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Successful vaginal birth after caesarian section and maternal outcome

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Abstract
Objective: Our purpose was to determine the maternal risks associated with failed attempt at vaginal birth after cesarean compared with elective repeat cesarean delivery or successful vaginal birth after cesarean.
Study Design: its prospective study done in Al-Zahra Teaching Hospital in Najaf city from December 2010 to October 2011. The following three groups were defined: women who had successful vaginal birth after cesarean, women who had failed vaginal birth after cesarean and women who underwent elective repeat cesarean. Predictor variables included age, parity, reasons for repeat cesarean delivery, gestational age. Outcome variables included uterine rupture or dehiscence, hemorrhage, need for transfusion, The Student t test and the x^2 test were used to compare categorical variables and means; maternal complications and factors associated with successful vaginal birth after cesarean were analyzed with multivariate logistic regression, allowing odds ratios, adjusted odds ratios, 95% confidence intervals, and P values to be calculated.
Results: A total of 226 patients were delivered during the study period, which had previously cesarean delivery. Repeat cesarean deliveries were performed in 168 (74.3%) women and 58 (25.6%) successful vaginal births after cesarean delivery occurred. Vaginal birth after cesarean was attempted by 113 patients or 50% of all appropriate candidates. Vaginal birth after cesarean was successful in 58 women (25.6%) and unsuccessful in 55(24.3%) women. Multiple gestations were excluded from analysis. The rate of scar dehiscence was (3.5%) of all women attempting labor; the rate of true rupture was 0.8%; and there was no hysterectomy and postpartum heamorrhege was 5 women (4.4%), women who experienced failed vaginal births after cesarean had a rate of uterine rupture that was 0.8%, a rate of transfusion that was 9 %, postpartum heamorrhege was (9%)

Keywords: Vaginal**,** birth**,** cesarean

Introduction
Before the 1970s, deliveries by cesarean section were considered as indication for cesarean section in the subsequent pregnancies, reflecting a concern that uterine scar tissue might rupture during labor [1]. In the 1980s, the dictum once a cesarean, always a cesarean," espoused by Craigin in 1916 [2], was revised in many countries and a trial of labor in women with history of cesarean section was proposed as an attempt to reduce cesarean section rates* However, an apparent increase in the incidence of uterine rupture and concern about maternal and fetal safety have challenged the choice of vaginal delivery in women having a scarred uterus [3]. As a consequence, clinicians are increasingly being faced in deciding the mode of delivery in pregnant women whose first delivery was by cesarean section a meta-analysis of articles published in the period 1982-1989 failed to identify advantages for elective repeat cesarean delivery, compared with trial of labor, with regard to uterine rupture and perinatal death [4]. In contrast, a meta-analysis of subsequent investigations published from 1989 to 1999 reported a higher rate of uterine rupture and perinatal death following a trial of labor than following elective cesarean section [5] Concerns about immediate maternal complications associated with uterine rupture [6] have contributed to a decrease in vaginal birth after caesarean section (VBAC) rates and the recent rise of caesarean deliveries in developed countries [7] The decline of VBAC rates, with its subsequent rise in caesarean section rates is not without clinical implications Considering the immediate risk of uterine rupture with VBAC and the later risk of placenta accreta with multiple repeat caesarean sections what is the best decision for women who have undergone a single low transverse caesarean section? Randomized controlled trials are not available and are unlikely to be conducted. Moreover, previously published observational studies do not specifically address the downstream consequences of a strategy of

