

# Factors Influencing Success of Vaginal Delivery after Caesarean Section among Women with One Previous Scar at Hoima Regional Referral Hospital, Western Uganda

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## ABSTRACT

The general objective of the study was to investigate the factors influencing the success of VBAC among women with one previous scar at HRRH. The specific objectives of the study were; to determine the rate of VBAC among women with one previous scar at HRRH, to determine obstetric factors influencing success of VBAC among women with one previous scar and to assess the socio-demographic factors influencing success of VBAC among women with one previous scar. This study was a hospital based cross-sectional investigation. All pregnant women delivering at HRRH who have delivered by caesarean section before with one previous scar were included in the study data once they provided their consent. Analysed data was presented in tables and figures showing frequencies and proportions. Majority of the women (81.7%) had attended ANC, although only 16.7% had attended the minimum recommended amount of 4 times. 70% were at 37-42 weeks of gestation at the time of labour. In the conclusions chapter of this investigation, it was revealed that successful vaginal delivery after one previous caesarean scar was associated with past obstetrics performance, and to a larger extent, the current labour processes. The main determinants included history of stillbirth, history of successful VBAC in the past, rupture of membrane, absence of meconium, cervical stage of labour at admission, position of the presenting part, duration of labour, and knowledge of the previous indication for the past caesarean section. The study concluded that Routine amniotomy should be discouraged to decrease incidence of prolonged rupture of membranes. The review at two weeks post-caesarean delivery should be emphasized because most SSI developed after discharge and within the first two weeks after surgery.

**Keywords:** vaginal delivery, caesarean section, women and scar.

## INTRODUCTION

Caesarean section refers to a surgical procedure whereby the baby is removed from the mother's uterus through an incision in the abdominal wall [1-6]. It is the most common Obstetric surgical operation in developed societies, as it is considered the safest procedure to resolve complications of vaginal birth and maintain foetal wellbeing [7]. Caesarean section has been a part of human culture since ancient times, and there are historical records in both Western and Eastern cultures of this procedure resulting in healthy mothers and offspring [8-11]. Numerous references to caesarean section appear in ancient Hindu, Egyptian, Grecian, Roman and other European folklore [12]. Furthermore, in 1988, American College of Obstetrician Gynaecologist (ACOG) recommended that, in the absence of a contraindication, a woman with one previous low transverse Caesarean delivery should be counselled

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to attempt labour in a subsequent pregnancy [13]. This coined the term TOLAC which is regarded a reasonable choice (considering both maternal and infant health) for pregnant women with a history of CS [14]. When medically justified, a caesarean section can effectively prevent maternal and perinatal mortality and morbidity. However, there is no evidence showing the benefits of caesarean delivery for women or infants who do not require the procedure [15]. As with any surgery, caesarean sections are associated with short and long-term risks which can extend many years after the current delivery and affect the health of the woman, her child, and future pregnancies. These risks are higher in women with limited access to comprehensive obstetric care [16]. The international healthcare community considers that the ideal rate for caesarean sections to be between 10% and 15% [15]. Since then, caesarean sections have become increasingly common in both developed and developing countries [17]. Worldwide, repeat caesarean delivery rates have reached their highest levels. Even though variation exists in the rates across countries; currently the rate ranges from 10% to 40% [13]. Globally, many countries exceed the 50% caesarean section rate, especially in developing countries [7]. Most researchers believe that the main causes of this rise are the continuous monitoring of the foetal heart during labour, the lack of experience in dealing with instrumental delivery, the lack of experience in vaginal breech delivery, and maternal request. Repeat caesarean section after a previous procedure is also major contributing factor [8].

