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Pattern of Vaginal Birth after Cesarean, its Variables and Outcome at the Interval of One Decade in Dhulikhel Hospital

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ABSTRACT

Background: There should be high index of suspicion for timely detection of any complications for safe trial of labor in case of vaginal birth after cesarean. Emergency obstetric care must be available. Even with these provisions the vaginal birth after cesarean rate is decreasing in Dhulikhel Hospital in recent years.

Methods: This retrospective study was conducted to compare different modes of delivery and pattern vaginal birth after cesarean in a gap of ten years in Dhulikhel Hospital (i.e. 2007 to 2009 versus 2017 to 2019). In this study factors associated with the successful vaginal birth after cesarean were also analyzed.

Results: A total of 4215 deliveries conducted in the year 2007 to 2009, of them 890 (21.1%) were cesarean deliveries. Likewise altogether 9298 deliveries conducted in the year 2017 to 2019, of them 2849 (30.6%) were cesarean deliveries. Vaginal birth after cesarean rate is significantly decreased from 18.33% (33/180) to 8.8% (63/713) (p value = 0.0004). Instrumental deliveries, normal vaginal deliveries were significantly decreased in comparison to these in the year 2007 to 2009. Duration of labor of vaginal birth after cesarean (7.05 ± 1.25 vs 7.13 ± 2.02 , $p=0.8362$) and mean fetal weight of vaginal birth after cesarean baby (2818.71 ± 686.37 vs 2820.79 ± 511.78 , $p=0.9867$) were not much different.

Conclusions: Over the years, vaginal birth after cesarean rate is decreased.

Keywords: Cesarean section; fetal distress; institutional delivery; obstetric care; uterine rupture

INTRODUCTION

Over the last few decades, cesarean section (CS) rates have been rising in many parts of the world, leading to a significant population of women with previous CS.¹⁻³ In the early 1980s trials of labor were quite less, currently clients considering vaginal birth after cesarean (VBAC) in subsequent pregnancies are frequently encountered.^{4,5} Any strategy aimed at reducing CS rates, and VBAC must be encouraged.⁶ Several studies confirmed the safety of VBAC.⁷⁻⁹ In Dhulikhel Hospital, VBAC is being conducted since its establishment (1996). A decade ago, a three years long study was conducted in DH on VBAC and its variables with a success VBAC rate of 18.33% (33/180).¹⁰ Over the years, it was noticed that the CS rate has been increasing in DH. Hence, this study was conducted to explore the pattern of VBAC and its variables after a gap of ten years.

METHODS

This retrospective study was conducted to compare different modes of delivery and pattern VBAC in a gap of ten years. Additional factors associated with the successful attempts of VBAC were also compared. Collected data were grouped into two (i.e. 2007 to 2009 and 2017 to 2019) for comparison.

All cases with previous one cesarean delivery but without any absolute contraindication for vaginal delivery were considered for VBAC. They were counseled on risk and benefit of VBAC and took informed consent for VBAC. These cases were monitored closely with the use of partogram and continuous cardiotocography (CTG). Appropriate instruments were used to cut short second stage of labor and cervical exploration was performed if needed. None of the VBAC cases were induced but

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postdated cases were allowed to deliver vaginally if they were presented in active phase of labor and VBAC criteria were met. All successful VBAC cases were admitted in the hospital for five days to exclude any complications.

This study was carried out in Department of Obstetrics and Gynecology reviewing all the outpatient department (OPD), inpatient and Operation Theater (OT) records. All the files and computer recordings were reviewed for this purpose. Ethical clearance was taken from the hospital research committee (IRC-KUSMS # 288/19) prior to data collection. All data were analyzed by SPSS 16 packages using rate, mean, standard deviation and Chi square test.

RESULTS

There were 4215 deliveries in the year 2007 to 2009 (Figure 1).

