Experimental
&
Clinical Article

Antepartum Risk Factors for Peripartum Hysterectomy in Women with Placenta Previa

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OBJECTIVE: The aim of the present study was to identify the antepartum risk factors for peripartum hysterectomy in women with placenta previa.

STUDY DESIGN: The medical records of 57 women, who underwent cesarean because of placenta previa during the period January 2006-January 2013, were reviewed retrospectively. Antepartum characteristics of women who did and did not undergo peripartum hysterectomy were compared.

RESULTS: Among the 57 cases with placenta previa, peripartum hysterectomy was required in 6 (10.5%) women. A statistically increased risk emerged for a history of repeated cesarean delivery (p=0.045), placental adhesive disorders (p<0.001), and an estimated blood loss ≥2000 ml (p<0.001).

CONCLUSION: The present study confirmed placenta previa is a condition for a substantial risk of peripartum emergent hysterectomy. An increasing number that of previous cesareans, placental adhesive disorders and blood loss ≥2000 ml were found to be associated with the risk. Antepartum evaluation of adhesive disorders with imaging studies may play a crucial role in predicting hysterectomy in these cases.

Key Words: Placenta previa, Peripartum, Hysterectomy

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Introduction

Placenta previa is a demanding clinical condition in which the placenta lies in the lower uterine segment, completely or partially obstructing the internal ostium of the cervix. It is one of the leading causes of second and third trimester bleeding which may cause serious mortality and morbidity for both the fetus and the mother.[1] The prevalence of placenta previa is reported to be about 0.28-1.5%.[1-4]

Peripartum hysterectomy, a surgical procedure performed at the time of delivery or in the immediate postpartum period, although a rare event, is associated with increased morbidity and mortality.[5] The women with placenta previa are particularly at an increased risk for peripartum hysterectomy[6-7] usually performed due to uncontrolled bleeding; whose obvious result is the loss of future fertility. The need for hysterectomy is significantly enhanced in women with placenta previa with a relative risk of 30-40.[8-9] Thus, it is important to clearly identify the risk factors for peripartum hysterectomy, so that women at high risk may be referred and counseled properly.

The present study was designed to identify the antepartum risk factors associated with peripartum cesarean hysterectomy in women with placenta previa who underwent cesarean.

Material and Method

The design of the present study was approved by the Ethical Committee and Institutional Review Board of Adnan Menderes University Faculty of Medicine, where the study was conducted.

Data referred to the period from January 2006 to January 2013. We selected pregnancies with a diagnosis of placenta previa. We exclusively included women delivering after 24 weeks gestation. Medical records were reviewed for demographic characteristics including age, body mass index, previous deliveries, history of dilatation and curettage, and gestational age at delivery, previous previa, placental localization and antepartum bleeding. A total previa was defined when the internal cervical os was completely covered by the placenta. Partial and marginal placenta previa were defined when the in-

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ternal cervical os was partially covered by the placenta and when the placenta enriched onto the margin of the internal cervical os without covering it, respectively. Data for peripartum events including planned and emergent surgery, estimated blood loss, number of blood unit transfused, placental adhesive disorders were documented. Adhesive disorders were defined as the invasion of chorionic villi into the myometrium such as placenta accreta and increta according to the histological examination of the resected uterus from those who underwent hysterectomy. All of the women diagnosed placenta previa were planned to be operated at 37-38 weeks' gestation. Persistent severe bleeding was an indication for emergent cesarean section. Women estimated at higher risk of premature delivery received betamethasone 6 mg intramuscular injection daily for two days at 30-32 weeks gestation. At the time of surgery, oxytocin 10 IU iv. was systematically administered following extraction of the fetus. 40-60 further units were given in continuous intra venous infusion if hemostasis was not achieved. Concomitantly to drug administration, bimanual compression was systematically carried out. Total hysterectomy was considered if hemostasis was not achieved yet. Peripartum hysterectomy was defined as cesarean hysterectomy or hysterectomy performed 24 h or less after delivery.

