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Article

Pregnancy Outcome in Women with Previous One Caesarean Section

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Abstract: Women with a history of cesarean sections represent a high-risk obstetric group, raising concerns about maternal and neonatal outcomes. The practice of vaginal birth after cesarean (VBAC) has evolved, requiring further investigation into its impact on pregnancy outcomes. This study aimed to assess pregnancy outcomes in women with a single prior cesarean section, focusing on vaginal delivery rates and maternal complications. A retrospective analysis was conducted at Albatool Teaching Hospital, Iraq, reviewing the medical records of 90 women who delivered between August and December 2022. Among 36 women considered for trial of scar (TOS), 19 (21.1%) achieved successful vaginal delivery, while 17 (18.9%) required repeat cesarean sections. The results showed that women with previous vaginal deliveries, particularly those with a history of successful VBAC, had higher success rates in vaginal delivery. Careful patient selection and vigilant monitoring are essential for improving maternal and neonatal outcomes in this high-risk population. The findings highlight the need for judicious candidate selection for TOS to optimize pregnancy outcomes.

Keywords: VBAC, Trial of scar, Elective cesarean section, Maternal outcomes, Vaginal delivery

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1. Introduction

Caesarean section, commonly referred to as C-section or caesarean delivery, is a surgical intervention utilized for delivering one or more infants through an incision made in the maternal abdomen. This procedure is frequently indicated when vaginal delivery poses a potential risk to either the infant or the mother [1]. Indications for a caesarean section include obstructed labor, multiple pregnancies, maternal hypertension, breech presentation, and complications related to the placenta or umbilical cord [2,3]. Additionally, factors such as pelvic morphology and the patient's obstetric history, particularly previous caesarean deliveries, can also necessitate a C-section. In some cases, a trial of vaginal birth after prior caesarean section may be considered feasible. The World Health Organization (WHO) advocates that caesarean deliveries should be conducted solely when there is a medical justification for the procedure.

However, a significant proportion of caesarean sections are performed in the absence of a medical indication, often at the request of the mother. Caesarean sections are associated with a slight overall increase in adverse outcomes for low-risk pregnancies. Recovery from a C-section generally requires a longer healing period, approximately six

weeks, compared to that of vaginal delivery. The potential complications associated with this surgical procedure include respiratory issues in the newborn, as well as maternal risks such as amniotic fluid embolism and postpartum hemorrhage. Notably, the mode of delivery does not appear to significantly influence subsequent sexual functioning [4]. In 2012, approximately 23 million caesarean sections were performed worldwide. The international healthcare community has historically regarded cesarean rates between 10% and 15% as optimal [5]. The term "caesarean" or "cesarean" section is etymologically derived from the Latin word "caesus," which translates to "cut." The widespread belief that Julius Caesar was born via caesarean section has been perpetuated; however, there is no classical evidence to substantiate this claim.

In ancient Rome, the practice of performing caesarean sections was employed only as a last resort, typically reserved for women who had died during childbirth or for those who were in their tenth month of gestation and could not survive a vaginal delivery [6]. The association of the term "Caesar" with caesarean deliveries arises from the notion that Julius Caesar was "cut from the womb." Although variations in the spelling of "caesarean" and "cesarean" exist, the procedure continues to be a common and safe method for delivering infants in contemporary medical practice [7]. The risks associated with caesarean sections can significantly affect both infants and mothers [8]. For newborns, potential complications include breathing problems and the possibility of surgical injury during the procedure [9]. Mothers are also at risk for various adverse outcomes, including infections and blood loss. Additional risks encompass reactions to anesthesia and the formation of blood clots [10]. Furthermore, surgical injury during the caesarean delivery remains a concern [11].

The implications of undergoing multiple C-sections extend to increased risks in future pregnancies, notably the development of placenta previa and conditions such as placenta accreta, where the placenta abnormally adheres to the uterine wall. Additionally, there is an elevated risk of uterine rupture along the surgical scar line for women who opt for vaginal delivery after having undergone one or more caesarean sections. Vaginal birth after cesarean section (VBAC) refers to the process of delivering a baby vaginally in women who have previously undergone a cesarean delivery. Women opting for a VBAC typically engage in a trial of labor (TOL), which is also known as trial of labor after cesarean section (TOLAC) [12]. While TOL is widely regarded as an acceptable and generally safe practice, it carries the risk of serious complications, such as uterine rupture or uterine dehiscence, which may lead to maternal and/or neonatal morbidity.[13].