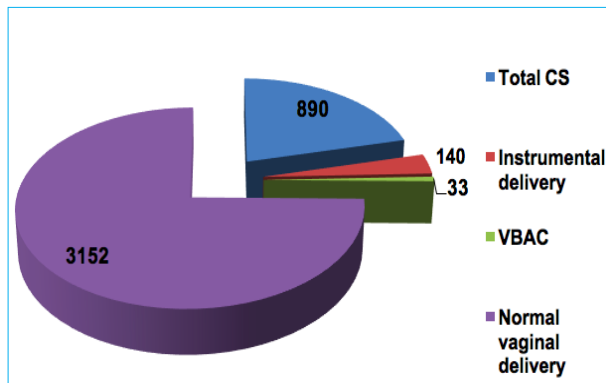


Figure 1. Different modes of delivery (2007 to 2009).

Among the 890 cesarean, there were 743 (83.5%) primary cesareans and 147 (16.5%) repeat cesareans. Over that period 180 with history of one previous caesarean were eligible for vaginal delivery, 33 women had successful VBAC.

Of 33 successful VBAC cases, there were 21 second gravida, eight third gravida and four fourth gravida. Of them, two cases were preterm, five cases were postdated and rest cases were term. And nine cases had a previous history of either one or more VBAC or vaginal birth (VB) and two had preterm deliveries (one twin pregnancy and one case with an intrauterine death due to cord prolapse).

There were 9298 deliveries in the year 2017 to 2019 (Figure 2). Among the 2849 cesarean, there were 2199 (77.2%) primary cesareans and 650 (22.8%) repeat cesareans. Over that period 713 cases with history of one previous caesarean were potential for vaginal delivery, and 63 of them had successful VBAC.

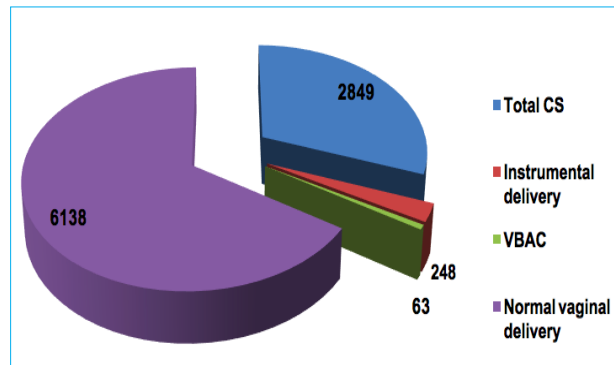


Figure 2. Different modes of delivery (2017 to 2019).

Of 63 successful VBAC cases, 39 cases were second gravida, 16 were third gravida, six were fourth gravid and each cases of fifth and sixth gravida. Of them, five cases were preterm, ten cases were postdated and rest cases were term. Nine cases had previous history of either one or more VBAC or VB while two cases had assisted vaginal breech delivery after cesarean.

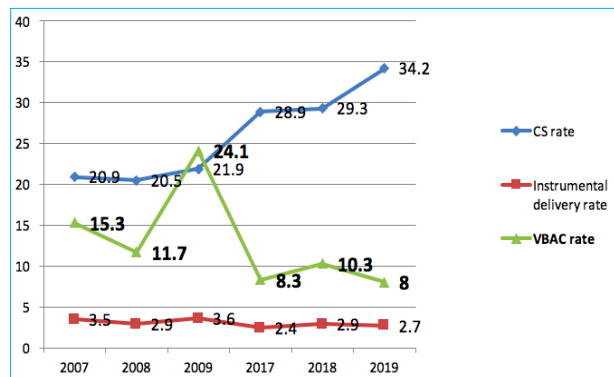


Figure 3. Rate of different deliveries other than normal vaginal delivery.



Figure 4. This figure clearly shows the previous vertical scar in the abdomen.

Indications of previous cesarean, labor information and fetal weight detail were presented in Table 1 and 2.

Table 1. Analysis of VBAC and its variables in Dhulikhel Hospital at the interval of one decade.

