Factors Associated with Placenta Previa: A Retrospective, Single-Center Study in Turkey

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Background: The incidence of placenta previa is gradually increasing. The major risk factor is a history of cesarean section (CS). Such patients may experience severe bleeding during pregnancy and surgery. Patients with placenta previa were classified based on risk factors in this study. This retrospective study from a single center in Turkey aimed to evaluate the factors associated with placenta previa in 151 women.

Material/Methods: Patients with placenta previa were grouped by the presence/absence of prior CS. Group 1 (123 patients) had undergone at least 1 CS, and Group 2 (28 patients) had not undergone CS. The diagnosis of placenta previa was made by ultrasound. Placenta previa was defined as cases where the placenta crossed the internal os. Duration of surgery, bleeding during surgery, and the amounts of erythrocyte suspensions required were compared between groups.

Results: Of Group 1 patients, 67.5% had anterior placenta previa compared to 46.4% in Group 2. The mean duration of surgery was: 52.0±19.2 and 28.5±4.6 min (P<0.001); the number of sutures was 8.4±2.4 and 5.9±0.9 (P<0.001); the bleeding volumes were 720.3±536.2 and 344±137.0 mL (P<0.001); and the amount of erythrocyte suspension administered intraoperatively was 0.2±0.7 and 0.0±0.0 unit (P=0.032).

Conclusions: Mean duration of surgery, number of sutures, bleeding volume, and intraoperatively applied ES volumes were significantly different between groups. Identification of placenta previa patients who have undergone prior CS is vitally important in terms of preoperative preparation.

Keywords: Cesarean Section, Repeat • Maternal Mortality • Placenta Previa

Full-text PDF: https://www.medscimonit.com/abstract/index/idArt/938023
Factors associated with placenta previa

Findik F.M.: Factors associated with placenta previa © Med Sci Monit, 2022; 28: e938023

Indexed in: [Current Contents/Clinical Medicine] [Journals Citation Reports/Science Edition] [SCIE Expanded] [ISI Alerting System] [EMBASE/Excerpta Medica] [Chemical Abstracts/CAS]

CLINICAL RESEARCH

Background

Placenta previa is diagnosed when the placenta completely covers the internal cervical os. The prevalence rises as cesarean delivery numbers increase, to attain about 0.5% [1-3]. Previous placenta previa and prior cesarean section (CS) are the 2 most significant risk factors [4-7]. However, maternal age, multiparity, smoking, chronic hypertension, multiple gestations, and previous uterine procedures (curettage and myomectomy) are also risk factors [3-9]. Severe bleeding during labor is possible, especially during the third trimester. The other risks include a need for cesarean hysterectomy, preterm delivery, and maternal death [7,10,11]. Patients with a previous cesarean section are more likely to have placental invasion. These patients have a higher risk of antepartum hemorrhage, postpartum hemorrhage, and hysterectomy [6,10]. Transvaginal or transabdominal ultrasonography aid diagnosis [12]. Diagnostic ultrasonography reveals complete closure of the cervical os by the placenta. The present study shows that placenta previa etiologies differ greatly between women who have undergone prior CS and those who have not. This retrospective study from a single center in Turkey aimed to evaluate the factors associated with placenta previa in 151 women.

Material and Methods

We retrospectively studied placenta previa patients operated on by the same physician, from July 2017 to June 2020. The study was approved by the Ethics Committee of Clinical Research of the University of Dicle (Ethics Committee decision number: 2020-355). We defined 2 groups. Group 1 (123 patients) had undergone at least 1 CS, and Group 2 (28 patients) had not undergone CS. The patients in Group 1 consisted of patients with at least 1 previous cesarean section. In Group 2 was composed of patients who had never had a cesarean section and who had a normal delivery. This group also included first pregnancies. Patient data were extracted from electronic medical records. We recorded age, gravidity, parity, gestational week at birth, placental location, duration of surgery, number of sutures placed, estimated blood loss during surgery, invasion status, erythrocyte suspension (ES) volumes transfused during and after surgery, hemoglobin and hematocrit levels before and after surgery, and body mass index. The hemoglobin and hematocrit levels were measured immediately before and 3 h after surgery. In patients who received ES, values were measured 3 h after the end of the procedure.