Therefore, healthcare providers responsible for the care of patients with a history of cesarean delivery must provide comprehensive counseling regarding the potential risks and benefits associated with TOL, as well as the factors that influence the likelihood of achieving a successful vaginal delivery [14]. Complications arising from trial of labor after cesarean section (TOLAC) can be significant, with uterine rupture being the most critical concern [15]. Uterine rupture occurs at the site of the incision made during the prior cesarean delivery and constitutes a medical emergency that necessitates immediate laparotomy to facilitate fetal delivery and address any additional complications [16]. The interruption of blood and oxygen transfer to the fetus during a uterine rupture can lead to severe fetal outcomes, including fetal acidosis, the requirement for neonatal intensive care unit (NICU) admission, and even mortality.

Although the absolute risk of perinatal mortality associated with TOLAC is relatively low, it is slightly elevated compared to that of infants born to mothers undergoing planned repeat cesarean delivery, with reported rates of 0.13% versus 0.05%, respectively. The risks to the mother in the event of uterine rupture are also considerable, as significant hemorrhage may occur, requiring blood transfusions and potentially hysterectomy to control the bleeding, which can be lifesaving [16]. Both vaginal birth attempts and elective repeat cesarean sections (ERCS) present distinct risks to the mother and newborn,

necessitating careful consideration and weighing of these risks when formulating a delivery plan [17]. The primary aims of our study were to assess the pregnancy outcomes in women with a history of cesarean delivery concerning vaginal delivery, maternal complications, and to identify factors that may influence the success of the trial of labor [18].

2. Materials and Methods

This study was conducted in Albatool teaching hospital Diyala, Iraq. Approval was obtained from the Ethics Committee, and a retrospective analysis of medical records of 90 women with previous one cesarean section who delivered during the time (August 2022_December 2022) was carried out.

2.1. Inclusion criteria

The study included participants aged between 20 and 41 years, with a gestational age of 37 weeks or greater. Both single and twin pregnancies were considered for inclusion in the analysis. Additionally, only those cases without significant complications in previous pregnancies, such as uterine rupture, were selected. The cohort encompassed a range of fetal presentations, incorporating both cephalic and breech presentations. This diverse recruitment criteria aimed to obtain a comprehensive understanding of the factors influencing outcomes in vaginal birth after cesarean section (VBAC).

2.2. Exclusion criteria

The study established specific exclusion criteria to ensure the safety and appropriateness of participants. Individuals under the age of 20 or over the age of 41 were excluded from the study. Additionally, pregnancies considered premature, defined as less than 36 weeks gestation, were not included. Participants with a history of significant complications in previous pregnancies, such as uterine rupture, were also excluded.

Furthermore, women who had undergone more than one previous cesarean delivery, those with uterine surgeries involving the cavity or with known scar ruptures or extensions, individuals with an inter-delivery interval of less than 18 months, and those with an unknown type of previous uterine scar were referred for elective repeat cesarean section (ERCS). The mode of delivery was typically determined during antenatal visits, generally around 36 weeks gestation, after appropriate counseling. For unbooked patients who presented to the labor ward, the decision regarding the mode of delivery was made at that time. For individuals planning to undergo trial of labor (TOL), spontaneous onset of labor was allowed until 40 weeks' gestation. Induction of labor was performed when the cervical dilation reached 3 to 4 cm, using artificial rupture of membranes (ARM), while continuous monitoring of cervical dilation and descent was conducted using a partograph. It is important to note that prostaglandins and oxytocin were not employed for cervical ripening. Maternal outcomes were assessed based on the type of delivery (vaginal birth after cesarean [VBAC], ERCS, or failed VBAC), occurrence of scar dehiscence (complete or partial), visceral injury, postpartum hemorrhage necessitating blood transfusion, uterine rupture, adherent placenta, hysterectomy, and maternal death. Descriptive statistics were utilized to analyze both continuous and categorical data, with results presented as means, standard deviations, and percentages. Proportions were analyzed using the chi-square test, and a p-value of ≤ 0.05 was considered statistically significant.

