A retrospective study about the outcome of vaginal delivery after cesarean section in Madinah, Saudi Arabia

Fwazia Ahmed Habib1*, Raneem Ahmed Faidh2, Sarah Mohammed Althagafi Aljohani2, Thawab Abdulawahhab Al-Kayyal2, Burooj Ahmed Abuessa2

ABSTRACT

Background: Recent trends in cesarean section (CS) have led to worldwide concern because of their steady increase and risks of maternal complications. This study aimed to assess the success rate and safety of vaginal delivery after CS in cases of a previous CS.

Methodology: This was a retrospective observational study performed at Maternity and Children Hospital at Madinah, Saudi Arabia, in 2016–2017, among 120 women who underwent a previous CS.

Results: In the present study, 93% of cases had a successful vaginal delivery after CS and 7% underwent a repeated CS for a failed trial of vaginal delivery. Women with parity <3 had a good chance of vaginal delivery than women with parity >4. Birth weight of more than 3.5 kg was associated with a lower success rate of vaginal delivery. However, 94% of the cases were delivered vaginally after the CS without postpartum complications, and there was no neonatal or maternal mortality.

Conclusion: Women with the history of a previous CS were considered more favorable for vaginal delivery. The study showed the high success of vaginal birth after CS and fewer maternal and neonatal complications.

Keywords: Cesarean section, intrauterine growth restriction, lower segment cesarean section, vaginal birth after cesarean, vaginal delivery.

Introduction

Vaginal birth after cesarean section (VBAC) is one of the challenges advanced to reduce the high numbers of cesarean sections (CSs) cases [1]. CS has the highest prevalence of major surgical intervention in various portions of the world [2]. Previous CS delivery is one of the most important factors of an increasing rate of a repeated CS [3]. CS is one of the most commonly carried out surgical procedures in Saudi Arabia. Difficult vaginal delivery and previous CS are the most common indications for CS in Saudi Arabia [4].

Women with first CS and who did not have any indications for CS in the present pregnancy should be undergoing VBAC [5]. High gravity was a significant predictor of adverse maternal outcomes [6]. The increase in CS rate was of concern because of the effects on subsequent pregnancies and deliveries and the associated higher morbidity and mortality [7]. The National Institutes of Health consensus conference in 1980 settled the VBAC as a tool to minimize CS rate [8]. The prevalence of CS was increasing in the developed countries around the world, about 23.3% in Australia, 23% in Northern Ireland, and 21.3% of all births in the United Kingdom [9]. In Saudi Arabia, the rate of CS was 19%–25% and more than 50% of the women with previous CS underwent a repeated elective CS [6].

There were many studies which showed the effectiveness of VBAC, the prospective observational study was published in India from January 2010 to December 2011, reported that the successful VBAC were 85% of cases and around 15% of cases underwent a repeated emergency CS for a failed trial of VD [10]. It also proved that the success rate of VD after a previous CS, done for indications like borderline cephalopelvic disproportion.
or non-progress of labor, was in the range of 60%–70%, whereas the success rate of VBAC for non-recurrent indications, such as premature rupture of membranes, mal-presentation, fetal distress, pre-eclampsia, and post-term pregnancy was 80%–90%. Also, it was observed that 90% of a successful VBAC was in women with a previous VD and 77% was in women with no previous VD [10]. A retrospective case-control study conducted at King Abdulaziz Hospital, Jeddah, Saudi Arabia, in January 1999 and December 2002, showed another rate of VBAC for women who did not have a history of previous vaginal delivery which was 61% [11]. CS increased the rate of maternal and fetal complications like infections, thromboembolism, placenta previa, and placenta accrete, percreta, and increta, abdominal organ injuries, and neonatal respiratory complications [12]. As the primary CS increased in rates, the antenatal care of pregnant mothers reported higher rates of history of CS which increased women in the high-risk group who had a risk of uterine rupture [10]. Thus, the study aimed to assess the success rate of VBAC and to determine the safety and success rate of VD after a previous CS.