Four units of ES were reserved for all patients preoperatively. Spinal was preferred to general anesthesia. Placental invasion was defined when the placenta could not be entirely removed but was extracted by hand (or using a ring forceps) from uterine myometrial tissue, associated with bleeding from the placental bed. FIGO staging criteria were taken into account in the diagnosis of placental invasion [13]. The volume of blood in the aspirator (a suction canister) was the estimated blood loss. Depending on the hemograms, ESs were administered to patients at risk of severe bleeding during surgery. One expert surgeon (Fatih Mehmet Findik) performed all CSs.

Inclusion and Exclusion Criteria

Patients whose placenta completely covered the cervical os (as revealed by preoperative ultrasonography) were included; those with low-lying placenta and who underwent surgery prior to week 20 were excluded. In addition, patients with multiple pregnancies and comorbidities such as diabetes mellitus, hypertension, and bleeding disorders were excluded from the study.

Statistical Analysis

Statistical analysis employed SPSS ver. 21.0 for Mac (SPSS, Inc., Chicago, IL, USA). Data are presented as means ± standard deviations or as medians with interquartile ranges. The Mann-Whitney U-test or the Fisher exact test was used to compare the groups. A P value <0.05 indicated statistical significance. The Kolmogorov–Smirnov test was used to evaluate whether data were normally distributed. Prior to the study, approval was obtained from our local ethics committee.

Results

A total of 151 placenta previa patients underwent operations; 123 patients in Group 1 (with at least 1 prior CS) and 28 in Group 2 (no CS). The mean ages of patients in Groups 1 and 2 were 33.5 ± 5.2 and 32.4 ± 7.1 years, respectively, and were not significantly different. Gravidity was 5.0 ± 2.3 in Group 1 and 3.8 ± 2.5 in Group 2, and thus was significantly different (P = 0.004). The placenta was anterior previa in 67.5% of Group 1 and 46.4% of Group 2; the difference was significant (P = 0.037). Table 1 presents further demographic information. The mean duration of surgery was 52.0 ± 19.2 and 28.5 ± 4.6 min (P < 0.001); the numbers of sutures placed was 8.4 ± 2.4 and 5.9 ± 0.9 (P < 0.001); the bleeding volumes were 720.3 ± 536.2 ml and 344 ± 137.0 ml (P < 0.001); and the intraoperatively administered ES volumes were 0.2 ± 0.7 and 0.0 ± 0.0 L (P = 0.032), respectively, and the differences were significant. The surgical data are presented in Table 2.

Discussion

In our study, the difference between the groups in terms of operation time, numbers of sutures, amount of bleeding, and
|                                      | Placenta previa with previous cesarean | Placenta previa without previous cesarean | P  |
|--------------------------------------|---------------------------------------|------------------------------------------|----|
| Age                                  | 33.5±5.2                              | 32.4±7.1                                 | 0.526 |
| Gravida                              | 5.0±2.3                               | 3.8±2.5                                  | 0.004 |
| Parity                               | 3.5±1.9                               | 2.2±1.9                                  | 0.002 |
| Hospital stay (days)                 | 2.5±2.3                               | 2.3±2.1                                  | 0.028 |
| Totalis part                         |                                       |                                          |    |
| Anterior                             | 67.5                                  | 46.4                                     | 0.037 |
| Posterior                            | 32.5                                  | 53.6                                     |    |
| BMI                                  | 29.6±4.6                              | 29.3±2.7                                 | 0.731 |
| Apgar 1                              | 5.4±1.5                               | 5.4±1.9                                  | 0.796 |
| Apgar 5                              | 8.0±1.3                               | 7.8±1.6                                  | 0.756 |

Table 1. Demographic data of patients.