3. Results

A total of 90 women with a history of one prior cesarean delivery were included in the study. Among these participants, various indications for the previous cesarean section were identified. The most prevalent reason was malpresentation, which accounted for 15 cases (16.7%). This was followed by post-dates, which represented the second most

common indication, occurring in 12 women (13.3%). Other reasons for the previous cesarean deliveries included the following: 3 women (3.3%) were noted to have delivered a macrosomic infant, while 9 women (10.0%) presented with oligohydramnios. Malposition was recorded in 5 women (5.6%), and 3 women each (3.3%) experienced post-term deliveries, short inter-delivery intervals, and twin pregnancies. Additionally, failure to progress was cited as the indication for cesarean delivery in 9 women (10.0%), and intrauterine growth restriction (IUGR) was noted in 5 (5.6%). Other complications included fetal distress in 8 women (8.9%) and antepartum hemorrhage in 6 women (6.7%). Notably, for 9 women (10.0%), the specific indication for cesarean delivery was not available.

Table 1. Indications for cause of cesarean section

Cause	Frequency	Percent
al presentation	15	16.7
post date	12	13.3
Oligohydramnios	9	10.0
data not available	9	10.0
failure to progress	9	10.0
fetal distress	8	8.9
antepartum hemorrhage	6	6.7
malposition	5	5.6
IUGR	5	5.6
post term	3	3.3
big baby	3	3.3
short inter delivery interval	3	3.3
twin pregnancy	3	3.3
Total	90	100.0

The study identified three distinct outcomes related to the pregnancies of the participants: failed vaginal birth after cesarean (VBAC), successful VBAC, and elective repeat cesarean section (ERCS). Among the 90 women included in the study, 54 women (60.0%) underwent elective repeat cesarean sections without prior trials, while 19 women (21.1%) experienced successful VBACs after attempting labor. Conversely, 17 women (18.9%) had failed VBAC trials, indicating an unsuccessful attempt at vaginal delivery following a prior cesarean. These findings are summarized in Table 2, which details the pregnancy outcomes following one prior cesarean delivery.

Table 2. Pregnancy Outcomes Following One Prior Cesarean Delivery

Category	Frequency	Percent
ERCS	54	60.0
successful VBAC	19	21.1
failed VBAC	17	18.9
Total	90	100.0

The analysis categorized participants into two groups based on their delivery outcomes following one prior cesarean section. In the first category, which included 49 women who had deliveries after one cesarean section, it was observed that 14 women (28.6%) experienced failed trial of scar (TOS), while 4 women (8.1%) were successful in their TOS attempts. Notably, the majority, totaling 31 women (63.3%), underwent

cesarean deliveries without attempting TOS. In the second category, consisting of 41 multiparous women with a history of one previous cesarean section, the outcomes differed substantially. Here, only 4 women (7.5%) had failed TOS, while a larger percentage, 14 women (35.0%), achieved successful TOS. Additionally, 23 women (57.5%) underwent cesarean deliveries without attempting TOS. These findings demonstrate distinct differences in delivery outcomes influenced by parity following a cesarean section, as summarized in Table 3.

Table 3. Impact of Parity on Delivery Outcomes Following One Cesarean Section

Delivery after one caesarean section	**Failed TOS**	**Successful TOS**	**Cesarean without TOS**
49	14	4	31
100%	28.6%	8.1%	63.3%
Delivery in multiparous women with previous one cesarean section	Failed TOS	Successful TOS	Cesarean without TOS
41	4	14	23
100%	7.5%	35.0%	57.5%

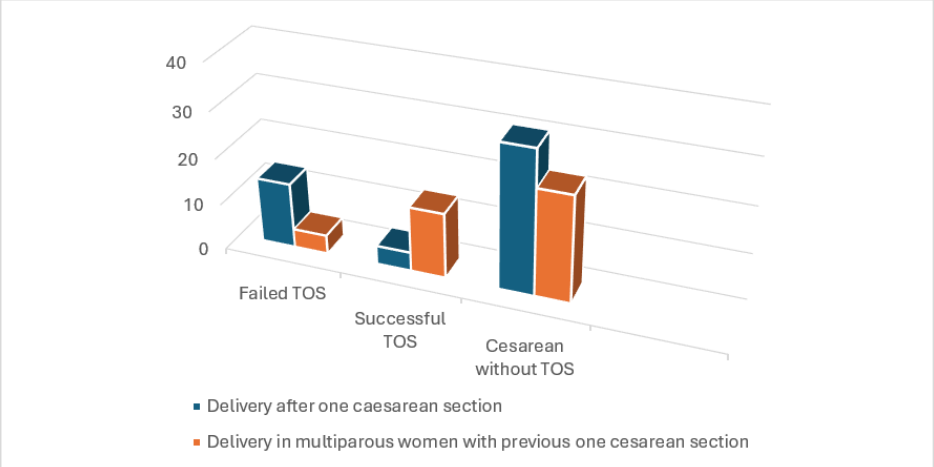

Figure 1. Comparative between Delivery after one caesarean section and Delivery in multiparous women with previous one cesarean section.