Data analyses were performed by using SPSS for Windows, version 11.5 (SPSS Inc., Chicago, IL, United States). Whether the distributions of continuous and metric discrete variables were normally or not was determined by Kolmogorov Smirnov test. Continuous and metric discrete variables were shown as mean ± standard deviation (SD) or median (minimum-maximum), where applicable. Categorical data were expressed as number of cases and (%). While, the mean differences between groups were compared by Student's t test, otherwise, Mann Whitney U test was applied for comparisons of the median values. Categorical data were analyzed by Pearson's Chi-square or Fisher's exact test, where appropriate. Multiple Logistic Regression Analyses with Backward LR procedure were performed for determining the best predictor(s) which effect on estimated blood loss. Any variable whose univariable test had a p value <0.25 was accepted as a candidate for the multivariable model along with all variables of known clinical importance. Odds ratios, 95% confidence intervals for each independent variable were also calculated. A p value less than 0.05 was considered statistically significant.

Results

In this period a total of 57 patients underwent cesarean because of placenta previa. 6 (10.5%) women underwent peripartum hysterectomy. Decision of hysterectomy was never definitely taken before surgery. Only one case was a twin pregnancy and only one woman smoked. 31 (54.4%) women had at least one cesarean delivery before. Majority of the operations (66.6%) were performed in elective conditions. There was no maternal mortality in the intra- or postoperative period. Transfusion was needed in 29 (50.8%) cases during and/or after operation. Histopathologically there were 4 adhesive disorders; the diagnosis was placenta accreta in one case and placenta increta in 3 cases that underwent hysterectomy. None of the women had previous previa. Table 1 shows the surgical characteristics of women operated for placenta previa.

Table 1: Surgical characteristics of women operated for placenta previa

Characteristics	Number (%)
Indication for cesarean	57 (100)
Elective	38 (66.6)
Emergent for vaginal bleeding	14 (24.6)
Emergent for preterm labor/PROM	2 (3.5)
Emergent for fetal oligohydramnios/fetal distress	3 (5.3)
Blood loss (ml)	
<1000	35 (61.4)
1000-1999	11 (19.3)
≥2000	11 (19.3)
Blood/plasma transfusion	29 (50.8)

PROM: Premature rupture of membranes

Comparison between women who did and did not undergo peripartum hysterectomy is shown in table 2. Although a history of cesarean section and D/C (dilatation/curettage) and total previa were found to be higher in the hysterectomy group, the difference was not statistically significant. However, increasing number of cesarean was significantly higher in women underwent hysterectomy (p=0.045). In addition, a statistically significant difference emerged for adhesive disorders (p<0.001), estimated blood loss (p<0.001) and number of units transfused (p<0.001).

Considering the blood loss, Logistic Regression Analyses were performed for determining the best predictor(s) which effect on blood loss, thus hysterectomy. A history of previous cesarean, increasing number of cesarean sections, and total previa were found to be the factors associated with an estimated blood loss of >1000 ml. The ORs for a history of previous cesarean, increasing number of cesarean sections and total previa were 0.02 (95%CI 0.001-0.842, p=0.04), 36.92 (95%CI 2.07-657.30, p=0.014) and 15.14 (95%CI 1.64-139.42, p=0.016), respectively.

