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Research Article

Maternal and Fetal Outcome of Vaginal Birth after Cesarean Section (VBAC) at Al Mak Nemir University Hospital and Shendi Teaching Hospital - Sudan

Sami Hummeda Elnour Hummeda[1], Sami Tag Elsir[2], Ibrahim Bakhit Yousif Elemam[3] and Ghanem Mohammed Mahjaf[4]*

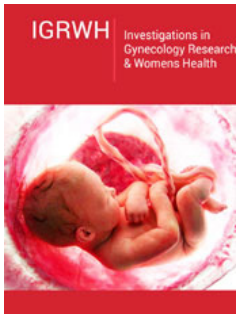
[1]Department of Obstetrics and Gynecology, Faculty of Medicine, Shendi University, Sudan

[2]Department of Obstetrics and Gynecology, Al Mak Nimir Hospital in Shendi locality, Sudan

[3]Department of Histopathology and Cytology, Faculty of Medical Laboratory Sciences, Shendi University, Sudan

[4]Department of Medical Microbiology, Faculty of Medical Laboratory Sciences, Shendi University, Shendi, Sudan

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***Corresponding author:** Ghanem Mohammed Mahjaf, Department of Medical Microbiology, Faculty of Medical Laboratory Sciences, Shendi University, Shendi, Sudan

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Abstract

Background: The rising global rate of cesarean section has prompted renewed focus on vaginal birth after cesarean as a safe and effective alternative to repeat CS in properly selected women.

Objective: To determine maternal and fetal outcomes of vaginal birth after caesarian section. Methods: This was a hospital-based descriptive cross-sectional study conducted at Al Mak Nimir University Hospital and Shendi Teaching Hospital, Sudan. The study included 50 women with a history of previous cesarean section who presented for delivery during the study period. Data were collected using a structured questionnaire after obtaining informed consent. Descriptive statistical analysis was performed using SPSS version 25.

Results: A total of 50 women with a history of previous cesarean section were included in the study. The maternal and neonatal outcomes were assessed, including the mode of delivery, maternal complications, and neonatal complications. Successful vaginal birth after cesarean section was recorded in 11 women (22%), while 6 women (12%) experienced failure of VBAC, according to the available data.

Conclusion: The study documented maternal and neonatal outcomes among women with a previous cesarean section. However, the available data were insufficient to establish a definitive VBAC success rate. Further studies with complete obstetric records and clearly documented trial-of-labor outcomes are needed to provide a more reliable assessment of VBAC outcomes.

Keywords: Vaginal birth after caesarean section; Trial of labour after caesarean; Maternal outcome; Neonatal outcome; Uterine rupture

Introduction

Vaginal Birth after Cesarean Section (VBAC) is the term applied to women who undergo vaginal delivery following cesarean delivery in a prior pregnancy. Patients desiring VBAC delivery undergo a Trial of Labor (TOL) or trial of Labor after Cesarean Section (TOLAC). While TOL is an acceptable, generally safe practice, serious, potential complications include uterine rupture or dehiscence with associated maternal and/or neonatal morbidity. Providers caring for patients with prior cesarean section need to be aware of and able to counsel patients regarding risks and benefits of attempting TOL, factors which affect the likelihood of successful vaginal delivery, and knowledgeable regarding intrapartum management of

patients undergoing TOLAC [1]. Caesarean section has become the commonest surgery performed on women during the child bearing years. In the subsequent pregnancy after caesarean section, the mode of delivery is either an elective caesarean section or a vaginal birth after caesarean section. Nevertheless, despite the known risks (0.5-1% rate of uterine rupture), TOLAC remains an attractive option for many patients and leads to a successful outcome in a high proportion of cases. In comparison, the alternative of elective repeat cesarean delivery is not without risks.

In addition to the inherent risks that cesarean delivery has over vaginal delivery, patients may experience uterine rupture prior to the onset of labor [2]. Decision to undergo TOLAC is an individual one that should be based on careful, thorough counseling. Maternal characteristics and obstetric history can provide a patient a rough estimate of her chance of a successful trial of labor. This same obstetric history can be used to estimate a patient's risk of uterine rupture. Avoiding induction of labor is well recommended because induction of labor decreases the probability of success and increases the chance of uterine rupture in a trial of labor after cesarean delivery. Counseling the patients is important before undergoing TOLAC to be evaluated early in labor and to manage the pregnancy in a hospital setting in which uterine rupture can be both recognized and managed expediently [3]. As the cesarean delivery rate has increased so has the number of patients becoming pregnant who have experienced cesarean section in a prior pregnancy. Patients may undergo vaginal birth after cesarean section either as a planned procedure or due to precipitant labor. Since 1970, the rate of cesarean delivery has increased dramatically from 5% in 1970 to 30% in 2005 [4]. The rate of cesarean delivery peaked in 2009 at 32.9% and was 31.9% in 2016 [5].

Materials and Methods

Study design and setting

A hospital-based descriptive cross-sectional study was conducted at El Mek Nimer University Hospital in Shendi, Sudan, from June to December 2024.