4. Discussion

Cesarean section (CS) is a significant obstetric procedure that has seen a substantial increase in prevalence globally over the past few decades. The primary outcomes of this study were categorized into three distinct groups: failed vaginal birth after cesarean (VBAC), successful VBAC, and elective repeat cesarean section. Among the 90 women with a history of one prior cesarean delivery, 54 individuals (60%) opted for an elective repeat cesarean section without attempting a trial of scar (TOS), while 19 women (21.1%) successfully achieved VBAC following a TOS. Conversely, 17 women (18.9%) experienced a failed VBAC after TOS. These results underscore the critical importance of meticulous patient selection and monitoring during TOS, as well as the necessity for individualized decision-making regarding the preferred mode of delivery following a previous cesarean

section. A study conducted at Mafraq Hospital in Abu Dhabi assessed 151 women with a history of one prior cesarean section.

Among these participants, the findings revealed that 36 women (23.8%) underwent elective repeat cesarean section (ERCS), 19 women (12.6%) experienced failed vaginal birth after cesarean (VBAC), and 96 women (63.6%) achieved successful VBAC [21]. These results differ significantly from those observed in our study. Such discrepancies may be attributed to several factors, including the limited sample size, patients' preferences for delivery via cesarean section, suboptimal antenatal care, and a lack of adequate facilities for effective monitoring during trial of scar (TOS). A study conducted at Ayub Teaching Hospital in Abbottabad, Pakistan, analyzed a total of 2,652 deliveries during a specified period, among which 300 patients had a history of delivery following one prior cesarean section. The findings indicated that 80 women (27.1%) experienced failed trials of scar (TOS), while 40 women (9.3%) achieved successful TOS; additionally, 180 women (63.6%) underwent cesarean sections without attempting TOS.

These results align closely with those obtained in our research, where 14 women (28.6%) experienced failed TOS, 4 women (8.1%) achieved successful TOS, and 31 women (63.3%) underwent cesarean sections without TOS. This similarity in outcomes underscores consistent trends in delivery scenarios following prior caesarean sections across different settings [22]. In our study, the most common indication for cesarean section was found to be malpresentation. This was attributed to factors such as multiparity, polyhydramnios, low-lying placenta, the presence of fibroids, and twin pregnancies.

The second most prevalent indication was post-dates, which was associated with inadequate maternal education resulting in insufficient follow-up care; these women were consequently admitted to the hospital as cases of post-dates pregnancy. In contrast, a study conducted in Ethiopia identified obstructed labor as the most frequent indication for cesarean section, followed by fetal distress as the second most common cause. It is important to note that research on pregnancy outcomes in women with a prior cesarean section has certain limitations that must be acknowledged when interpreting the results. These limitations encompass potential selection bias, the presence of confounding factors, a limited sample size, retrospective study design, variability in clinical care, and a lack of long-term follow-up.

5. Conclusion

In conclusion, the careful selection of suitable candidates for a trial of scar (TOS), particularly those without prior significant complications, accompanied by vigilant maternal and fetal monitoring, can lead to successful pregnancy outcomes, reducing the necessity for repeat cesarean deliveries. The study reinforces that multiparous women with a history of previous vaginal deliveries, particularly prior successful VBACs, are more likely to achieve successful vaginal births. Positive factors such as spontaneous labor onset, adequate pelvic dimensions, and favorable parity increase the likelihood of success in TOS, emphasizing the need for personalized risk assessment in future pregnancies. These findings suggest that individualized care and informed patient decision-making can mitigate the rising cesarean section rates and associated complications. Future research should focus on larger cohorts and explore the long-term maternal and neonatal outcomes of TOS versus repeat cesarean, particularly in diverse obstetric populations.

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