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Maternal and perinatal effects of vaginal delivery after caesarean section

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Abstract
We aimed to determine the risk factors of vaginal delivery after caesarean section (VDAC) that may be effective on maternal and neonatal outcomes and compare the pregnancy outcomes of VDAC with the results of the previous caesarean delivery. 36 women, who had VDAC in Dr. Zekai Tahir Burak Women's Health Education and Research Hospital between 2009-2014 years, were included in this study. Mean age of patients was 32.53± 3.595, mean birth week of previous caesarean was 38.21 ± 1.84 and mean birth week of present vaginal delivery was 36,10 ± 3,99. Birth weeks of previous caesarean and present vaginal deliveries were significantly different. Neonatal birth weight was not significantly different between these groups. Gravida and parity of the patient, and the number of previous vaginal deliveries, have been identified as factors that reduce adverse pregnancy outcomes by lineer regression analysis. Increased number of previous vaginal deliveries, gravida and parity reduce the adverse pregnancy outcomes in women having VDAC.

Keywords: Vaginal delivery after cesarean, caesarean, maternal and perinatal complications

Introduction

Caesarean rates have been increasing in many countries [1]. 32.8% of whole deliveries have been reported to happen with caesarean, between the years 2007- 2010 [2]. In Turkey, this rate was 36.7 % for the year 2008 [3,4]. In the European Union, vaginal delivery after caesarean (VDAC) rates are significantly lower in Germany, Ireland, and Italy (29% to 36%), than those in Finland, Netherlands, and Sweden (45% to 55%) [5]. When compared to normal vaginal delivery, delivery with caesarean has higher risks in maternal morbidity and mortality [6]. In recurrent operations, difficulty in abdominal dissection due to the previous surgical adhesions, increased risk of injury to urinary bladder and bowel, prolonged operation time, increased blood loss and complications due to plasental adhesion anomalies are seen [7]. Because of the risk of increased complications; VDAC has been recommended more. In 1990, VDAC incidence was 19.9% worldwide; whereas in 1996, it was 28.3%, with the help of favoring to decrease operative complications [8]. National Institute of Health (NIH), reported that caesarean rates must be decreased below 15% to minimize the complication risks [9]. VDAC must be recommended to the patients, in centers having suitable equipment and staff for urgent operations and neonatal care, to lower the perinatal and maternal morbidity and mortality, in case of uterine rupture [10].

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According to American College of Obstetricians and Gynecologists (ACOG), all of the VDAC recommended patients must be informed about the perinatal and maternal risks like uterine rupture, hysterectomy and blood transfusion and must give informed consents. The patients must be chosen among the ones who had previous operation with lower segment transverse insicion without any complications and who do not have any contraindications for vaginal delivery [11]. VDAC is contraindicated for the women who had classic or T shaped incision for the previous caesarean; who had a history of uterine rupture, or a cavity related operation like myomectomy or hysterotomy; who have placenta previa or malpresented fetus [12]. The success rate of VDAC is 60-80%. This wide range is due to many factors like, having previous vaginal delivery, the spontaneous starting of the contractions; age of the mother, obesity, the time interval between the pregnancies and the indication of the previous surgery [13].

We compared the previous and present pregnancy outcomes of our patients who had VDAC in our clinic; and aimed to determine the risk factors effective on adverse maternal and neonatal results.

Materials and Methods

The pregnants, who had VDAC in Dr. Zekai Tahir Burak Women's Health Education and Research Hospital between the years 2009 and 2014 were included in the study. The 36 patients of the research were examined retrospectively. All of the patients admitted to the hospital

after the start of the labor. Singleton pregnancies having vertex presentation and no urgent fetal or maternal indication for previous caesarean were included. Multiple gestations and previable preterm labors were excluded. Complete blood counts (hemoglobin level, white blood cell count, trombocyte count), and biochemical parameters of the patients at the beginning of the hospitalization were analysed. The correct gestational week for all of the patients were calculated with CRL measurements of the first trimester. The fetal biometric measures and amniotic fluid indices for all cases were recorded. All of the patients were monitorized continuously for maternal and fetal well-being, to determine any hemodynamic changes resembling uterine rupture, intraabdominal or vaginal bleeding in the active phases of the labor. No augmentation was applied and spontaneous process of the labor for each patient was observed. All of the patients having present vaginal delivery were controlled with ultrasonography after the delivery. The local ethical committee approved the study.

