Original Article

Vag Birth after CS

Vaginal Birth after Cesarean Section - A Continuing Challenge

1. Rahat N. Qureshi 2. Erum Khalid 3. Nasreen Hameed

1. Assoc. Prof. of Obs and Gynae, Aga Khan University Hospital, Karachi
2. Asstt. Prof. of Obs and Gynae, Hamdrad University Hospital, Hamdrad University Hospital, Karachi
3. Sen. Consultant Gynaecologist, CDG, Lahore

ABSTRACT

Objective: The purpose of this study was to assess the antenatal and intrapartum factors influencing the success of vaginal delivery in women with one cesarean section. Identification of modifiable risk factors which could help in developing local guidelines to improve the management and success rate of patients undergoing vaginal delivery after one previous cesarean section**.**

Study Design: Prospective cohort study

Place and Duration of Study: This study was carried out at the Department of Obstetrics and Gynecology, Aga Khan University, Hospital, Karachi from 01.01.2008 to 30.06.2008.

Materials and Methods: A sample size of 21 women, undergoing induction of labor (IOL) and 54 women with spontaneous labor were needed. All women with singleton, cephalic, term pregnancies with history of previous one caesarean section were included. Data collected through the Performa and statistical analysis performed using the SPSS computer statistics programme. To compare proportions, the χ^2 test and Fisher's exact test were used and student-t test were used to compare means.

Results: Both groups were comparable and there was no statistical difference between them, except for the Bishop score which in the induction of labor (IOL) group was 4 ± 1.54 and in the spontaneous labor group was 5.7 ± 2.18, which is statistically significant (p value = 0.001). The results suggest that there is no affect of previous vaginal delivery, epidural analgesia, fetal distress and baby's gender on the outcome of trial of labor (TOL). The rate of successful vaginal birth after cesarean section (VBAC) is not significantly different in the group of IOL and spontaneous labor.

Conclusion: The current clinical evidence suggests that VBAC is advantageous to the mother and has no adverse effects on the fetus but it is no risk free. It is actually the responsibility of the obstetrician to ensure best care and appropriate management plan.

Key Words: Cesarean section (CS), uterine rupture, trial of labor (TOL), vaginal birth after cesarean section (VBAC), induction of labor (IOL), augmentation of labor.

INTRODUCTION

Once a cesarean, always a cesarean[1], was the rule in United States of America for most of the last century. In 1980s, vaginal birth after cesarean section (VBAC) grew in popularity and the pendulum began to swing away from routine repeat elective cesarean delivery but recently, the wisdom of this transition has been questioned.

A trial of labor (TOL) after previous cesarean delivery has been accepted as a way to lower down the overall cesarean delivery rate and published evidence suggests that the benefits of VBAC outweigh the risks [2, 3, 4].

Although there is no doubt that trial of labor (TOL) is a relatively safe procedure, it is not risk free and should not be undertaken in a casual fashion. It is the decision to perform the primary cesarean section (CS) that forever alters a women reproductive performance.

The American College of Obstetrician and Gynecology has formally supported the management plan of TOL after a lower segment cesarean section and it was reflected by the significant rise in women delivering vaginally after one CS in 1993 [2].

The reluctance to permit the TOL after one lower segment CS is probably due to a variety of reasons including; fear of uterine rupture, threat of maternal and fetal damage, possible subsequent litigations, many obstetrician think that CS is simple and convenient so why accept a risk [3].

Pakistan being a developing country with poor recourses cannot afford the burden of high rate of CS. In its tertiary hospital the success rate of 64.2% has been reported and these results can be improved with proper patient selection and monitoring [5, 6, 7, 8]. Most recent studies and reviews quote VBAC success rate of 60 - 80% [9, 10].

The success rate may vary and influenced by multiple antenatal and intrapartum factors. Induction of labor (IOL) has been suggested as one of the risk factor which is associated with significantly reduced rate of successful VBAC and maternal morbidity [11, 12]. Previous vaginal delivery [13, 15], maternal age [16], maternal height [16], and fetal birth weight are significant predictors of the failure to deliver vaginally while epidural analgesia appears to have no effect on failed TOL[17]. These findings have led to an approach

illustrate the need for the re-evaluation of VBAC recommendations.

One has to accept the each delivery method has advantages and disadvantages. It is ultimately the responsibility of the obstetrician to ensure that delivery plan is appropriate for each individual.