**Subjects and Methods**

This was a retrospective observational study conducted at Madinah, Saudi Arabia in February 2016–December 2017. The study group included 120 women who had a vaginal delivery after a previous CS. Data were reviewed from the obstetric data from medical records at The Obstetrics and Gynecology Department of Maternity and Children Hospital in Madinah. Data were collected for the following variables including gravity, parity, gestational age, weight, height, maternal age, previous vaginal birth, the indication for previous CS, maternal, and perinatal outcome.

Cases with previous inverted T-shaped incision on the uterus or classical, with other uterine scars, previous two or more Lower segment Cesarean sections, history of scar dehiscence or previous rupture of the uterus or contraindications to vaginal delivery like cephalopelvic disproportion, breech presentation, estimated fetal weight > 3.5 kg, major degree placenta previa, and transverse lie, and those having other medical diseases like pregnancy-induced hypertension, anemia (Hb <10 g/dl), diabetes, renal disease, heart disease, or obstetrical complications were excluded from the study.

Data were collected using records form designed in English language, which included socio-demographic data (age, weight, and height), obstetrics history (parity, gestational week, infant and birth weight), indication of previous CS, labor (induction of labor, spontaneous), and postpartum complications [postpartum hemorrhage (PPH), uterine rupture, infection, and retained placenta]. After filling the form, participants’ weight, height, and body mass index were measured and added to the data collection form. Body mass index (BMI) was calculated using the weight in kilograms divided by square of the height in meters (kg/m²). A value of BMI < 18.5 kg/m² was considered as underweight, 18.5–24.9 kg/m² was considered as normal weight, 25.0–29.9 kg/m² was considered as pre-obese (overweight), and BMI >30 was considered as obese [13]. The data were collected individually in a structured proforma and were analyzed using the SPSS software version 16. All the data were expressed as values in the form of percentages and proportions. The outcome measured the success rate of VBAC, the predictive factors successful delivery, and all associated factors.

**Results**

This study was conducted on 120 women who had a vaginal delivery after CS. Almost, 49.2% of these women were aged 26–35 years, 22.5% were aged 17–25 years, 20% were aged 36–40 years, and 8.3% were aged above 40 years. About, 112 women (93.3%) who had CS delivered vaginally, whereas eight women (6.7%) required repeated CS. It was found that 84% of women who delivered vaginally were spontaneous delivery but 16% were induced (Figure 1).

It was observed that four women went to preterm labor at 34th gestational week, 19 women were induced between 38 and 42 weeks, while 97 women went to spontaneous labor between 37 and 42 gestational weeks. It was observed that induction of labor was more common in repeated CS group. The interval between the present pregnancy and previous CS was more than 2 years in 103 women (85.8%; Table 1).

The most common indication for CS was fetal distress which accounts for 30% and the least common indication was malformation 2.5%. It was also observed that high

<table>
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<th>Years</th>
<th>Frequency</th>
<th>Percentage (%)</th>
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<tr>
<td>&gt;2</td>
<td>103</td>
<td>85.8</td>
</tr>
<tr>
<td>&lt;2</td>
<td>17</td>
<td>14.2</td>
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<tr>
<td>Total</td>
<td>120</td>
<td>100</td>
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**Table 1. The interval between the present pregnancy and previous CS.**

![Figure 1. Type of labor followed by a CS.](image-url)
birth weight (>3.5 kg) was associated with a lower success rate of VBAC (Figure 2).

It was also observed that 78% of the participants had no postpartum complications in the vaginally delivered women (Figure 3). A mother BMI of more than 40 was associated with a minimum success rate of VBAC (5.8%) compared to women with normal BMI (40%) (Table 2).

It was observed that women with parity <3 have a good chance of vaginal delivery than women with parity >4 (Figure 4).

**Discussion**

It is commonly accepted that vaginal delivery was associated with lower fetal and maternal morbidity and mortality. VBAC offered high rates of labor safety unlike a repeated CS, because of the significant rise of CS incidence for different indications in Saudi Arabia, an increased proportion of women come to the hospital with a history of previous CS. Previous CS was the most frequent indication for CS [14]. According to the World Health Organization, the CS rate should be kept at 10%–15% of all deliveries to preserve advantageous maternal and perinatal outcomes. The present study was undertaken to determine the outcome and to assess the success rate and safety of VBAC.

