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## PREDICTORS OF SUCCESS OF VAGINAL BIRTH AFTER PREVIOUS CESAREAN SECTION – AN ANALYSIS OF 100 CASES

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### ABSTRACT

#### **BACKGROUND**

Women eligible for vaginal birth after cesarean section (VBAC) have lower morbidity rates than women who undergo subsequent elective cesarean sections.

#### **Objective:**

To identify the obstetric parameters those influence the success of vaginal delivery in women with previous cesarean section.

#### **METHODOLOGY**

This descriptive cross sectional study was conducted at Gynaecology and Obstetrics Department of Khyber Teaching Hospital, Peshawar from 1<sup>st</sup> May 2015 to 31<sup>st</sup> April 2016. Inclusion criteria was all women of any age or parity presenting at >36 weeks gestational age, with singleton pregnancy, vertex presentation, estimated fetal weight of 2.5 -3.5kg and documented previous lower uterine segment cesarean section for a non recurrent cause. Five predictors of success of vaginal birth after previous cesarean including maternal age, gestational age, and history of vaginal delivery, onset of labor and bishop score were evaluated in each patient.

#### **RESULTS**

Out of 100 women, 64 had VBAC and 36 had cesarean section. Fifty five were booked and 45 were non booked. Total women with history of VBAC were 24, out of these 16(66%) had VBAC and 8(33%) had repeat cesarean section. Ninety three had spontaneous onset of labor whereas 7 were induced, 88 patients had Bishop score >5, out of these 61(69%) ended in VBAC and 27(30.6%) had cesarean section. The most common age group where VBAC occurred in majority was 25- 35 years. Thirty nine (61%) women had period of gestation between 38 weeks to 39 weeks+6 days. Mean maternal age was 29.42 ± 3.54 years

#### **CONCLUSION**

History of vaginal delivery, spontaneous onset of labor and Bishop score >5 are the factors which are associated with more chances of vaginal delivery after cesarean section.

#### **KEY WORDS**

Bishop Score, Elective Cesarean Section, Gestational Age, Induced Labor, Vaginal Birth After Cesarean.

#### **INTRODUCTION**

Cesarean section is the commonest obstetrical procedure performed worldwide. When used appropriately, it can improve maternal/fetal outcomes. However, when used inappropriately, the potential harm may exceed the potential benefits of cesarean section<sup>1</sup>. Its rate remained stable worldwide at under 10% until 1980s when they started to rise, reaching 30% of births in many developing countries in last decade. It is predicted that by 2020 the rate could be higher than 50%.<sup>2,3</sup>. Once a woman is delivered by cesarean, her option in subsequent pregnancy is either planned trial of labor or planned repeat cesarean section<sup>4</sup>. Women eligible for VBAC have lower morbidity rates than those who undergo elective repeat cesarean section<sup>5</sup>. A trial of labor can save them from risk of repeat cesarean<sup>6</sup>. In the long run, serious maternal morbidity increases as the number of previous cesareans increase<sup>7</sup>

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Understanding of prenatal determinants, timely intervention and proper monitoring of labor can promote VBAC<sup>8</sup> Overall; the VBAC success rate is 60-82% in published studies<sup>9</sup> In comparison to cesarean section, VBAC is associated with shorter stay in hospital<sup>10,11,12</sup>, low rates of deep venous thrombosis, enhanced mother infant bonding and lower maternal morbidity due to escape from complications of operative delivery<sup>13</sup>. On the other hand, the potential harms of VBAC include uterine rupture, risk of emergency cesarean section, perinatal mortality, hysterectomy, maternal infection and blood transfusions<sup>14,15</sup>. A planned VBAC which leads to vaginal birth is associated with less number of complications than elective repeat cesarean section but a planned VBAC which results in an emergency cesarean section is associated with more complications than an elective repeat cesarean section<sup>14</sup>. In order to assess suitability in patients with previous caesarian for successful VBAC, the current study looked at antenatal determinants like maternal age, gestational age, VBAC history, Bishop score. Assessing factors associated with successful VBAC is very important for counseling mother while offering VBAC.