To assess the antenatal and intrapartum risk factors influencing success of vaginal delivery in women with one cesarean section. Identification of potentially modifiable risk factors which could help in developing local guidelines to improve the management and success rate of patients undergoing vaginal delivery after one previous CS.

MATERIALS AND METHODS

A prospective cohort study was carried out in the Department of Obstetrics and Gynecology, Aga Khan University, Hospital, Karachi. Women undergoing TOL after one cesarean section were included after the approval of protocol and recruitment was stopped once the sample size achieved that is 21 women undergoing induction of labor and 54 women with spontaneous onset of labor.

Data collected through the Performa and statistical analysis performed using the SPSS computer statistics programme. To compare proportions, the χ^2 test and Fisher's exact test were used and student-t test were used to compare means. In women undergoing spontaneous TOL after one previous cesarean section, 20% higher successful vaginal delivery rate has been reported in literature as compared to ones who underwent induction of labor i.e. 77.1% v 57.9% .

At least 40 % difference in success rate of vaginal delivery would be clinically significant and that was our bases of calculating the sample size for this study.

A sample size of 21 women, underwent IOL and 54 women with spontaneous labor was needed to achieve 80% power (1-β) to detect difference of 40% in success rate of vaginal delivery in women undergoing TOL after one previous cesarean section, with 5% level of significance (α).

Singleton, cephalic, term pregnancies with history of previous one CS were included.

If type of previous CS was not known, or it was a classical cesarean section. Patients with medical disorders and obstetric complications which can influence the chances of vaginal delivery were excluded.

RESULTS

Demographic and physical characteristics of both groups were comparable and there was no statistical difference between them, except for the Bishop score which in the IOL group was 4 ± 1.54 and in the spontaneous labor group was 5.7 ± 2.18, which is statistically significant (p value = 0.001) **(Table 1)**. The mean maternal age of the IOL group was 28.38 years ± 4.37 and in the spontaneous labor group was 28.9 years ± 4.83 (p = 0.66). The mean maternal height in the IOL group and the spontaneous labor group was 155.3 cm ± 3.82 and 158.5 cm ± 4.48 respectively (p = 0.06). Mean gestational age in the IOL group and in the spontaneous labor group was 39 weeks ± 1.22 vs 38.6 ± 1.12 (p = 0.19).

Factors affecting outcome of TOL include history of previous vaginal delivery, epidural analgesia, fetal distress and baby's gender. It shows that 12 patients out of 21 in the group of IOL had the history of previous vaginal delivery, out of those 12 patients, only 10 (83.3%) delivered vaginally and 2 (16.7%) had repeat CS. Out of those 21 patients, 9 never had vaginal delivery in the past, among them 6 (66.7%) delivered vaginally and 3 (33.3%) delivered by CS (**Table 2)**. It shows that the history of vaginal delivery increases the percentage of successful vaginal delivery, but our results did not show statistically significant difference (p = 0.35). The second variable was the use of epidural analgesia. In the group of IOL, out of 21 patients, 5 took epidural analgesia and all of them delivered vaginally (100%) and 16 patients who did not take epidural analgesia, 11 (68.8%) delivered vaginally and 5 (31.2%) delivered by CS. However in the group of spontaneous labor (54 patients), 2 patients took epidural analgesia, out of which, 1 (50%) delivered vaginally and 1 (50%) underwent CS. 52 patients who did not take epidural analgesia, 37 (71.2%) delivered vaginally and 15 (28.8%) delivered by CS, but the results were not statistically significant (p = 0.21). Fetal distress and baby's gender do not appear to have any significant effect on the outcome of TOL.

Rate of successful vaginal delivery after TOL in the group of IOL and spontaneous labor was 76.2% vs. 70.4% respectively (p = 0.614) **(Table 3)**. There was no statistically significant difference in the outcome of two groups with respect to their success rate. The total duration of labor, baby's birth weight, Apgar score at one minute and at five minutes was similar.

