig. 3 **Success rate of vaginal delivery.**

**Table 2. Comparison of patients according to success rate of VBAC**

| | | VBAC | | Total N/% | P-value |
|---|---|---|---|---|---|
| | | Yes N/% | No N/% | | |
| PVD | Yes | 208 | 57 | 265 | |
| | | 78.5% | 21.5% | 100% | |
| | No | 46 | 36 | 82 | <0.001 |
| | | 56.1% | 43.9% | 100% | |
| Age group | <20 | 2 | 5 | 7 | |
| | | 28.6% | 71.4% | 100% | |
| | 20–29 | 100 | 44 | 144 | |
| | | 69.4% | 30.6% | 100% | |
| | 30–39 | 124 | 43 | 167 | 0.001 |
| | | 74.3% | 25.7% | 100% | |
| | ≥40 | 28 | 1 | 29 | |
| | | 96.6% | 3.4% | 100% | |
| Parity | 1 | 45 | 36 | 81 | |
| | | 55.6% | 44.4% | 100% | |
| | 2–4 | 150 | 45 | 195 | <0.001 |
| | | 76.9% | 23.1% | 100% | |
| | ≥5 | 59 | 12 | 71 | |
| | | 83.1% | 16.9% | 100% | |
| Total | | 254 | 93 | 347 | |
| | | 73.2% | 26.8% | 100% | |

**Table 3. Difference between mean children BWT and VBAC success**

| | VBAC | N | Mean | SD | P- value |
|---|---|---|---|---|---|
| BWT | No | 93 | 3433.12 | 304.07 | <0.001 |
| | Yes | 254 | 3189.07 | 269.67 | |

Further, in high-risk group patients, to avoid the risk of a scar rupture, the obstetrician being in a dilemma regarding the mode of delivery in these cases. Assessment of the individual case with regard to the possibility of a successful VBAC is necessary while taking the decision and take in the consideration the fear of scar rupture and subsequent medico-legal litigations.[24] Other factors that may affect the obstetrician decision to stop or continue delivery by vaginal route is prior stillbirth baby during labor, but the advantage which the vaginal delivery imparts largely outweighs the risks associated with a repeat CS.

The rate of successful VBAC in cases with previous normal vaginal delivery was 78.5%. Kraiem et al. reported that a previous vaginal delivery was the greatest predictor for a successful VBAC.[25]

History of prior successful vaginal delivery improves the success rate of normal vaginal delivery according to the RCOG green guideline success rate 85–90% in women with prior successful vaginal delivery.[26]

The success rate of VBAC appeared to be decreased significantly with the increase of body weight. Similar observations were made by others.[27,28] Those women with no history of a vaginal delivery should be counseled that the success rates may be <50% when the neonatal birth weight exceeds 4000 g, and that the success rates may decrease more if the indication for the previous cesarean delivery was cephalopelvic disproportion or failure to progress or if the patient requires either induction or augmentation of labor. Further, an increased risk for uterine rupture rate was reported in women with a birth weight ≥4000 g.[29]

Increasing parity was noted to be associated with an increase in VBAC rate. Grand multipara patient has a success rate as high of 83.1% and it decreased with decrease parity of patients. This is similar to study done in Turkey were most women insist on vaginal birth to be able to bear more children, resulting in large families.[30]

This study reveals that older age patients had more success rate of VBAC than those with the younger age group. While Srinivas et al. reported the opposite and that women with increase in age are less likely to attempt VBAC and more likely to have an unsuccessful labor trial. Still, it could be related to increase parity with increasing age rather than that older age increase chances for VBAC.[31.]

## Conclusion

The VBAC had high success rate, and the choice for TOLAC should be supported and chosen whenever it's possible over the choice of conducting second CS. The success rate was positively associated with maternal history of previous vaginal labor, older maternal age, higher parity and lower neonatal birth weight.

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