

## CASE REPORT

### STUDY OF MATERNAL AND FETAL OUTCOME AND FACTORS AFFECTING SUCCESS WITH VAGINAL BIRTH AFTER CESAREAN SECTION IN TERTIARY CARE CENTRE

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**ABSTRACT:** Cesarean section must be justified only when benefits outweigh harm to the mother and fetus. The impact of Cesarean section on maternal and child health and its high cost compared with vaginal birth represent a public health problem. Cesarean section rate is increasing globally and reported to be 25-30% in recent studies. Several factors contribute to this increase, but repeat CS stands as the most relevant factor and contribute to about 29% of performed CS. One of the strategies proposed to reduce the CS rate is to increase the number of trials of labor among women who had previous one lower segment cesarean section. However, concern still remains regarding associated maternal or neonatal complications and factors that lead to success or failure of VBAC. So, we undertook this study to evaluate the factors affecting success of VBAC. **AIMS AND OBJECTIVE:** To study maternal and fetal outcomes associated with trial of vaginal birth after cesarean section and to evaluate factors associated with its success. **MATERIALS AND METHODS:** It is an Observational prospective study performed on 100 parturients in the department of OBG, in Mamata General Hospital, Khammam, Andhra Pradesh. Patients with previous one lower segment Cesarean section and a single fetus with cephalic presentation without cephalo-pelvic disproportion were included in the study. These women were given a trial for vaginal birth with observation during labor by a partogram and external fetal cardiotocography. **RESULTS:** Vaginal birth was successful in 50%. Repeat Cesarean section was done in the other 50% due to suspicious scar (62%), fetal distress (24%) and failure to progress (14%). Scar Rupture occurred in (6%), postpartum hemorrhage in (4%), neonatal incubation in (10%) and the neonatal mortality was (2%). Vaginal birth was significantly higher in the age group 20-30 years, body mass index in between 20-25, patients with prior vaginal birth, inter-pregnancy interval more than one year, previous CS done for a non-recurrent cause, parturient admitted with cervical dilatation more than 4cm, gestational age in between 37-40 weeks and birth weight of 2500-3000 gm. **CONCLUSION:** Safe vaginal birth after Cesarean section requires good antenatal care, strict selection criteria and close supervision during labor. Appropriate incubation and neonatal care are essential to decrease neonatal risks.

**KEYWORDS:** VBAC, Maternal outcome, Fetal outcome.

**INTRODUCTION:** Cesarean section (CS) must be justified only when benefits outweigh harm to the mother and fetus. The impact of CS on maternal and child health and its high cost compared with vaginal birth represent a public health problem <sup>1</sup>. Cesarean section rate is increasing globally and reported to be 25-30% in recent studies <sup>2</sup>. In developing countries, it is approximately 22% <sup>3</sup> and is one of the most challenging issues in obstetric practice. Several factors contribute to this increase, but repeat CS stands as the most relevant factor and contribute to about 29% of performed CS <sup>4</sup>.

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There is no consensus about what is the ideal rate, but recent studies re-affirm earlier WHO recommendations that the best outcome for mother and baby occur with CS rates of 5-10% and that rates above 15% seem to do more harm than good <sup>5</sup>. One of the strategies proposed to reduce the CS rate is to increase the number of trials of labor among women who had previous one lower segment cesarean section <sup>6</sup>. However, concern still remains regarding associated maternal or neonatal complications and factors that lead to success or failure of vaginal birth after cesarean section (VBAC). So, the present study was to evaluate the maternal and fetal outcomes associated with trial of VBAC and to evaluate the factors associated with its success.

**MATERIALS AND METHODS:** It is an Observational prospective study performed on 100 parturient during two years period from January 2011 to December 2012 in the Department of OBG., in Mamata General Hospital, Khammam, Andhra Pradesh. Patients with previous one lower segment Cesarean section and a single fetus with cephalic presentation without cephalo-pelvic disproportion or other absolute indications of CS were included in the study. Parturients were offered a trial of vaginal birth and were monitored by the partogram <sup>7</sup> and fetal external cardiotocography. Oxytocin augmentation was not done, and cesarean section was done for suspicious scar or fetal distress or failure to progress in labor. Suspicious scar was diagnosed by tenderness at the site of the scar associated with Fetal Heart Rate abnormalities on cardiotocography. The mode of delivery and postpartum maternal and neonatal condition were recorded. The Maternal and fetal outcome and the factors that affected success of VBAC were also noted. Data of successful vaginal birth after caesarean section and failed cases who were delivered by repeat CS were analyzed using appropriate statistical method. Result was considered significant if its P - value was  $\leq 0.05$ .