Table No.I: Demographic and Physical Characteristics

	Induced labor n =21	**Spontaneous labor n =54**	**p value**
Total number(n)	21	54	
Maternal Age (years) (mean ±SD)	28.38 ± 4.37	28.91 ± 4.83	0.66
Maternal Height (cm) (mean ±SD)	155.3 ± 3.82	158.5 ± 4.48	0.06
Gestational age (weeks) (mean ±SD)	39 ± 1.22	38.6 ± 1.12	0.19
Bishop score (mean ±SD)	4 ± 1.54	5.7 ± 2.18	0.001*

n = number of patients * p value < 0.05 is significant
SD = standard deviation

Table No.2: Analysis of Factors Affecting Outcome of Trial of Labor

Factors	Induced labor (n = 21)		Spontaneous labor (n = 54)		P value
History of previous vaginal delivery	**Yes n (%)**	**No n (%)**	**Yes n (%)**	**No n (%)**	
Spontaneous vaginal delivery	10 (83.3)	6 (66.7)	20 (83.3)	18 (60)	0.35
Cesarean section	2 (16.7)	3 (33.3)	4 (16.7)	12 (40)	0.07
Epidural analgesia					
Spontaneous vaginal delivery	5 (100)	11 (68.8)	1 (50.0)	37 (71.2)	0.21
Cesarean section	0 (0)	5 (31.2)	1 (50.0)	15 (28.8)	0.52
Fetal distress					
Spontaneous vaginal delivery	1 (50.0)	15 (78.9)	1 (25.0)	37 (74.0)	0.42
Cesarean section	1 (50.0)	4 (21.1)	3 (75.0)	13(26.0)	0.07
Baby's gender	**Male n (%)**	**Female n (%)**	**Male n (%)**	**Female n (%)**	
Spontaneous vaginal delivery	12 (85.7)	4 (57.1)	15 (68.2)	23 (71.9)	0.18
Cesarean section	2 (14.3)	3 (42.9)	7(31.8)	9 (28.1)	0.50

n = number of patients p value < 0.05 is significant

Table No.3: Outcome of Trial of Labor

	Induced labor n (%)	Spontaneous labor n (%)	p value
N	21	54	
Spontaneous vaginal delivery	16 (76.2)	38 (70.4)	0.614
Cesarean section	5 (23.8)	16 (29.6)	
Total duration of labor (minutes)	323.2	267.8	0.11
Baby's weight (kg)	3.26	3.16	0.42
APGAR score at one minute	7.8	7.9	0.75
APGAR score at five minute	8.8	8.9	0.13

DISCUSSION

The increasing incidence of cesarean birth has focused attention on the subject of VBAC and as a result, the literature on the subject has extensively been reviewed. Many recent reports document the relative safety of a TOL as an alternative to CS, but when a trial fails the patient is at increased risk of infection, higher rates of uterine rupture, endometritis, wound infection, operative injury, hysterectomy, and maternal or fetal death.

IOL as a variable of success has had a disparate impact, with reported vaginal delivery rates ranging from 45% to 79%[11]. In 1992 Troyer and Parisi established a scoring system for VBAC success, which proved IOL to be a significant variable associated with a lower rate of vaginal delivery [10].

Many studies supports that IOL is associated with higher rate of cesarean section as compared to spontaneous labor (77.1% vs 57.9%) and uterine scar separation as compared to the elective cesarean section group (7% vs 1.5%). While this study, did not show such association [14].

The use of epidural analgesia in the presence of previous scar remains controversial. Some authors have expressed fear that it may mask the pain of uterine rupture while others have advocated its relative safety provided continuous fetal monitoring is used [77]. This study didn't show association of epidural analgesia with increased risk of CS and the risk of uterine dehiscence [17].

If a woman has not had a previous vaginal delivery, the incidence of repeat emergency CS after induction is high and the need to induce labor should be reconsidered [77]. This study didn't show the difference in success rate of two groups with or without history of previous vaginal delivery.

Most of the studies have identified different factors which affect the successful VBAC; these factors are induction of labor, previous vaginal delivery, indication of previous cesarean section, bishop score, use of epidural analgesia, fetal birth weight, maternal age, maternal height and gestational age. Some authors have concluded that in women, contemplating TOL after previous cesarean section, there is less chance of successful vaginal delivery if; at the index pregnancy, oxytocin is used, contractions last longer than 12 hours, or cervical dilatation progressed slowly [58, 66], but this study has failed to show their association with the outcome. We accept that the small numbers in the studied subgroups limits its power to draw significant conclusions. Therefore studying a larger group would help draw more significant results.

A TOL after previous CS has been accepted as a way to lower down the overall CS rate and published evidence suggests that the benefits of VBAC outweigh the risks.

The stimulus for the interest in VBAC was the progressive rise in CS rate. The current clinical evidence suggests that VBAC is advantageous to the mother and has no adverse effects on the fetus. Although there is no doubt that TOL is a relatively safe procedure, it is not risk free and should not be undertaken in a casual fashion.