Study population and sample

The study population consisted of women with a history of previous cesarean section who presented for delivery at the selected hospitals during the study period. A total of 50 eligible women were included in the final analysis. All participants had a history of one previous cesarean section. The analysis focused on maternal and neonatal outcomes following the previous cesarean delivery, including the mode of delivery and associated complications.

Data collection

Data were collected through individual interviews using a semi-structured, pretested questionnaire written in simple language. The questionnaire captured sociodemographic and obstetric information. Participants who could read and write completed the questionnaire, while those who could not were interviewed by the data collector. The source manuscript states that informed consent was obtained before participation.

Statistical analysis

Data were entered and analysed using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive statistics, including frequencies and percentages, were used to summarise the study variables. No inferential statistical analysis is reported in the source manuscript.

Results

A total of 50 women with a history of one previous caesarean section were included. The available descriptive findings are presented below. Percentages are reported as provided in the source tables; where the source data do not reconcile with the stated denominator, this is explicitly indicated. The age distribution reported in the original abstract showed that 19 women (38%) were aged 21–25 years and 13 (26%) were aged 26–30 years. The abstract also reported that 8 women (16%) were younger than 20 years and 10 (20%) were older than 35 years. Regarding parity, 12 women (24%) were primiparous, 25 (50%) were multiparous, and 13 (26%) were grand multiparous. These distributions were not presented in a source table. The most common indication for the previous caesarean section was breech presentation (40%), followed by maternal causes (26%), fetal causes (22%), and labour dystocia (12%) (Table 1). The relationship between gravidity, parity, and the outcome of trial of labor after cesarean section (TOLAC) was assessed to explore the potential influence of previous obstetric history on the success or failure of vaginal birth after cesarean section. The analysis aimed to identify whether the number of previous pregnancies and deliveries was associated with the likelihood of successful vaginal delivery or repeat cesarean section. Regarding birth weight, 23 neonates (46%) were in the 2.6–3.0kg category, 14 (28%) weighed less than 2.5kg, and 11 (22%) weighed 3.1–3.5kg (Table 2). The frequencies total 48 rather than 50; therefore, the birth-weight data for two participants are unaccounted for in the original figure.

Table 1: Indications for the previous caesarean section among the 50 participants.

Previous Caesarean Indication	Frequency (n)	Percentage (%)
Breech presentation	20	40
Fetal causes	11	22
Labour dystocia	6	12
Maternal causes	13	26
Total	50	100

Table 2: Birth-weight categories recorded in the original figure.

Birth-Weight Category	Frequency (n)	Percentage (%)
Less than 2.5kg	14	28
2.6–3.0kg	23	46
3.1–3.5kg	11	22
Not accounted for in source figure	2	4
Total participants	50	100

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Apgar scores were above 7 in 24 neonates (48%), between 5 and 7 in 11 (22%), and between 1 and 5 in 15 (30%) (Table 3). The category boundaries overlap at scores of 5 and 7 as written in the original table and should be checked against the case records. The most frequently reported neonatal complication was respiratory distress (24%), followed by fever (18%) and nursery admission (16%). Fresh stillbirth was recorded in 12% and transient tachypnoea of the newborn in 8%; 22% were recorded as having no neonatal complication (Table 4). The maternal outcome table recorded successful VBAC in 11 women (22%) and failure of VBAC in 6 (12%). Uterine rupture was recorded in 13 women (26%), postpartum haemorrhage in 9 (18%), scar dehiscence in 5 (10%), blood transfusion in 5 (10%), and death in 1 (2%) (Table 5).

Table 3: Apgar-score categories as reported in the source table.

Apgar score	Frequency (n)	Percentage (%)
1–5	15	30
5–7	11	22
>7	24	48
Total	50	100

Table 4: Neonatal complications recorded among the 50 participants.

Neonatal Outcome/ Complication	Frequency (n)	Percentage (%)
Fever	9	18
Fresh Stillbirth (FSB)	6	12
No complication recorded	11	22
Nursery admission	8	16
Respiratory distress	12	24
Transient Tachypnoea of the Newborn (TTN)	4	8
Total	50	100

Table 5: Maternal outcomes recorded among the 50 participants.

Maternal Outcome	Frequency (n)	Percentage (%)
Blood transfusion	5	10
Death	1	2
Failure of VBAC	6	12
Postpartum haemorrhage	9	18
Uterine rupture	13	26
Scar dehiscence	5	10
Successful VBAC	11	22
Total	50	100