Year	Indication of previous cesarean	Average cervical dilatation and duration of labor	Any use of instruments	Average birth weight and maximum birth weight
2007	Fetal distress - 5 Breech - 2 NPOL - 1 APH - 1	Avg Cx dilatation ≥ 6 cm Avg duration of labor - 7.40 hrs	No use of instruments - 4 Forceps - 4 Vacuum - 1	Avg birth wt - 2978.63±693.56 gram Max birth wt - 4250 gram
2008	Breech - 4 TL - 1 Oligohydramnios - 1 Fetal distress - 1	Avg Cx dilatation ≥ 5 cm Avg duration of labor - 6.33 hrs	No use of instruments - 5 Vacuum - 2	Avg birth wt - 2701.46±818.62 gram Max birth wt - 3770 gram
2009	Fetal distress - 8 Breech - 4 APH - 3 PIH - 1 Oligohydramnios - 1	Avg Cx dilatation ≥ 5 cm Avg duration of labor - 7.01 hrs	No use of instruments - 6 Vacuum - 7 Forceps - 1	Avg birth wt - 2776.05±546.92 gram Max birth wt - 3900 gram
2017	Breech - 3 Fetal distress - 9 Non progress of labor - 1 APH - 2 Failed induction - 2 PIH - 1 Oligohydramnios - 1	Avg Cx dilatation ≥ 4 cm Avg duration of labor - 6.30 hrs	No use of instruments - 11 Vacuum - 8	Avg birth wt - 2770.53±471.34 gram Max birth wt - 3600 gram
2018	Breech - 4 Fetal distress - 7 Non progress of labor - 3 APH - 4 PIH - 3 TL - 2 Oligohydramnios - 1	Avg Cx dilatation ≥ 6 cm Avg duration of labor - 7.45 hrs	No use of instruments - 20 Vacuum - 4	Avg birth wt - 2728.96±585.39 gram Max birth wt - 3790 gram
2019	Breech - 2 Fetal distress - 6 Non progress of labor - 3 APH - 2 Failed induction - 4 PIH - 2 TL - 1	Avg Cx dilatation ≥ 5 cm Avg duration of labor - 7.25 hrs	No use of instruments - 18 Vacuum - 2	Avg birth wt - 2978.75±435.81 gram Max birth wt - 3900 gram

Table 2. Comparison of different modes of delivery and other variables at the interval of one decade.

	Former period (2007 - 2009)	Latest period (2017 - 2019)	p value
VBAC	33	63	0.0004
Instrumental delivery	140	248	0.0400
Total CS	890	2849	0.0001
Total normal vaginal delivery	3152	6138	0.0001
Duration of labor of VBAC (hours)	7.05±1.25	7.13±2.02	0.8362
Mean fetal weight of VBAC baby (gram)	2818.71 ±686.37	2820.79 ±511.78	0.9867

Duration of labor of VBAC cases and mean fetal weight of VBAC babies were not much different but VBAC, instrumental deliveries, and normal vaginal deliveries were significantly decreased and cesarean rate is increased in the year 2017 to 2019. There were very few maternal and fetal complications noticed in VBAC deliveries in latest period as well. Each case of primary postpartum hemorrhage and third degree perineal tear were encountered. Likewise one case of pulmonary hemorrhage and two premature newborns shifted to neonatal intensive care unit (NICU). All of them were recovered and discharged from hospital.

DISCUSSION

In 1999, the American College of Obstetricians and Gynecologists (ACOG) advocated a policy that surgical capability be “immediately available” for women in

labor attempting VBAC.¹¹

Cesarean rate is increased from 21.1% to 30.6% over the years in Dhulikhel hospital. Being tertiary care hospital, significant numbers of cases were referred from periphery or neighboring districts for emergency obstetric care contributing to increment in cesarean delivery rate. According to Nepal demographic health survey (2006), institutional delivery practices increased from 35 to 57% in Nepal with highest institutional deliveries (i.e. 71%) in Bagmati Province. Paradoxically CS rate is being increased with increment in institutional delivery practices, probably referring complicated cases at last moment, where CS would be the last option.