7 of the patients (19.44%) having present vaginal delivery, had at least one previous caesarean delivery. None of them had uterine rupture. All of the patients were accepted to be in the active stage of the labor due to the presence of the contractions in the nonstress test or membrane rupture. Among 36 women having present vaginal delivery, only one of them had separation difficulty of the placenta, even medical therapy was used. After that, the absence of placental insertion abnormality was excluded via ultrasound examination, and the placenta was removed manually, under general anesthesia. During the hospitalization process of this patient; neither abnormal vaginal bleeding nor any problem in the vital signs of the patient was observed. Two other patients had some abnormal, active vaginal bleeding after delivery. Neither any clots nor placental residual tissues were observed within the uterine cavity in these patients. There was not any ultrasonographic sign of intraabdominal bleeding or rupture of the previous surgical incision of the uterus. Also, there was not any vaginal laserations. Uterotonic medication was applied to these patients, which resulted in cessation of vaginal bleeding. These two patients received blood transfusion. Another patient had continous bleeding after delivery and uterine dehissance was observed in the laparatomy. After the repair of the defect and the blood transfusion, the patient did not have any other problem during her hospitalization.

Statistical Analyses

The data of the study was analyzed with SPSS-17 (SPSS Inc., Chicago, IL, United States). Mean of the variables (with 95% confidency interval), number of the cases and percentage values were used in data. Nominal data was analyzed with Pearson's chi-square test. Linear regression analyses were used to evaluate the risk factors associated with the adverse pregnancy outcomes (need for neonatal intensive care unit, Apgar score below 7, blood transfusion need for the mother, operational complications like uterine dehissance, intraabdominal organ laserations, bleeding), with 95% confidency interal. The results having p value less than 0.05 was accepted as significant.

Results

36 women who had VDAC were included in the study. The mean age of the women in their previous caesarean deliveries was 29.21 ± 3.44; and it was 32.58 ± 3,595 in the VDAC. The mean delivery week with previous cesarean was 38.21 ± 1.84 and it was 36.10 ± 3.99 for present vaginal delivery (Table 1). There was a significant difference in delivery weeks of previous cesarean and present vaginal delivery (p=0.044) (Table 1 and Figure 1).

Table 1. Demographic and laboratory parameters of the patients

	PREVIOUS CAESAREAN	PRESENT VAGİNAL DELİVERY (VBAC)	p value
Age (year)	29.21 ± 3.44	32.58 ± 3.595	**0.006**
Gravidy	2 [1-3]	3 [2-5]	**<0.001**
Parity	1 [0-3]	2 [1-3]	**<0.001**
Birth Week	38.21 ± 1.84	36.10 ± 3.99	**0.044**
Birth Weight (g)	2983.68 ± 615.93	2493.16 ± 952.51	0.068
Apgar 1/5 (minute)	7 [6-7]/ 9 [8-9]	6 [0-7] / 7 [0-9]	**0.048**
Hemoglobin (g/dl)	11.99 ± 1.03	12.01 ± 1.37	0.955
Thrombocyte	206.95 ± 41.22	223.00 ± 86.37	0.469
White blood cell count (WBC)	99.81 ± 26.87	10.433 ± 3.388	0.120
AST (u/L)	15.68 ± 5.78	18.63 ± 5.62	0.652
ALT (u/L)	11.21 ± 3.13	12.00 ± 4.19	0.515

Independent simple t test, mean ± sd [min-max]. p value; istatistiksel anlamlılık değeri, p< 0.05 istatistiksel olarak anlamlı, g; gram

The mean neonatal birth weight of the infants born with previous cesarean was 2983.68 ± 615.93 g and it was 2493.16 ± 952.51 g for the infants born with present vaginal delivery. There was not a significant difference in neonatal birth weights of the two groups (p=0.068) (Table 1).

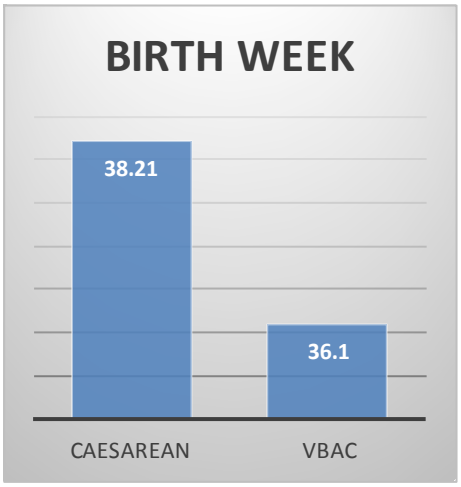

Figure 1. Comparison of the delivery weeks of Previous Caesarean and Present Vaginal Delivery (VDAC)

There was not a significant difference in hemoglobin, thrombocyte, white blood cell count (WBC), alanin aminotransferase (ALT), and aspartatte aminotransferase (AST) levels of the patients, when their previous caesarean delivery results were compared with the results of present VDAC (Table 1). The mean time for present vaginal delivery was 2 years. The number of vaginal deliveries before the previous caesarean delivery varied between 0 and 2. The mean hospitalization period for the patients having VDAC was 4 days.