Table 2: Demographic and clinical characteristics of women with placenta previa

Characteristics	Conservative surgery (n=51)	Hysterectomy (n=6)	p
Age (years)	30.2±4.7	31.3±1.4	0.210
BMI (kg/m²)	26.7±1.6	26.8±0.7	0.827
Previous D/C	0 (0-3)	1 (0-5)	0.100
Multiparity	41 (80.4%)	5 (83.3%)	1.000
Previous C/S	26 (51.0%)	5 (83.3%)	0.205
Number of previous C/S	1 (0-2)	1.5 (0-3)	**0.045**
Indication for C/S			1.000
Emergent	17 (33.3%)	2 (33.3%)	
Elective	34 (66.7%)	4 (66.7%)	
Gestational week	37 (25-39)	37.5 (28-38)	0.313
Systemic disease*	3 (5.0%)	0 (0.0%)	1.000
Obstetric complication**	10 (19.6%)	1 (16.7%)	1.000
Placental localization			
Anterior	24 (47.1%)	4 (66.7%)	0.423
Posterior	15 (29.4%)	1 (16.7%)	0.665
Right side	2 (3.9%)	1 (16.7%)	0.288
Left side	10 (19.6%)	0 (0.0%)	0.577
Placenta previa			
Total	28 (24.9%)	6 (100.0%)	0.071
Partial	5 (9.8%)	0 (0.0%)	1.000
Marginal	18 (35.3%)	0 (0.0%)	0.162
Adhesive disorder	0 (0.0%)	4 (66.6%)	**<0.001**
Transfusion (unit)	0 (0-5)	7.5 (4-12)	**<0.001**
Erythrocyte suspension	0 (0-3)	4 (4-6)	**<0.001**
Fresh frozen plasma	0 (0-2)	3.5 (0-6)	**<0.001**
Estimated blood loss (ml)			
<1000	35 (68.6%)	0 (0.0%)	**0.002**
1000-1999	11 (21.6)	0 (0.0%)	0.584
≥2000	5 (9.8%)	6 (100.0%)	**<0.001**

*BMI: Body mass index, D/Dilatation and curettage, C/Cesarean, *2 hypothyroidism, 1 type 2 diabetes mellitus, **4 oligohydramnios, 3 gestational diabetes, 2 polyhydramnios, 1 intrauterine growth restriction, 1 twin pregnancy*

Discussion

The data of the present study demonstrated that, the peripartum cesarean hysterectomy rate for women with placenta previa was 10.5%. This rate is similar to the early reports demonstrating 4.9% to 10.6%.[2,7,10-11] Major complications of peripartum hysterectomy are increased blood loss, need for blood transfusion, surgical injuries and even mortality. We also found a higher estimated blood loss and a higher need for blood transfusion in women who underwent peripartum cesarean hysterectomy.

The purpose of the present study was to identify the antenatal risk factors associated with peripartum cesarean hysterectomy in women with placenta previa. Our data showed that factors predictive of the need for peripartum hysterectomy in women with placenta previa included an increasing number of previous cesareans, placental adhesive disorders such as placenta accreta and increta and blood loss ≥2000 ml. Crane et al.[2] stated that risk factors for need of hysterectomy in women with placenta previa include the presence of placenta accreta and previous cesarean delivery. Choi et al.[7] found peripartum hysterectomy rate 9% in 346 women with placenta previa and they concluded that history of abortion, previous cesarean and total previa were strong antepartum risk factors for peripartum hysterectomy. The study conducted by Ossola et al.[9] confirmed the detrimental role of major placenta previa (partial and complete placenta previa) in influencing the risk of postpartum hysterectomy, but also suggested multiple pregnancy and surgical abortion as potential additional risk factors. Giambattista et al.[10] mentioned that a history of cesarean section, major placenta previa, the sonographic suspect of placenta accreta and gestational age at delivery <34 weeks' ges-

tation were independently associated with the risk of peripartum hysterectomy. Yaegashi et al.[11] also reported that the combination of prior cesarean section and placenta previa is an especially ominous risk factor for emergency postpartum hysterectomy and life-threatening bleeding following placental removal. In the retrospective study reported by Frederiksen et al.[12] previous cesarean and general anesthesia were found to be the factors which increased the intraoperative blood loss and the need for transfusion, but only prior cesarean was found to be a predictor of the need for hysterectomy. Silver et al.,[13] in a 2006 Maternal Fetal Medicine Units Network study, found the risk of hysterectomy increased only in women with three or more previous cesarean births. Similar to the data of the aforementioned studies we also found an increasing number of previous cesareans, placental adhesive disorders such as placenta accreta and increta and blood loss ≥2000 ml to be the predictive risk factors for peripartum hysterectomy in women with placenta previa. In addition, previous cesarean section and total previa were found to be higher in the hysterectomy group compared to conservative surgery group (83.3% versus 51% and 100% versus 24.9%, respectively) but the difference was not significant in our study. Furthermore we investigated the risk factors affecting blood loss, thus hysterectomy. A history of previous cesarean, increasing number of cesarean sections, and total previa were found to be the factors associated with an estimated blood loss of >1000 ml. Discrepant findings among published studies may be attributed to the different sample size, study design and the study populations.