**RESULTS:** Total number of patients included were 100. VBAC was successful in 50%. Repeat CS was done in the other 50% of the patients. The common reasons for repeat CS were suspicious scar (62%), fetal distress (24%) and failure to progress (14%) (TABLE 1). Majority of the patients had normal vaginal delivery after cesarean section (76%), Scar Rupture occurred in (6%), postpartum hemorrhage in (4%), cesarean hysterectomy was done in (2%), neonatal incubation in (10%) and the neonatal mortality was found in (2%) of the patients. The maternal and fetal complications were more common among cases with failed VBAC and who were delivered by repeat CS (TABLE-II). Distribution of patients in relation to AGE: VBAC was significantly higher i.e. 60% in the age group of 20-30 years, in patients with less than 20 years and more than 30 years of age it is 24% and 16% respectively where as in repeat CS group 50% of patients were in the age group of 20-30 years and only 30% and 20% in the age groups of less than 20 years and more than 30 years respectively (p-value was  $< 0.05$ ). Distribution of patients in relation to BMI: VBAC was successful in 70% of the patients with BMI between 20-25, 20% of the patients had VBAC with BMI less than 20 and only 10% of them had VBAC with BMI more than 35 where as in repeat CS group 40% of the patients were having BMI more than 25, 30% of patients were having BMI less than 20 and another 30% were having BMI in between 20 to 25. (p-value was  $< 0.05$ ). Distribution of patients in relation to cervical dilatation on admission, in the VBAC group 70% of the patients delivered normally if the cervical dilatation was  $> 4$  cms and only 30% of patients did so with  $< 4$  cms dilatation where as in repeat CS group 80% had CS if cervical dilatation is  $< 4$  cm and only 20% had CS if it is  $> 4$  cms dilated (p-value was  $< 0.001$ ). Distribution of patients in relation to gestational age: Around 60% of the patients with

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the gestational age between 37-40 weeks had VBAC and repeat CS respectively. (TABLE-III.) OTHER FACTORS: patients who had prior vaginal birth, inter-pregnancy interval more than one year, previous CS done for a non-recurrent cause and birth weight of 2500-3000 gm. also had a successful VBAC.

**DISCUSSION:** In the present study, the overall success rate of VBAC was 50% which is lower than that reported by ship TD and colleagues <sup>8</sup> as 61.2%. Study done by Mohan and co-workers <sup>9</sup> which included hospital characteristics found significant lower rates for VBAC in regional and community hospitals compared with tertiary medical centers. In this study, the incidence of delivery by repeat CS was 50%. The commonest cause was phobia of dehiscence of the scar (62%) which revealed only three cases of actual rupture treated by repair in two patients and by caesarean hysterectomy in one patient. In our study the scar rupture was found in 6% of the patients. Ravasia and others <sup>10</sup> reported scar rupture in only 0.44%. The higher rate in our study was due to unbooked patients who were admitted late in labor and were manipulated by inexperienced traditional birth attendants outside. Fetal distress was the second cause (24%) followed by failure to progress (14%).

In a study done by Nelson <sup>11</sup> fetal distress was the commonest cause and accounted for 53% of repeat section. The incidence of neonatal incubation was 10% due to low Apgar score and prematurity. The incidence of neonatal death was 2% which was higher than that reported by Srinivas et al <sup>12</sup> which was 0.04% perinatal death for a planned VBAC. This huge gap in neonatal mortality reflects the need for improvement of the incubation and neonatal care in our hospitals. A recent study done by Obovo and colleagues <sup>13</sup> reported success in 67.4% and failure in 32.6% for VBAC, and that failed VBAC was associated with a higher incidence of maternal and fetal complications which were in most instances predictable. In the present study the age group 20-30 years had a significantly higher success rate of VBAC ( $P<0.05$ ). In a study by Nelly et al <sup>14</sup> found that patients aged 15-20 years were less likely to have a failed VBAC attempt and those women of  $\geq 35$  years were less likely to attempt VBAC and were more appropriate to have an unsuccessful trial of labor and more risk of operative complications. In this study a BMI less than 20 and more than 25 was associated with a significant lower success of VBAC ( $P<0.05$ ). Juhasz et al <sup>15</sup> reported that obesity decreases success of VBAC.