Emergency repeat CS is not the only delivery mode available for pregnant women with a history of CS. Vaginal birth after CS (VBAC) is another option that can reduce the risk of maternal complications, shorten maternal recovery time, improve maternal satisfaction, and be more cost effective than ERCS [14]. Trial of labour after caesarean delivery (TOLAC) represents one of the major changes in obstetric practice in recent times and has been considered a key method for the reduction of the caesarean delivery rate [18]. The route of delivery after one previous lower segment caesarean section (CS) represents one of the most significant and challenging debates in contemporary obstetric practice [13]. However, for women with a prior caesarean delivery, a trial of labour will often represent her last opportunity to experience a normal birth (VBAC) [19]. However, a failed VBAC increases the risk of maternal and perinatal complications more than an elective repeat CS [20]. Women with a prior caesarean delivery have an increased risk of uterine rupture, particularly during labour, as compared with those without a uterine scar [21]. However, VBAC is associated with less blood loss during delivery, shorter duration of hospitalization and decreased rate of blood transfusion, intra partum and postpartum infection and thromboembolic events. Therefore, an increased rate of VBAC would decrease economic burden of nations and individuals [1]. Candidates for a trial of labour are women with one previous caesarean section, low transverse hysterotomy and singleton pregnancy with no contra-indication for vaginal delivery [22]. The success rate of VBAC ranges from 60–80% as reported by 11 different authors, provided that the previous caesarean section is done for nonrecurring indications [23–26]. Extensive research has been done to identify the factors influencing the success of VBAC. [1]. The factors with decreased likelihood of success include age, body mass index (BMI), microsomia, labour induction, and the indications for previous CS such as cephalopelvic disproportion (CPD) dystocia or failure to progress and failed induction [20]. In comparison, the factors associated with success include; previous VB before CS, previous VBAC, Bishop score at admission before delivery, foetal malpresentation as the indication for previous CS, and white race [21, 27].

## METHODOLOGY

### Study design

This was a hospital based cross-sectional study. The study design provides a basis for describing the status of phenomena at a fixed point in time and does not allow for inference of changes and trends over time.

### Study area

The study was conducted at Hoima Regional Referral Hospital in the surgical department.

### Study population

Women delivering at Hoima Regional Referral Hospital and have had a caesarean section before.

### Selection criteria

### Inclusion criteria

All pregnant women delivering at HRRH who have delivered by caesarean section before with one previous scar. The consent of the pregnant women was acquired before they were included in the study.

### Exclusion criteria

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The exclusion criteria included women with premature rupture of membrane.

**Sample size determination**

The sample size was calculated using the probability sampling formula by (Fischer et al, 1991):

$$n = \frac{Z^2pq}{d^2}$$

Where:

- n = sample size when the population size is greater than 10,000;
- z = Standard normal deviation of 1.96, set at 95% confidence level;
- p = 1.5%;
- q = 1- p which is the expected non-prevalence;
- d = Desired degree of accuracy.

If the value of p = 9.6% =0.096 [19]

$$n = \frac{1.96^2 * 0.096 * (1 - 0.096)}{0.05^2}$$
$$n = 125$$

**Sampling procedures**

Consecutive sampling technique was used to sample the study participants whereby a patient coming in and meets the inclusion criteria was enrolled into the study.

**Study procedure**

**Data analysis**

Analysed data was presented in tables and figures showing frequencies and proportions. Univariate analysis was done for continuous variables to report measures of central tendency like mean, median and mode and measures of dispersion like the range, interquartile range, and measures of variance like standard deviation for various independent variables. For categorical variables, data presentation was through well summarized “2 by 2” tables that show frequencies (percentages) and totals. For continuous and categorical data, bar graphs, histograms, pie charts were used where suited to present the data.

**Ethical considerations**

The permission to conduct this study was sought from Kampala International University Research Ethics Committee, Institution Review Committee and HRRH. The study was granted an ethical clearance certificate. Participants enrolled were requested to sign consent after thorough explanation of purpose of the study, risks involved and use of data to be collected. Numbers instead of names were used in all the questionnaires for confidentiality.