## MATERIAL AND METHODS

This cross sectional study was carried out on women attending antenatal clinic of Gynae Department, Khyber Teaching Hospital, Peshawar from 1<sup>st</sup> May 2015 to 31<sup>st</sup> April 2016. It included 100 patients picked by consecutive sampling technique, who had history of previous one cesarean section. The inclusion criteria entailed all women of any age or parity with gestational age >36 weeks, singleton pregnancy, vertex presentation, documented lower uterine segment scar for a non recurrent cause and estimated fetal weight 2.5-3.5kg. The exclusion criteria consisted of dead fetus, more than one caesarean section, surgery on uterus other than caesarean, previous vertical uterine scar, cephalopelvic disproportion, malpresentation in present pregnancy, medical disorder, placenta previa and non reassuring fetal heart rate patterns. A detailed structured proforma was used as study instrument and data was collected.

Written informed consent was taken from the patients after explaining to them the purpose of study. The study was approved by institutional ethical review board. All women were admitted in the hospital on their due dates or earlier if they went into spontaneous labors. At time of admission, complete history including age, prepregnancy BMI, indication of previous caesarean section, intra or postoperative complications of previous caesarean in addition to all other details were recorded. Thorough general, per abdominal and cervical examination was done. Those failing to labor at 40 weeks were induced with only one tablet prostaglandin E2 as per unit protocol. Progress of labor was monitored by maintenance of partogram and strict fetal monitoring and the mode of delivery was seen. Five predictors of success were evaluated which included maternal age, previous successful VBAC, spontaneous onset of labor, bishop score and gestational age. All data was entered and analyzed using SPSS 20.0, and interpreted in the form of tables. Mean and standard deviation were calculated for numerical and frequency and percentages were calculated for categorical variables.

## RESULTS

A total of 100 patients were included in the study. Among the 100 women, 64 had VBAC and 36 had caesarean sections. Out of these 100, fifty five were booked patients who were already assessed antenatally, while 45 were non booked, self referrals or referrals from periphery. Amongst the 55 booked patients, 39(71%) had VBAC and 16(29%) had caesarean section. Of the unbooked patients, 25(55%) had VBAC and 20(44%) ended in caesarean section. Total women with history of VBAC were 24, out of these 24, 16(66%) had VBAC and 8(33%) had repeat caesarean section. p-value was 0.001 and this was statistically significant (Table no.I)

Table II shows that out of 100 patients studied, 12 had bishop score of less than 5, out of which 3(25%) had VBAC and 9(75%) ended in caesarean section. 88 patients had bishop score more than 5, out of which 61(69%) ended in VBAC and 27(30.6%) in LSCS. This suggests association between bishop score and mode of delivery (p-value <0.001)

Of 100 patients, 93 had spontaneous onset of labor and 7 were induced. Of those spontaneously labored, 61(65.5%) ended in VBAC and 32(34.4%) in LSCS. 7 patients were induced, 3(42.8%) had VBAC and 4(57%) ended in caesarean section. (Table no.III)

Regarding maternal age, the patients in our study were divided into three age groups. In patients less than 25 years, VBAC was seen in 18(18%) and 7(7%) ended in cesarean delivery, 38 successfully ended in VBAC in age group 25-35 years and 8 had VBAC in more than 35 years of age. Mean age was  $29.42 \pm 3.54$  years. The gestational age was found to be 38 weeks to 39 weeks +6 days in 39(61%) patients who experienced VBAC. The mean gestational age was  $39.2 \pm 0.9$  weeks.