Linear regression model was used to evaluate the adverse pregnancy outcomes of the patients having VDAC. Neonatal intensive care unit admission, APGAR score less than 7 in 5 minutes after delivery, maternal need for blood transfusion, complications like uterine dehissance, injury to urinary bladder or other intraabdominal organs, excessive bleeding were the criteria for the adverse pregnancy outcomes.

Gravidy, parity and the time of the previous vaginal delivery were found to be the risk factors effective on adverse pregnancy outcomes, in patients having VDAC; beta coefficients were -0.667, -0.531 and -0.519, respectively. These results were statistically significant (p=0.002, p=0.019 and p=0.023 respectively) (Table 2).

Table 2. Lineer regression analyses of risk factors effective on adverse pregnancy outcomes

Model	Unstandardized Coefficients		Standardized Coefficients	t	p value
	B	Std. Error	Beta		
Age (year)	-.032	.031	-.242	-1.028	.319
Gravidy (n)	-.340	.092	-.667	-3.689	**.002**
Parity (n)	-,305	.118	-.531	-2.582	**.019**
Week of previous caesarean	.094	.059	.362	1.601	.128
Week of Present Vaginal Delivery (VDAC)	-.075	.023	-.629	-3.339	.004
Neonatal birth weight (g)	-8.231	.000	-.106	-.440	.665
Time period between previous caesarean and VDAC (year)	-.110	.071	-.350	-1.541	.142
The number of previous normal deliveries (n)	-.500	.200	-.519	-2.503	**.023**
Time for maternal hospitalization (days)	.076	.077	.231	.981	.340
Delivery period (minutes)	.002	.003	.132	.550	.589

Discussion

VDAC rates has been increased to decrease delivery with caesarean, with the help of the recommendations of NIH [8]. Appropriate patient selection is crucial because of the risk for uterine rupture; which is the most dangerous maternal complication during VDAC [11]. The incidence of uterine rupture varies between 1-2% [11]. The risks for neonatal ventilation with mask; amniotic fluid with meconium and neonatal sepsis increases in VDAC [13]. Attempts of VDAC are more successful in patients who had previous vaginal delivery; and whose contractions started spontaneously [14]. 7 of the patients (19.44%) of this study had vaginal delivery before. All of the patients were in active stages of labor and were pregnant for singleton vertex presented fetuses.

Increased gravidy, parity and previous vaginal delivery count were observed to be the factors decreasing adverse pregnancy outcomes. No relationship was present between maternal age, the week of caesarean delivery, the week of present vaginal delivery and the neonatal birth weights of the groups with the adverse pregnancy outcomes. Ashwal et al. [15] evaluated the factors effecting the success of VDAC in 1767 pregnant women who had previous caesarean section with lower segment transverse incision. 1563 of the patients (88.5%) had VDAC and 204 of them (11.5%) were not successful in vaginal delivery. In this study, gravidy, parity and presence of previous vaginal delivery were found to be significantly increased in the patients who succeeded in VDAC. Maternal and gestational age and the neonatal birth weight were not related to the success of VDAC. Also, they reported that the chance of women who did not have any previous vaginal delivery was only 55%, in the attempt of a VDAC. Durnwald et al.[16] studied 768 women; VDAC was experimented in 522 of them and it was achieved in 344 of them (66%). 246 women had elective caesarean delivery. 4

of 522 (0.8%) had uterine rupture. No maternal or neonatal complications were reported. The researchers stated that VDAC was more successful in the patients who had cervical effacement more than 45% and who had fetal vertex position in minus one level or lower. Another study reported that emergency caesarean risk was higher for the patients who did not have any previous vaginal delivery, whose gestational weeks were beyond 40 weeks, whose labors were induced with prostoglandins, and who were older [17]. Uterine rupture and perinatal mortality ratios were also higher in the patients who had emergency caesarean deliveries. Every patient in an attempt of VDAC, must be monitorized continously for fetal bradicardia which is the first sign of the uterine rupture in 70 % of the cases, to decrease perinatal mortality [10]. There was not any uterine rupture in our cases. All of the patients had continous maternal and fetal monitorization. Blood transfusion was applied to 3 (8.33%) patients in total; one of which had laparatomy due to uterine dehissance.

A difference of two weeks in the mean delivery times in previous caesarean and present vaginal delivery was observed in our study. The mean birth weight of newborns born with VDAC was lower than the mean birth weight of newborns, born with previous caesarean section of the same mothers. But this result was not statistically significant due the limitation in patient count. The success rate of VDAC was reported to be higher with the newborns whose weights were less than 4000g, when compared to ones heavier than 4000g. The risk of uterine rupture was not different between these groups [18].