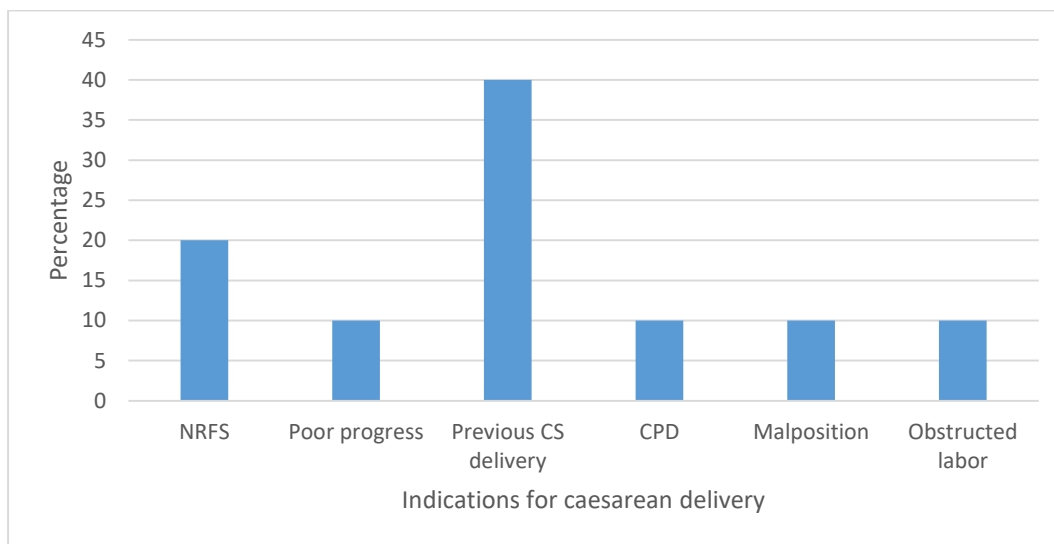
RESULTS

Table 1: Socio demographic characteristics

Characteristics		Frequency	Percent
Age (years)	<20	7	5.8
	21-29	79	65.9
	30-39	28	23.3
	40+	6	5
Religion	Christian	86	71.7
	Muslim	34	28.3
Marital status	Married	95	79.2
	Not married	25	20.8
Education level	None	10	8.3
	Primary	20	16.7
	Secondary	60	50
	Tertiary	30	25
Employment status	Employed	20	16.7
	Unemployed	50	41.6
	Business	50	41.6

**Table 2: Obstetric and labour characteristics**

Variables	Frequency	Percent
<b>Parity</b>		
0	20	16.7
1	50	41.7
2	40	33.3
3+	10	8.3
<b>Gestation (weeks)</b>		
<37	30	25
37-42	70	58.3
>42	10	8.3
<b>ANC attendance</b>		
Attended	98	81.7
Did not attend	22	18.3
<b>Number of ANC visits</b>		
1	10	8.3
2	60	50
3	30	25
4+	20	16.7