This study showed that the success rate of VBAC was high 93%. Comparing this result with the results of other studies published by Riva and Teich reported the same results [15]. The highest figure of cases in the present study related to the age group of 26–35 years as compared to other age groups. Other studies showed a similar age group, expressing most of the women with the child-bearing age [14]. The highest fertility rates in the world are found in the Saudi population. Multiparity, grand-multiparity, and above were seen frequently in Saudi populations, with 12 children in a family not being uncommon [16].

A study conducted at the University of Pennsylvania Health System from 1995 to 2000, showed that a higher success rate of VBAC in preterm patients when compared with term patients underwent a VBAC and it also had lower uterine rupture rates [17]. More recent studies among women delivered at term with one previous CS, fetal age at delivery was not found to be a sustainable risk factor for the trial of VBAC success or uterine rupture, it correlates with the present study which showed similar results [18]. Similar to previous reports in the obstetrics population, the present study showed no difference in the impact of birth weight and was considered not a useful predictor of VBAC failure [19].

Another study showed the rate of uterine rupture increased in birth weight > or =4,000 g [20]. The present study reported many different indications of previous CS such as fetal distress, malpresentation, antepartum hemorrhage, failure to progress, eclampsia, intrauterine growth restriction, and others which showed that the commonest indication of previous CS was fetal distress 30%, but a study by Phelan et al. [21] and Dayal showed a lower rate of fetal distress (15%) [21]. The second indication of previous CS was malpresentation since it was a breech presentation (27%). On the other hand, a study by Vidyadhar B. Bangal showed that 80% of the success rate of VBAC in cases with a previous CS done for the breech presentation was higher than the present rate.
Another study also showed that the success rate of VBAC done for non-recurrent indications as malpresentation, premature rupture of membranes, fetal distress, pre-eclampsia, and post-term pregnancy was 80%–90%, but the success rate of VBAC was in the range of 60%–70% for indications like borderline cephalopelvic disproportion or non-progress of labor [13]. Almost 84% of cases delivered spontaneously without any induction but 17% were induced, this showed the success rate of VBAC. It is important to make a counseling for women about their choices of delivery and most important complications after a previous CS, and explain that VBAC had a lower rate of complications especially if the patient delivered vaginally before, as a study recently published on VBAC in grand multiparous women, reported that previous VD was highly associated with successful VBAC rate [22].

In Saudi Arabia, the obstetricians give the chance for all pregnant women to deliver vaginally even after CS to avoid complications. However, 78% of cases in the present study delivered without any postpartum complications, 17% had a postpartum hemorrhage and 5% had retained placenta but there was no infection and no uterine rupture. Many studies showed a low number of cases that complicated by a uterine rupture in VBAC. A study by Kimberly. D and Gregory M. D. showed that higher uterine rupture rates in women with prior cesareans in the range of 66% while the rate of developing uterine rupture in women with previous CS who underwent VBAC was 34% [23].

The present study showed that the interval between present pregnancy and previous CS was 86% of cases of more than 2 years interval and 14% of cases of less than 2 years interval. Shipp et al. [24] studied the risk of uterine scar dehiscence in relation to the interval between the present pregnancy and previous CS which reported that when the interval was less than 18 months rate of 2.3% for uterine rupture, as compared to 1% when the interval was more than 18 months. In contrast, the present study showed that no uterine rupture in both intervals. The present study showed high VBAC and fewer postpartum complications. The limitations of this study included the retrospective design, the absence of data of hours of delivery, augmentation of oxytocin, and a limited number of cases.

**Conclusion**

Women with a history of one previous CS were considered more favorable for vaginal delivery. The study showed the high success of vaginal birth after CS, with fewer maternal and neonatal complications.

**List of Abbreviations**

- BMI: Body mass index
- CS: Cesarean section
- VD: Vaginal delivery
- VBAC: Vaginal birth after cesarean section

**Conflict of interest**

The authors declared that there is no conflict of interest regarding the publication of this article.

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**Consent of publication**

Informed consent was obtained from all participants.

**Ethical approval**

Ethical approval was obtained from the Institutional Research and Ethics Board. The research was approved by irb of taibah university, college of medicine on 5/12/2017 with study id: PEP4-F11.

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