Conclusion

Increased gravidy and parity and previous vaginal delivery were observed to decrease the adverse pregnancy outcomes. The patients who will try VDAC, must be chosen appropriately and be informed about all the risks and the complications of the process. An informed consent must be obtained. Besides, all of the patients must be monitorized both for the fetus and the mother continously during labor and the stuff must be ready for emergency caesarean section, at most in 30 minutes [19].

The few number of patients and including only the patients in active stage of labor in the attempt of VDAC are the limits of our study.

References

1. Ezechi OC, Fasubaa OB, Obiesie LO, Kalu BK, Loto OM, Dubub VI, Olomola O. Delivery outside hospital after antenatal care: prevalence and its predictors. J Obstet Gynaecol. 2004;24(7):745-9.
2. Development OfECa. OECD health data 2007:statistics and indicators for 30 countries 2007. 6;30-2009; http://www.oecd.org/document/30/0,2340, Accessed Dec 16, 2009.
3. Makoha FW, Felimban HM, Fathuddien MA, Roomi F, Ghabra T. Multiple cesarean section morbidity. Int J Gynaecol Obstet. 2004;87(3):227-32.
4. Agency for Healthcare Research and Quality. Healthcare Cost and Utilization Project (HCUP). http://hcupnet.ahrq.gov/. Accessed Dec 9, 2009.
5. http://www.hips.hacettepe.edu.tr/TNSA2008-AnaRapor.pdf Access date 20.01.2016
6. Menacker F, Declercq E, Macdorman MF. Cesarean delivery: background, trends, and epidemiology. Semin Perinatol. 2006;30(5):235-41.
7. Healthy People 2010. http://www.healthypeople.gov/. Access date 4.12.2009.
8. Lavender T, Hofmeyr GJ, Neilson JP, Kingdon C, Gyte GM. Cesarean section for non-medical reasons at term. Cochrane Database Syst Rev. 2012;3:CD004660.
9. Sachs BP, Kobelin C, Castro MA, Frigoletto F. The risks of lowering the cesarean-delivery rate. N Engl J Med. 1999;340(1):54-7.
10. American College of Obstetricians and Gynecologists. ACOG Practice bulletin no. 115: Vaginal birth after previous cesarean delivery. Obstet Gynecol. 2010;116(2 Pt 1):450-63.
11. Hill JB, Ammons A, Chauhan SP. Vaginal birth after cesarean delivery: comparison of ACOG practice bulletin with other national guidelines. Clin Obstet Gynecol. 2012;55(4):969-77.
12. Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu RR, Janik R, Nygren P, Walker M, McDonagh M. Vaginal birth after cesarean: new insights. Evid Rep Technol Assess (Full Rep). 2010;(191):1-397.
13. Cox KJ. Providers' perspectives on the vaginal birth after cesarean guidelines in Florida, United States: a qualitative study. BMC Pregnancy Childbirth. 2011;11:72.
14. Celeste P Durnwalda, Brian M Mercera. Vaginal birth after Cesarean delivery: predicting success, risks of failure. J Matern Fetal Neonatal Med. 2004;15(6):388-93.
15. Ashwal E, Wertheimer A, Aviram A, Wiznitzer A, Yogev Y Hiersch L. Prediction of successful trial of labor after cesarean - the benefit of prior vaginal delivery. J Matern Fetal Neonatal Med. 2015;20:1-6.
16. Zelop CM, Shipp TD, Repke JT, Cohen A, Lieberman E. Outcomes of trial of labor following previous cesarean delivery among women with fetuses weighing >4000 g. Am J Obstet Gynecol. 2001;185(4):903-5.
17. Smith GC, White IR, Pell JP, Dobbie R. Predicting cesarean section and uterine rupture among women attempting vaginal birth after prior cesarean section. PLoS Med. 2005;2(9):e252.
18. American College of Obstetricians and Gynecologists. ACOG Committee Opinion no. 256: Committee on Obstetric Practice. Optimal goals for anesthesia care in obstetrics. Obstet Gynecol. 2001;97(5 Pt 1):suppl 1-3.
19. Sentilhes L, Vayssière C, Beucher G, Deneux-Tharaux C, Deruelle P, Diemunsch P, Gallot D, Haumonté JB, Heimann S, Kayem G, Lopez E, Parant O, Schmitz T, Sellier Y, Rozenberg P, d'Ercole C. Delivery for women with a previous cesarean: guidelines for clinical practice from the French College of Gynecologists and Obstetricians (CNGOF). Eur J Obstet Gynecol Reprod Biol. 2013;170(1):25-32.