The success rates for VBAC when all indications for the primary operation are considered, is up to 75%.^{8,9,12} In Dhulikhel hospital 33 (18.3%) and 63 (8.8%) women had successful VBAC in former and latest period respectively with significant reduction in VBAC rate. There were two potential reasons for this VBAC rate reduction. First, even after vigorous counseling if the pregnant lady and/or her family members opt for repeat cesarean, we won't have second option. In recent years, this was being increased after certain CS/delivery mishap news in Nepal. Secondly, since last four years scar thickness is being measured at term in a lady with previous CS in Dhulikhel hospital. And cesarean were repeated in those lady with scar thickness of 2.5 mm or less. A prospective study related to difference in sonographic and intra-operative findings of scar thickness and maternal & fetal outcomes is going on in DH.

And we repeated cesarean on significant numbers of planned VBAC cases for complaints of scar tenderness at the time of presentation; although almost all of them didn't have any scar dehiscence or rupture preoperatively except thinned lower uterine segment in very few cases.

Though the risk of uterine rupture is approximately 1% with a low transverse uterine incision, it is important to have a high index of suspicion such that detection of uterine rupture is not delayed and early detection in order to make trial of labor safer and improve maternal and fetal outcome. Large studies looking at prostaglandin gel¹³, and oxytocin¹⁴, have indicated that they are safe to use in women with a previous cesarean section. Oxytocin was selectively used for augmentation purpose in several cases in this period too. None of VBAC cases were induced and those with post-datism were electively posted for repeat cesarean.

It is reported that the VBAC success rate can rise

incrementally from 63.3 to 91.6% in patients that had from zero to four or more prior successful VBACs. Neonatal morbidity did not increase with increasing VBAC number.¹⁵ Eleven and nine cases had a previous history of either one or more VBAC or VB in former and latest period respectively. In patients with a prior vaginal delivery; VBAC appears to be safer from the maternal standpoint than repeat caesarean.¹⁶ There were very few maternal and fetal complications noticed in VBAC deliveries in latest period as well. Each case of primary postpartum hemorrhage and third degree perineal tear were encountered. One case of pulmonary hemorrhage and two premature newborns shifted to NICU. All of them were recovered and discharged from hospital.

Women with no prior history of vaginal delivery are considered less favorable, the VBAC success rate may be even lower if the indication for previous primary cesarean delivery was failure to progress, and may be associated with increased risk of uterine rupture.¹⁷ Previous CS for suspected CPD, dystocia or failure to progress in labor are associated with lowest chance of subsequent successful trial of vaginal delivery.^{6,18} Though the other indications for previous cesarean were not much different in these periods, NPOL (seven cases) and failed induction (six cases) were the indications for previous cesarean section in the latest period (Table 1).

In a review of 102 women with one previous lower uterine segment caesarean section showed a successful vaginal delivery rate of 72.5%. The cervical dilatation rate, average cervical dilatation rate and the alert line were found to be significant predictors of the outcome of labor in VBAC.¹⁹ Duration of labor of VBAC in these period was not much different (7.05 ± 1.25 vs 7.13 ± 2.02 , $p=0.8362$) (Table 2).

Women with cesarean for non-recurrent indications who achieved a cervical dilatation ≥ 8 cm may be the best candidates for VBAC, with the greatest likelihood of a successful VBAC. Among 1148 enrolled women, 956 (83.3%) achieved a successful VBAC. Birth weight, previous indication for cesarean delivery and oxytocin augmentation were significantly associated with VBAC outcome.²⁰ In both periods, cases with previous one cesarean delivery who subsequently progressed to successful VBAC were presented in the active stage of labour (ranged ≥ 4 to ≥ 6 cm) and delivered within expected time period (Table 1).

Decisions around the next birth after CS are complex. Efforts to keep the first birth normal and support women who have had a CS to have a vaginal birth need to be made. More research to predict which women are likely

to achieve a successful VBAC and the most effective ways to facilitate a VBAC is essential.

CONCLUSIONS

We conclude that cesarean rate is increased and VBAC rate is decreased over the years.

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