multiple repeat caesarean sections for women with a prior caesarean section delivery. Therefore, a decision analysis was designed to evaluate and compare the immediate and downstream maternal morbidity of both a trial of labour and an elective repeat caesarean section for women with one prior low transverse caesarean section [8-10]. Caesarean section is one of the frequently performed surgical procedures in current obstetrics (Skoczynski *et al*., 2004) [11]. The caesarean section rate has increased to an alarming extent in the last decades (Skoczynski *et al*., 2004; McDorman *et al*., 2005) [12]. Repeat caesarean section is the single most common contributor to this rise or high incidence of caesarean section (National Center for Health statistic, 1991) [13]. Trial of vaginal birth after caesarean section (VBAC) represents one of the most significant changes in obstetric practice in the recent time Because of the trial of VBAC [14], it is now advocated that women without contraindications to vaginal delivery but with one previous lower segment caesarean section should be offered trial of vaginal birth after caesarean section (SOGC 2005) [14]. Induction/augmentation of labour are not absolutely contraindicated in trial of VBAC (SOGC 2005; McDonagh *et al*., 2005) [15]**.** However, women with history of previous caesarean section who require induction/augmentation have a higher rate of repeat caesarean section compared with similar women with spontaneous labour (McDonagh *et al*., 2005; Udoma *et al*., 2005) [15]. A dramatic rise in caesarean deliveries have been occurring over the past three decades the old myth "once a caesarean always a caesarean" is no longer acceptable Hence there is a change world over leading to on increased practice of attempting vaginal birth after caesarean delivery as compared to repeat elective caesarean delivery include lower rates of postpartum fever, wound infections, maternal discomfort length of hospital stay need of blood transfusion and lower rates of hysterectomy [16]**.** A successful vaginal birth with previous one caesarean section includes several factors. Out of these, favorable mortality, bishop's score, BMI < 20, prior vaginal delivery wt of baby < 3.5 kg and non-recurrent indication for previous section are the most common [17]. Maternal age also plays an important role and age less than 40 years is considered to be a favorable factor [18]. However, trial of labour is associated with a greater risk of uterine rupture and hence increased incidence of perinatal death[19]. In Pakistan, large scale data is lacking on safety and outcome of trial of labour. Two retrospective studies our country suggest success as high as 70- 80% of trial of labour in patients with favorable parameters [20]. Hence this study was conducted in order to be able to predict about the patients who are likely to have successful VBAC and hence reducing the fetomaternal mortality. Another benefit of this study was that It will promote vaginal birth in patients with previous caesarean section and hence reducing complications associated with caesarean section Successful VBAC included patients attempting a trial of labor and succeeding in vaginal delivery. Failed VBAC occurred in patients who were deemed appropriate for trial of labor and who attempted vaginal delivery but, for whatever reason, ended with a repeat cesarean. The elective repeat cesarean group was defined as women who were deemed inappropriate for trial of labor for whatever reason and who were elected to undergo surgical delivery. These criteria were established as reasonable by the clinical maternal-fetal medicine specialists at the University of Chicago and were also within The American College of Obstetricians and Gynecologists guidelines for VBAC candidate.

Aim of Study

To determine the maternal risks associated with failed attempt at vaginal birth after cesarean compared with elective repeat cesarean delivery or successful vaginal birth after cesarean

Patients and methods

The study period over 11 months from December 2010 to October 2011 in Al-Zahra Teaching Hospital in Najaf city. The study include 226 patients, of them 113 patients attempting VBAC while 113 patients undergoing repeated cesarean delivery. Medical record charts were obtained and reviewed in detail for data including labor records, operative reports, and discharge summaries. Predictor variables included age, parity, gestational age at delivery. Data regarding fetal presentation, and number of previous vaginal deliveries were recorded. Similar information was collected on those patients undergoing elective repeated cesarean delivery; information on the indication for repeat cesarean and operative complications was also collected. Outcome data on maternal morbidity included blood loss, scare dehiscence or uterine rupture, hysterectomy and number of hospital days^ Initial comparison was made between ^Aiwomen attempting VBAC and women undergoing elective repeat cesarean delivery. Three groups were defined including successful VBAC, failed VBAC resulting in non-elective cesarean, and elective repeat cesarean delivery. The statistical analyses were performed with commercially available software (SPSS version 18). One way ANOVA test and Chi squared (X^2) were used to assessed significant differences between groups. P-value <0.05and <0.01 were considered to have statistically significant and highly significant at 1% and 5% respectively.

Results

During the study period, 226 patients were included in the study in Al Zahr teaching Hospital in Najaf city, all women had previous caesarian section. Repeat cesarean deliveries were performed in 168 women (74.3%), while Successful VBAC was achieved in 58 patients, (25.6 %). The C.S done as non-elective operation in 55(24.3%) patients who were discovered to have a failed attempted VBAC. However the remaining 113patients who underwent elective repeated cesarean delivery were not considered appropriate for a trial of labourfor different reasons like fetal presentation, contracted elvis. The age of pregnant women, gestational age, parity, type of fetal presentation, timing of previous C.S and number of previous C.S shown in table (1) which revealed on the basis of these final numbers, the overall attempted VBAC rate in those eligible was (50%) 113/226), and the overall success rate in those undergoing a trial of attempted VBAC was 51.3% (58/113).