**Figure Error! No text of specified style in document.-1: Indications for caesarean delivery**

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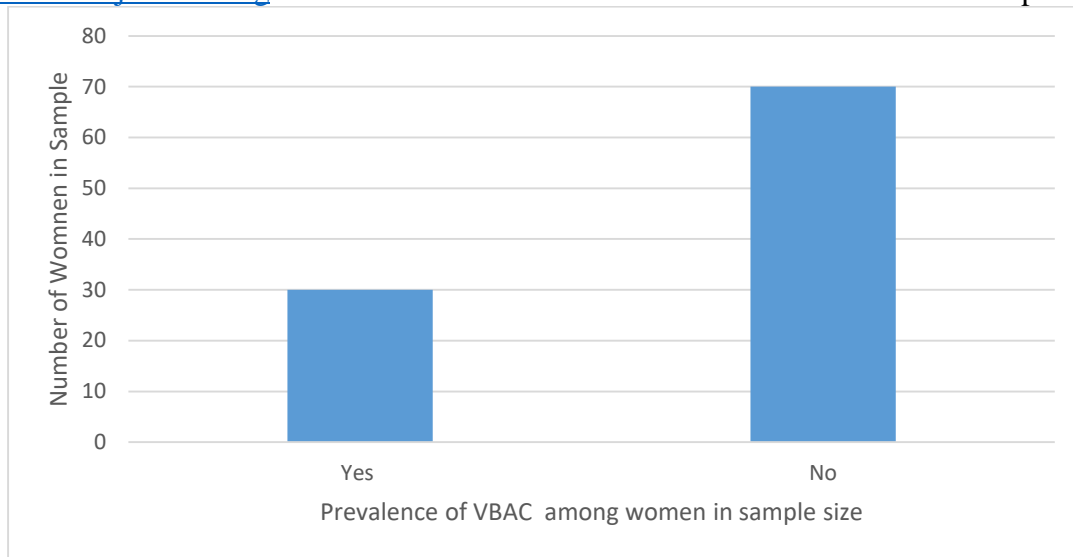
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Table 4-3 below shows operation characteristics. Majority (81.6%) were operated for a duration of 30-60 minutes with Pfannenstiel abdominal incision accounting for 75%. Most of the women had an emergency operation (83.3%) and were given antibiotics post operatively (66.7%).

**Table 3: Indications for elective repeat cesarean section**

Characteristics	Frequency	Percent
<b>Category of caesarean delivery</b>		
Emergency	100	83.3
Elective	20	16.7
<b>Type of abdominal operation</b>		
Pfannenstiel	90	75
Longitudinal	30	25
<b>Duration of operation</b>		
<30 min	11	9.2
30-60 min	98	81.6
60-90 min	11	9.2
<b>Intraoperative blood loss</b>		
<500 mls	30	25
500-1000 mls	90	75
<b>Antibiotic administration</b>		
Preoperative	2	2.0
Intraoperative	38	31.3.0
Post operative	80	66.70

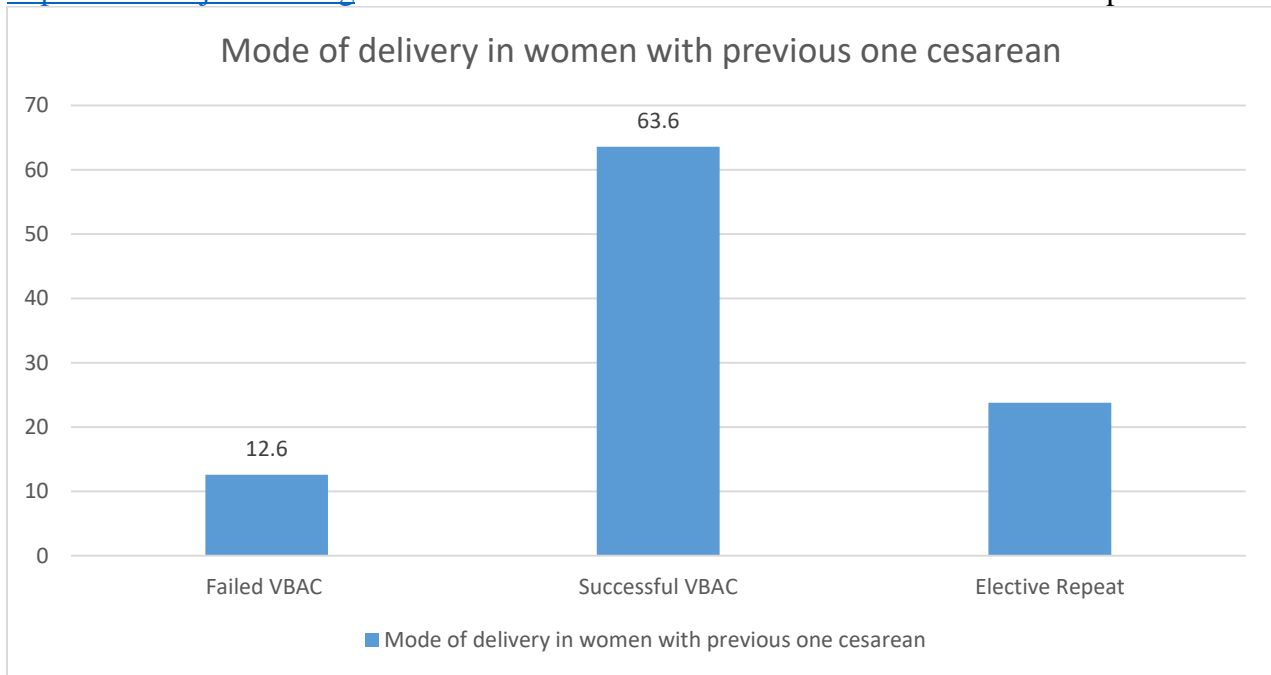
The prevalence of VBAC among women with one previous scar is shown in Figure 4-2 below. It is shown that 30% (n=120) of the women under investigation had VBAC, while majority (70%) had no VBAC among women with one previous scar.