CONCLUSION

This study is concluded by saying that there is no affect of previous vaginal delivery, epidural analgesia, fetal distress and baby's gender on the outcome of TOL. The rate of successful VBAC is not significantly different in the group of IOL and spontaneous labor. The IOL does not result in increased risk of failure to deliver vaginally, as compare to the women presenting in spontaneous labor.

REFERENCES

1. Flamm BL. Once a cesarean, always a controversy. Obstet Gynecol 1997; 90:312-315.
2. Joan M, Mastrobattista M. Vaginal birth after cesarean delivery. Obstet Gynecol Clin North Am 1999;26:295-305.
3. Joke MJ, Diana MR, Maria P, Gouke JB, Martine E, Hans JW, et al. Vaginal birth after cesarean section in a population with a low over all cesarean section rate. Eur J Obstet Gynaecol Reprod Biol 2001;96:158-62.
4. Rageth J, Juzi C, Grossen BH. Delivery after previous cesarean section: a risk evaluation. Obstet Gynecol 1999;93: 332-7.
5. Perveen F, Shah Q. Obstetric outcome after one previous cesarean section. J Obstet Gynecol Res 1997;23: 341-6.
6. Jamelle RN. Outcome of unplanned vaginal deliveries after two previous caesarean sections. J Obstet Gynecol Res 1996;22: 431-6.
7. Khan KS, Rizvi A, Rizvi JH. Risk of uterine rupture after the partographic alert line is crossed – and additional dimension is the quest towards safe motherhood in labor following caesarean section. J Pak Med Assoc 1996; 46: 120-2.
8. Khan KS, Rizvi A. The Partograph in the management labor following caesarean section. Int J Gynecol Obstet 1995; 50: 151-7.
9. Mc Mahon MJ, Luther ER, Bowes WA, Olshan AF. Comparison of a trial of labor with an elective second cesarean section. N Eng J Med 1996;335: 689-95.
10. Weinstein D, Benshushan A, Tanos V, Zilberstein R, Rojansky N. Predictive scores for vaginal birth after cesarean section. Am J Obstet Gynecol 1996; 174: 192-8.
11. Sims E, Newman RB, Hulsey TC. Vaginal birth after caesarean: to induce or not to induce. Am J Obstet Gynecol 2001; 184: 1122-4.
12. Rochelle ML, Hort VL, Easterling TR, Martin DP. Risk of uterine rupture during labor among women with a prior cesarean delivery. N Engl J Med 2001; 345: 3-8.
13. Adjahoto EO, Ekouevi DK, Hodonou KA. Factors predicting outcome of trial of labor after previous cesarean section in a developing country. J Gynecol Obstet Biol Reprod 2001; 30:174-9.
14. Gregory KD, Korst LM, Cane P, Platt LD, Kahn K. Vaginal birth after cesarean and uterine rupture ratesin California.Obstet Gynecol 1999;94:985-89.
15. Heija H, Rasheed A, El-Qaran O. Effect of age and parity on primary cesarean section rates. Clin Exp Obstet Gynecol 1998; 25: 38-9.
16. Rosenthal AN, Paterson BS. Is there an incremental rise in the risk of obstetric intervention with an increasing maternal age.Br J Obstet Gynecol 1998; 105: 1064-9.
17. Sakala EP, Kaye S, Murray RD, Munson LJ.Epidural analgesia: effect on the likelihood of a successful trial of labor after cesarean section. J Reprod Med 1990; 35: 886-90.
18. McNally OM, Turner MJ. Induction of labor after 1 previous Caesarean section. Aust N Z J Obstet Gynaecol 1999; 39:425–429.
19. Ellice Lieberman. Risk factors for uterine rupture during a trial of labor after cesarean. Clinical Obstet and Gynecol 2001; 44:609-621
20. Shipp T, Zelop C, Repke JT, et al. Maternal age as a predictor of symptomatic uterine rupture during a trial of labor after previous cesarean delivery. Am J Obstet Gynecol 2001; 184:S71.

Address for Corresponding Author:
Dr. Erum Khalid
Assistant Professor
Department of Obs and Gynae,
Hamdrad University Hospital,
(Taj Medical Complex), M. A. Jinnah Road
E-mail - erum.khalid@hotmail.com
Mobile phone number – 0345 2061841