Discussion

This study assessed maternal and neonatal outcomes among 50 women with a previous cesarean section. The available findings included the indications for previous cesarean delivery, neonatal birth weight, Apgar scores, neonatal complications, and maternal outcomes. Regarding the mode of delivery, successful VBAC was recorded in 11 women (22% of the total study sample), whereas failure of VBAC was recorded in 6 women (12%). However, the available information does not account for the remaining 33 participants in terms of their trial-of-labor status and final mode of delivery. Therefore, a definitive VBAC success rate could not be established from the available records. The relationship between gravidity, parity, and VBAC outcomes could not be evaluated because individual-level data were unavailable. This limits the ability to identify obstetric factors associated with successful or unsuccessful vaginal delivery. Similar to systematic review by Lehman et al. [6] reported successful vaginal birth rates of 60%–87% after a previous CS. The rate of successful VBAC is reported as 84.7% in the USA, 86.6% in Canada, 80.7% in Taiwan, 62.8% in Norway, 61.8% in Nigeria, 57.6% in the Democratic Republic of Congo, 80.4% in Addis Ababa, Ethiopia, and 79.4% in sub-Saharan Africa [6]. Study from Sudan by Handady et al. [7] reported that the success full VBAC was 67.3% [7]. Thapsamuth dechakorn et al. study reported 60% successful VBAC [8]. Regarding maternal outcome, the women with complications were 73(45.1%). The maternal complications were postpartum hemorrhage 47(29%), uterine rupture 24(14.8%), perineal tear 10(6.2%), uterine dehiscence 6(3.7%) and sepsis 2(1.2%). Moreover, the women needed blood transfusion were 13(8%) and the women admitted to intensive care unit were 8(4.9%). No maternal deaths were reported. Similar to meta-analysis of 13 studies by Chen and Mi which compared 1892 cases of VBAC with 1703 cases of planned repeat CS, found no statistically significant difference in the incidence of Postpartum Hemorrhage (PPH) between VBAC and planned repeat CS (28.17% vs. 4.40% [9]. Balachandran et al. [10] in United Arab Emirate found that in women planned for VBAC there were cases of primary Postpartum Hemorrhage (PPH) and cases of scar dehiscence [10]. Young et al. [11] study showed that Absolute rates of severe maternal morbidity and mortality were low but significantly higher after attempted vaginal birth after cesarean delivery compared with elective repeat cesarean delivery (10.7 v. 5.65 per 1000 deliveries, respectively). Adjusted rate differences in severe maternal morbidity and mortality, and serious neonatal morbidity and mortality were small (5.42 and 7.09 per 1000 deliveries, respectively; number needed to treat 184 and 141, respectively) [11]. In fetal and neonatal outcome, the majority of the babies 159(8.1%) were alive. Adverse fetal outcome were stillbirths 3(1.9%), low birth weight 52(32.4%), low Apgar score 27(16.7%), birth asphyxia 15(9.3%), birth trauma 9(5.6%), sepsis 4(2.5%) and Hypoxic Ischemic Encephalopathy 4(2.5%). The neonates admitted to neonatal intensive care unit were 33(20.4%) and all of them were discharged alive and well. Comparable to Studies show that although the absolute risk is low, perinatal and neonatal mortality rates are higher for VBAC than for planned repeat CS (130/100 000 vs. 50/100 000 live births for perinatal mortality and 110/100 000 vs. 50/100 000 for neonatal mortality: moderate grade of evidence). The absolute risk of perinatal mortality ranged from 0 to 3.8/1000 births for planned VBAC and 0-1/1000 for planned repeat CS, while the absolute risk of neonatal mortality ranged from 0 to 3/1000 for planned VBAC and 0-1/1000 for planned repeat CS.

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The frequency of antepartum stillbirth at 37-38 weeks of gestation was higher among women who underwent VBAC than among women who underwent planned repeat CS (0.4% vs. 0.1%; P=0.008). There were no statistically significant differences in rates of antepartum stillbirths at ≥39 weeks of gestation, intrapartum stillbirths, and neonatal mortality [12]. Another, study showed A statistically significant higher incidence of Apar score <7 at 5 min following VBAC than following planned repeat CS Durnwald and Mercer reported no significant difference in 5-min Apgar score between VBAC and planned repeat CS [13]. Kok et al. [14] showed that There is insufficient/low-grade evidence on neonatal sepsis following VBAC compared with planned repeat CS to make any meaningful conclusions [14]. Macharey et al. [15] showed that Neonates of a subsequent delivery after cesarean breech delivery had an increased risk for arterial umbilical cord pH below seven, a higher rate of a 5 min Apgar score <7 and a higher rate of neonatal intensive care unit admission [15].

Conclusion

This study described maternal and neonatal outcomes among women with a previous cesarean section. Although successful VBAC was recorded in some participants, the available data were insufficient to determine the overall success rate of trial of labor after cesarean section. Maternal and neonatal complications were also documented. Further studies involving complete obstetric records, clearly defined study populations, and appropriate statistical analysis are recommended to provide more reliable evidence regarding VBAC outcomes.

Ethical Considerations

We obtained written informed consent from all participants before data collection. We clearly explained the study's purpose and objectives to each participant and informed them of their right to participate voluntarily and withdraw at any time without consequence. Confidentiality and privacy were strictly maintained throughout the study. All collected data were securely handled and used exclusively for research purposes. Participants' identities were kept anonymous, and no personally identifiable information was disclosed.

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