**Table No. I. Distribution Of Patients By History Of Vbac And Mode Of Delivery.(N=100)**

History Of VBAC	Mode of Delivery			p-value
	VBAC	LSCS	Total	
Yes	16(66.6%)	8(33%)	24	0.001
No	28(36.8%)	48(63.4%)	76	
Total	64(64%)	36(36%)	100	

**Table No. II. Distribution Of Patients On Basis Of Bishop Score.(N=100)**

Bishop Score	Mode of delivery			p-value
	VBAC	LSCS	Total	
<5	3(25%)	9(75%)	12	<0.001
>5	61(69.3%)	27(30.6%)	88	
Total	64%	36%	100	

**Table No. III. Distribution Of Patients By Onset Of Labor And Mode Of Delivery.(N=100)**

Onset of Labor	Mode of Delivery			p-value
	VBAC	LSCS	Total	
Spontaneous	61(65.5%)	32(34.4%)	93	0.001
Induction	3(42.8%)	4(57%)	7	
Total	64(64%)	36(36%)	100	

## DISCUSSION

Planned VBAC is indeed a better decision for women having previous cesarean due to a non recurrent cause. Large systematic review conducted in 2010 concluded that VBAC is reasonable and safe choice for most women; however, there are specific considerations which may increase the potential harms associated with VBAC<sup>10</sup>.

We observed through our study that 64% of our study population delivered through VBAC. Of those women who had history of vaginal delivery prior to current pregnancy, 66.66% ended in successful VBAC. Macones GA et al in their study observed that those women who had no history of vaginal birth are five to seven times at risk of having cesarean section in comparison to those having previous vaginal birth<sup>16</sup>. Likewise, Maternal Fetal Medicine Unit report suggested that women with previous vaginal delivery have a success rate of 86.6% in delivering the next baby vaginally<sup>17</sup>. This finding is supported by few other international studies<sup>18,19</sup>.

Regarding the gestational age, the most prevalent gestational age group according to our study was 38 weeks to 39 weeks +6 days. Landon MB et al observed that chances of VBAC are high at 37 weeks to 40 weeks<sup>20</sup>. Another case control study found that the chances of success of VBAC increases with each increasing week after the gestational age of 37 weeks<sup>21</sup>. A retrospective cohort study of 2,755 women showed that gestational age more than 40 weeks is a risk factor for repeat cesarean section for women with previous cesarean opting for VBAC<sup>22</sup>.

In our study, the most common age group where successful VBAC was seen was 25-35 years with least success seen in more than 35 years age. Increasing maternal age is a risk factor for repeat cesarean section, this was observed by Smith GC et al in their study<sup>23</sup>. Bujold E et al and Srinivas SK et al also concluded that for women more than 35 years of age, there is more likelihood of unsuccessful trial of labor<sup>24,25</sup>.

Bishop score was a strong indicator of successful trial of labor in our study where 75% of those women with bishop score >5 ended ultimately in successful VBAC. Nighat S et al and Raja FJ et al in their studies done at Pakistan also concluded the same findings<sup>26,27</sup>. Macones GA et al reported that the success rate of VBAC increased with each centimeter increase in cervical dilatation<sup>16</sup>. McNally OM et al found that effacement of 100% had fivefold increase in likelihood of VBAC<sup>28</sup>. There were several limitations in our study. First the sample size was small. Secondly, as it was a hospital based survey so the results cannot be generalized. Thirdly, the educational status of majority of our patients and lack of awareness about the details of previous cesarean and records made it difficult for us to know about the details of previous cesarean section and its complications.

### CONCLUSION:

Previous vaginal birth, Bishop score > 5 and spontaneous onset of labor are factors associated with increased chance of successful VBAC. Increasing maternal age of >35 years and advancing gestational age of >40 weeks are risk factors for repeat cesarean section.

### RECOMMENDATIONS

Decision to perform cesarean section or trial of labor in a woman with history of previous cesarean should be based on clear, compelling and well supported justifications. The decision should be consultant laden and should be discussed with the women as facilitated decision making will enable woman to make informed decisions about their birth options.

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