In the present study, women with a history of previous vaginal delivery had significant higher success of VBAC ( $P<0.05$ ), this result was also reported by Caughey et al <sup>16</sup> who found 92% success rate. In our study an inter delivery interval of more than one year was associated with higher success of VBAC. This result was also reported in the literature by Mehta and Colleagues <sup>17</sup> who found two to three fold increased risk of scar rupture in women with inter delivery intervals below 12-24 months. In the present study the success rate of VBAC was significantly higher when the previous CS was done for a non-recurrent cause such as Pre- Eclampsia, malpresentation, fetal distress or twins. This result was comparable with the study done by Blanchette and others <sup>18</sup> who found that a non-recurrent indication for previous CS was associated with a higher success rate of VBAC compared to recurrent indications such as cephalo-pelvic disproportion and failure to progress.

In this study, parturient admitted with cervical dilatation more than 4 cm had significant higher vaginal birth rate compared to those admitted with the cervix less than 4cm ( $P<0.001$ ). This finding agree with Martin et al <sup>19</sup> who reported that patients admitted to hospital in active labor had 54% more chance for successful vaginal delivery than those in latent phase of labor. On the contrary,

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Zelop and colleagues <sup>20</sup> found no significant association between cervical dilatation and trial of labor outcome in patients with previous CS. In our study the highest success rate of VBAC was in the gestational age group 37-40 weeks and decreased markedly thereafter. A study done by Quinones and others <sup>21</sup> found negative association between gestational age and the likelihood of VBAC. In another study done by Durnwald et al <sup>22</sup>, women who were preterm (24-36 weeks) and undergoing VBAC had higher success rate than women at term undergoing VBAC.

In the present study the birth weight group in between 2500-3000gm showed the highest success rate and this agree with the findings from a study done by Phelan et al <sup>23</sup> who found that women with birth weight more than 3000 gm. had only half the likelihood of VBAC compared with infants less than 3000 gm.

**CONCLUSION:** Vaginal birth after one CS is safe with good antenatal care, strict selection of cases and close supervision during labor by partogram and cardiotocography monitor. The phobia of scar rupture needs more confirmation to decrease unnecessary CS. Parturients with cervical dilatation less than 4 cm need patience and careful evaluation. Improvement of the incubation facilities and neonatal care are essential to decrease neonatal risks.

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CAUSE	NO. OF PATIENTS	PERCENTAGE
SUSPICIOUS SCAR	31	62%
FETAL DISTRESS	12	24%
FAILURE TO PROGRESS	07	14%
TOTAL	50	100%

**TABLE-I: DISTRIBUTION OF PATIENTS IN RELATION TO CAUSES FOR REPEAT CS (N=50)**

OUTCOME	NO. OF PATIENTS	PERCENTAGE
NORMAL VAGINAL DELIVERY	38	76%
SCAR RUPTURE	03	6%
POST PARTUM HAEMORRHAGE	02	4%
CEASAREAN HYSTERECTOMY	01	2%
NEONATAL INCUBATION	05	10%
NEONATAL DEATH	01	2%
TOTAL	50	100%

**TABLE-II DISTRIBUTION OF PATIENTS IN RELATION TO MATERNAL AND FETAL OUTCOME AFTER VBAC (N=50.)**

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AFFECTING FACTOR	VBAC (N=50)		REPEAT CS (N=50)	
	NO.	%	NO.	%
AGE (P-VALUE <0.05)				
< 20 YRS	12	24%	15	30%
20-30 YRS	30	60%	25	50%
>30 YRS	08	16%	10	20%
BMI (P-VALUE<0.05)				
<20	10	20%	15	30%
20-25	35	70%	15	30%
>25	05	10%	20	40%
CX. DILATATION (P-VALUE <0.001)				
<4 CMS	15	30%	40	80%
>4 CMS	35	70%	10	20%
GESTATIONAL AGE (P-VALUE <0.001)				
<37 WKS	06	12%	5	10%
37-40 WKS	32	64%	30	60%
>40 WKS	12	24%	15	30%

**TABLE-III: DISTRIBUTION OF PATIENTS IN RELATION TO FACTORS AFFECTING SUCCESS OR FAILURE OF VBAC (N=100, 50 PATIENTS EACH IN VBAC AND REPEAT SECTION GROUP RESPECTIVELY)**

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