As the adhesive disorders such as placenta accreta and increta were found to be one of the predictive factors for the need of peripartum hysterectomy in most of the published studies,[2,10] antepartum evaluation of adhesive disorders with imaging studies may play a crucial role in predicting hysterectomy in these cases. A suspect of placenta accreta based on the sonographic data such as the presence of placenta lacunae and the color Doppler imaging within these lacunae, the loss of the retro placental clear space and myometrial thickness could be drawn.[10] Indeed, some data suggesting that magnetic resonance (MR) imaging may also be accurate in identifying placenta accreta.[14] The information obtained at antenatal period, including the location, the extent and the depth of myometrial invasion may be helpful to the patient and the clinician in arriving at an informed choice of management strategy.

The retrospective design and the small sample size may be considered as the limitations of the present study. Moreover not all of the placentas were examined pathologically in women with conservative surgery and detailed imaging studies could not be performed for some of the subjects especially including emergent cases for vaginal bleeding. But our results are mostly in compatible with the previous reported data. Identifying women at high risk of peripartum hysterectomy is important since it consents a better counseling and surgical management. It is highly advisable to perform surgery for placenta accreta/increta under elective, controlled conditions rather than as an emergency without adequate preparation. Before beginning the operation, multiple units of red blood cells, fresh frozen plasma and platelets should be made available.

In conclusion, the present study confirmed placenta previa is a condition for a substantial risk of peripartum emergent hysterectomy. Fortunately, the recent advance in imaging studies consents to predict myometrial invasion and consequently plays an important role in identifying women at high risk for peripartum hysterectomy.

Plasenta Previalı Hastalarda Peripartum Histerektomi İçin Risk Faktörleri

AMAÇ: Bu çalışmada plasenta previalı hastalarda peripartum histerektomi için antepartum risk faktörlerinin belirlenmesi amaçlanmıştır.

GEREÇ VE YÖNTEM: Adnan Menderes Üniversitesi Tıp Fakültesi Hastanesi'nde Ocak 2006-Ocak 2013 döneminde plasenta previa nedeniyle sezaryen yapılan 57 vaka retrospektif olarak değerlendirilmiştir. Histerektomi olan ve olmayan hastalar antepartum özellikleri açısından karşılaştırılmıştır.

BULGULAR: Plasenta previa nedeniyle sezaryen yapılan 57 hastadan 6'sına (%10,5) peripartum histerektomi uygulanmıştır. Tekrarlayan sezaryen hikayesi (p=0,045), plasental adezyon anomalileri (p<0,001) ve 2000 ml'den fazla kan kaybı (p<0,001) histerektomi için risk faktörleri olarak tespit edilmiştir.

SONUÇ: Bu çalışmada plasenta previanın acil peripartum histerektomi için önemli bir risk faktörü olduğu bir kez daha gösterilmiştir. Artan sayıda geçirilmiş sezaryenler, plasenta adezyon anomalileri ve 2000 ml'den fazla kan kaybı peripartum histerektomi için risk faktörleri olarak bulunmuştur. Plasenta previalı hastalarda adezyon anomalilerini belirlemek için antepartum görüntüleme yöntemlerinden yararlanılmalıdır.

Anahtar Kelimeler: Plasenta previa, Peripartum, Histerektomi

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