Table 1: Base line characteristics of studied patients, data represented as mean ± SD.

Groups	Elective CS (n=113)	Failed VBAC (n=55)	Successful VBAC (n=58)	P value
Age (Yrs) A	26.54 (±4.952)	26.63(±4.283)	27.53 (±4.248)	0.396 NS
Parity B				
1-2	102 (90.27%)	54 (98.18%)	36 (62.07%)	0.000 **
3	6(5.31%)	0(0.0%)	14 (24.14%)	
≥4	5(4.42%)	1(1.82%)	8(13.79%)	
No. of previous VD B				
0	90(79.65%)	51(92.73%)	28(48.28%)	0.000 **
1	11(9.74%)	3(5.45%)	8(13.79%)	
2	7(6.19%)	0(0.0%)	14(24.14%)	
≥3	5(4.42%)	1(1.82%)	8(13.79%)	

A** Significant differences at P≤ 0.001, NS not significant, one way ANOVA test, B** Significant differences at P≤ 0.001, X^2 Test.

- No significant differences were observed in the age of patients of three studied groups.
- The three studied groups showed a dominant of 1-2 parity, however there are significant differences between subgroups of parity (fig.1).
- Patient who didn't have vaginal delivery was the dominant. Subgroup in comparison with other subgroups in all studied groups of patient, but there are significant differences, since failed VBAC group showed higher percent in comparison with the other two groups.

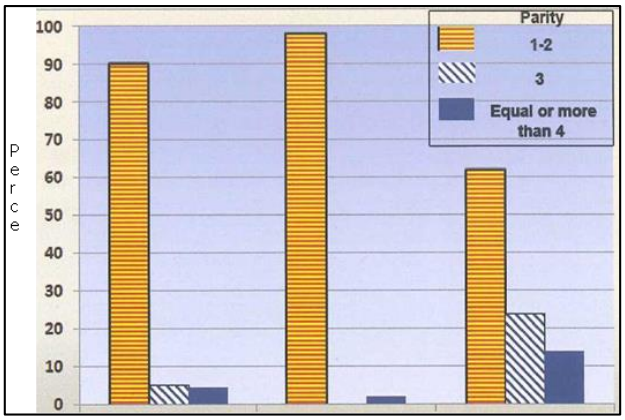

Fig 1: comparison of parity percentage in the studied groups

Table 2: Comparison of three studied groups In regard to G.A.

Gestational Age (Weeks)	Elective CS(113)	Failed VBAC(55)	Successful VBAC (58)	P value
36wks	2(1.77%)	1(1.81%)	1(1.72%)	
37wks	15(13.27%)	8(14.55%)	8(13.79%)	
38wks	39(34.51%)	28(50.91%)	26(44.83%)	0.000**
39wks	23(20.36%)	16(29.09%)	18(31.03%)	
40wks	34(30.09%)	2(3.64%)	5(8.62%)	

Significant differences (P<0.01) were observed in Gestational Age (Weeks) of three studied groups, however women with G.A. of 38 weeks were the most dominant groups (fig.2)

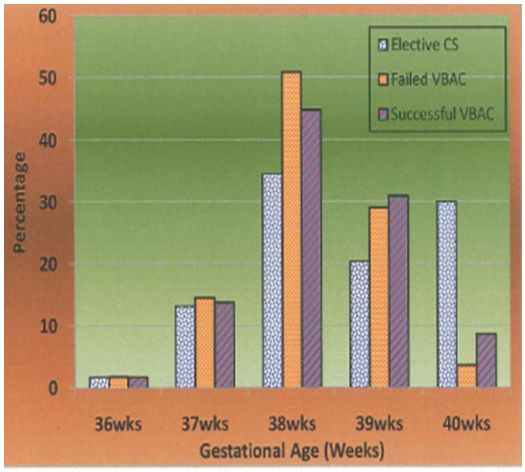

Fig 2: Comparison of three studied groups in regard to G.A.