**Figure 2: Rate of VBAC among women with one previous scar**

**Table 4: Types of surgical site infection**

Type	Frequency	Percent
Superficial	22	22.0
Deep	8	8.0
<b>Total</b>	30	30.0



**Figure 3: Mode of delivery in women with one previous caesarean**

From findings, 27.5% showed that operative notes were not available unlike few of (4.2%) cited on Twin pregnancy, short inter delivery interval and previous rupture uterus which indicated for elective repeat caesarean section. The data from these investigations with the given sample size are shown in Table 4-5 below:

**Table 5: Indications for elective repeat caesarean section**

	Number (n)	Percentage (%)
Operative notes not available	33	27.5
Big baby	16	13.3
Malpresentations	20	16.7
Patient request	16	13.3
Previous uterine incision extension	10	8.3
Previous rupture uterus	5	4.2
History of posterior repair	10	8.3
Short inter delivery interval	5	4.2
Twin pregnancy	5	4.2
Total	120	100

**DISCUSSION**

Majority (81.7%) had attended ANC, although only 16.7% had attended at least the 4 recommended times. 70% were between 37-42 weeks of gestation at the time of labour. However, a study in China showed that inter-delivery interval is not associated with VBAC success [20]. Status of membrane at admission has also been found to be an important factor in predicting success of VBAC, whereby mothers admitted with rupture of membrane had a higher likelihood of success [13]. This aligns with the results in another study which found that women who had

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spontaneous ruptured membranes at admission were almost three times more likely to have successful VBAC compared to women with intact membranes at presentation [18]. Most among respondents were between 21-29 years (65.9%). Majority (79.2%) were married, and 71.7% were Christians by religion and very few (16.7%) had formal employment. Age of the mothers has been found to be one of the more important predicting factors for the success of VBAC [13]. A study in Ethiopia showed that the success rate of VBAC was higher in age group of <25 [1]. Women with advanced age are more likely to fail to VBAC. Age  $\geq$  40 years-old is also a risk for uterine rupture when women undertake TOLAC [20]. So, younger women, especially those < 35-years-old, are more likely to have a successful and safe VBAC. Another study found that the odds of having successful VBAC were nearly nine and five times higher among mothers aged less than 25 years and 25-29 years, respectively, compared to those aged  $\geq$ 30 years [22].

### CONCLUSION

This study revealed that successful vaginal delivery after one previous caesarean scar was associated with past obstetrics performance, and mainly to the current labour. The main determinants include history of stillbirth, history of successful VBAC in the past, rupture of membrane, absence of meconium, cervical stage of labour at admission, position of the presenting part, duration of labour, and knowledge of the previous indication for the past caesarean section. VBAC is a safe practice if it is offered with proper selection of candidates with high success rate factors. Physicians need to be equipped with sound knowledge of the high success rate factors detailed in the study above to efficiently counsel mothers and reduce VBAC failure rates.

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