Table 3: Comparison of three studied groups in regard to Time of previous C/S.

Time of previous C/S	Elective CS(113)	Failed VBAC(55)	Successful VBAC (58)	P value
<1 year	20(17.71%	18(32.73%)	5(8.62%)	
2yrs	39(34.51%)	14(25.45%)	8(13.79%)	
3yrs	39(34.51%)	12(21.82%)	17(29.31%)	0.000**
>4yrs	15(13.27%)	11(20.0%	30(51.72%)	

Significant differences (P<0.01) were observed in Time of previous C/S of three studied groups (fig.3)

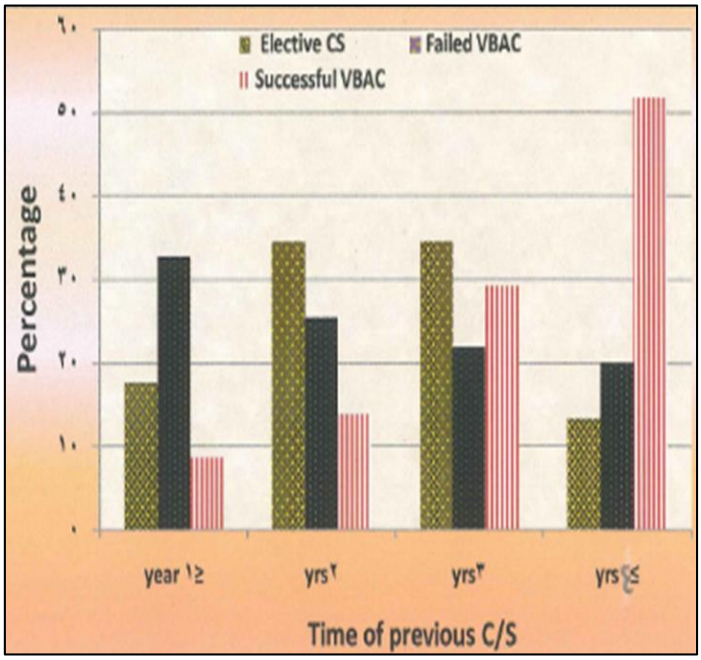

Fig 3: comparison of three studied groups in regard to Time of previous C/S

Table 4: Maternal outcome of studied groups.

Maternal outcome	Elective CS	Failed VBAC	Successful VBAC
Uterine dehiscence	0	4	0
Uterine rupture	0	1	0
Hysterectomy	0	0	0
Hemorrhage	4	5	0
Blood	Transfusion	4(2 paint)	5(2-4 paint)
Length of hospital stay (hrs)	55.43 (± 16.994)	56.84(±25.208)	4.52(±5.921)**

** Significant differences at P≤0.001.

Women delivered by successful VBAC have god shorter period of hospital stay (P<0.01) than other two groups.

Discussion

This 11 months review of VBAC and elective repeat cesarean has documented that the active encouragement of VBAC at a tertiary institution can result in 50% of all eligible candidates attempting a vaginal birth, with success rates in achieving vaginal delivery nearly 51.32%, which is not comparable with normal success rates in the United States [21]. Maternal morbidity and perinatal morbidity and mortality associated with VBAC are the issues around which controversy flares and are certainly associated with the reversal in cesarean and VBAC trends [7]. Our comparison of women attempting VBAC with women undergoing elective cesarean delivery verifies that the former have a uterine rupture rate of 0.88%; this rate, although approaching statistical significance, is within the accepted standards in this country [21]. However, the current focus of interest is that group of patients who experience failed VBAC. Thus we did further analysis comparing the failed VBAC group with the elective repeat cesarean group, as well as with the successful VBAC group. In this comparison we have demonstrated that the failed VBAC group indeed has an increased rate of uterine disruption over the rates in both latter groups, however the failed VBAC group not complicated by hysterectomy. However, the actual percentages for these results are quite low (0.8% and 0.5%, respectively, of all VBACs), and the actual number of women with these outcomes is small. No maternal deaths occurred in association with VBAC or repeat cesarean delivery in our population over this 11 months period. This outcome is similar to those recorded by Flamm *et al* [4] and Rosen *et al* [10]. however, death is such a rare event that a much larger study population would be required to assess this grave outcome. Since the 1980s numerous studies have supported the safety and success of VBAC, helping to halt the upward trend in cesarean rates [1,3, 4, 10]. In addition to active management of labor, peer review, external version, and appropriate vaginal breech delivery, a key element in achieving such a plan requires the incorporation of VBAC into the routine management of patients with previous cesarean delivery [1, 2]. Low uterine rupture rates (<1%) are

directly correlated with the type and number of previous uterine incisions [3]. Even m the event of uterine rupture, Leung *et al* " have demonstrated low maternal and neonatal complication rates if there is a prompt (<18 minutes) response. The ideal prospective, randomized trial of mode of delivery for women with a previously scarred uterus has not been performed, nor is it likely to be done in the future given the amount of data already published, the medico legal climate, and information available in the lay press. Thus information on risks and benefits regarding VBAC are derived from observational series and case reports. Beneficial results of successful VBAC have included fewer postpartum blood transfusions, shorter hospitalizations [1, 4, 10]. Flamm *et al* [4], in a prospective observational study, demonstrated a 0.7% uterine rupture rate, and no uterine rupture-related maternal or perinatal death in the VBAC patients, whereas the repeat cesarean delivery patients had increased transfusion, and hospital stay. Similarly, the current work has demonstrated a low risk of uterine rupture (0.8%), blood loss, and blood transfusion in the VBAC group. Unlike the aforementioned studies, however, we also compared women who completed successful VBAC with women who experienced failed VBAC, documenting that greater morbidities are concentrated in the latter group, as would be expected. Recently, several authors have questioned the previously quoted low risks associated with VBAC, suggesting that failed attempts at VBAC have actually resulted in greater complications and costs [9, 24]. In a retrospective observational comparison of VBAC and elective repeat cesarean delivery, McMahon *et al* [25] demonstrated a 2-fold increase in major morbidity in the VBAC group compared with the elective repeat cesarean group and also commented on two uterine rupture-related perinatal deaths. However, major morbidity also included extension of the uterine incision laterally to the uterine arteries, which most obstetricians would not consider major morbidity if recognized and repaired-Increased uterine rupture rates have been observed in Massachusetts, Pennsylvania, New York, and Florida, but it is by implication only that these increases are associated with rising VBAC rates [9]. Similar to observations documented by McMahon *et al* [24], the current study found higher risk for morbidities, including uterine rupture, hemorrhage, in the failed VBAC group compared with those successfully completing vaginal delivery or elective repeat cesarean delivery. For our elective repeat cesarean group, we attempted to select only those patients who would be considered ideal candidates for a trial of labor. We also assumed that those patients choosing to attempt VBAC were also considered ideal candidates for this route by their physicians, although in truth this may not always be the case. Although we have demonstrated increased risks associated with failed VBAC, caution should be exercised in interpreting these results. The absolute numbers of major morbidities are still, overall, very low. Addressing safety factors in future research may provide for safer, risk free VBACs. For example, in addition to type of previous incision and number of previous uterine scars, factors that have been associated with uterine rupture include the following: use of oxytocin for induction of labor, use of misoprostol for cervical ripening, and the presence of miillerian duct anomalies[24]. Similarly, by targeting predictive factors for success, we can assure that more women are in the successful VBAC category, thereby decreasing risks associated with failure. Such factors as maternal body habitus, labor characteristics, use of oxytocin for induction of labor and epidural have all been identified as potentially important in predicting failed VBAC [25] We have identified that maternal age not affect the successes rate, and increasing multiparity in association with previous vaginal deliveries were most highly associated with successful outcomes in our patients attempting VBAC. By addressing these specific factors in prospective research trials and by continuing to search for additional predictors, safer protocols for VBAC trial of labor can be defined. We urge the continuation of VBAC as an integral part of good obstetric care. Women should be allowed to make an informed choice, and more information regarding safety and prediction for success should be pursued.

Conclusion

Patients who experience failed vaginal birth after cesarean have higher risks of uterine disruption compared with patients who have successful vaginal birth after cesarean or elective repeat cesarean delivery. Because actual numbers of morbid events are small, caution should be exercised in interpreting results and counseling patients. More accurate prediction for safe, successful vaginal birth after cesarean delivery is needed.

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