|                                      | Placenta previa with previous cesarean | Placenta previa without previous cesarean | P  |
|--------------------------------------|---------------------------------------|------------------------------------------|----|
| Invasion                             |                                       |                                          |    |
| Yes                                  | 92.7                                  | 35.7                                     | <0.001 |
| No                                   | 7.3                                   | 64.3                                     |    |
| Preoperative hb (g/dl)               | 11.6±1.6                              | 11.8±1.2                                 | 0.675 |
| Postoperative hb (g/dl)              | 10.0±1.4                              | 10.5±1.3                                 | 0.096 |
| Preoperative hct (g/dl)              | 34.7±4.1                              | 35.2±3.9                                 | 0.527 |
| Postoperative hct (g/dl)             | 29.8±3.8                              | 31.2±3.8                                 | 0.107 |
| Number of sutures used               | 8.4±2.4                               | 5.9±0.9                                  | <0.001 |
| Operating time (min)                 | 52.0±19.2                             | 28.5±6.6                                 | <0.001 |
| Intraoperative blood loss (ml)       | 720.3±536.2                           | 344±137.0                                | <0.001 |
| Intraoperative ES                    | 0.2±0.7                               | 0.0±0.0                                  | 0.032 |
| Postoperative ES                     | 0.4±0.7                               | 0.3±0.9                                  | 0.479 |
| Total ES kan                         | 0.6±1.2                               | 0.3±0.9                                  | 0.157 |
| Intraoperative blood requirement     |                                       |                                          |    |
| Yes                                  | 14.6                                  | 0.0                                      | 0.026 |
| No                                   | 85.4                                  | 100.0                                    |    |
| Total blood requirement              |                                       |                                          |    |
| Yes                                  | 27.6                                  | 14.3                                     | 0.142 |
| No                                   | 72.4                                  | 85.7                                     |    |

Table 2. Operative data.
Placenta previa rates have risen dramatically in recent years. In our region, the incidence is 8.1% [14-16]. A previous CS is a major cause of this increase [17]. A placenta previa is more than a diagnosis. A placenta previa can cause hemorrhage during pregnancy and delivery, and maternal mortality. The infant may need to be delivered early, especially in patients with invasive abnormalities. The risk of hysterectomy in such patients is also rather high [2,7,10]. Although placenta previa is diagnosed by ultrasound, placental invasion is not always detectable in patients receiving standard obstetric care [18]. The literature reveals that placental invasion is likely to be associated with prior CS, but no distinction was made based on the patient’s previous method of delivery [19]. Another study reported that the risk of invasion is increased, especially in women who have had a previous cesarean section [6]. In our study, we found a very significant difference in placental invasion between the 2 groups (92.7 and 35.7%, P<0.001). Inquiring about a prior CS aids estimation of placental invasion.

In another study on antepartum bleeding, the amount of bleeding was higher in the group with high invasion [10]. In this study, no distinction was made according to the needs of the patient. In addition, more specific information about the disease can be given to the patient. According to the preoperative preparation process will be carried out according to the needs of the patient. In addition, more specific information about the disease can be given to the patient. A placenta previa can cause hemorrhage during pregnancy and delivery, and maternal mortality. The infant may need to be delivered early, especially in patients with invasive abnormalities. The risk of hysterectomy in such patients is also rather high [2,7,10]. Although placenta previa is diagnosed by ultrasound, placental invasion is not always detectable in patients receiving standard obstetric care [18]. The literature reveals that placental invasion is likely to be associated with prior CS, but no distinction was made based on the patient’s previous method of delivery [19]. Another study reported that the risk of invasion is increased, especially in women who have had a previous cesarean section [6]. In our study, we found a very significant difference in placental invasion between the 2 groups (92.7 and 35.7%, P<0.001). Inquiring about a prior CS aids estimation of placental invasion.

In conclusion, placenta previa patients (who are becoming more common) require careful obstetric care. These patients have a high risk of bleeding and may need hysterectomy during surgery. The need for blood transfusions is also high. We observed that there were significant differences between the groups in terms of duration of surgery, amount of bleeding, amount of ES used, and length of hospital stay. It is essential to ask patients if they have undergone prior CS. In this way, the preoperative preparation process will be carried out according to the needs of the patient. In addition, more specific information about the disease can be given to the patient.
References:

1. Ozdemirci S, Akpinar F, Baser E, et al. Effect of the delivery way and number of parity in the subsequent incidence of placenta previa. J Matern Fetal Neonatal Med. 2020;33(19):3238-43

2. Cresswell JA, Ronsmans C, Calvert C, et al. Prevalence of placenta praevia by world region: A systematic review and meta-analysis. Trop Med Int Health. 2013;18(6):712-24

3. Kollmann M, Gauhlofer J, Lang U, et al. Placenta praevia: Incidence, risk factors and outcome. J Matern Fetal Neonatal Med. 2016;29(9):1395-98

4. Lavery JP. Placenta previa. Clin Obstet Gynecol. 1990;33(3):414-21

5. Klar M, Michels KB. Cesarean section and placental disorders in subsequent pregnancies – a meta-analysis. J Perinat Med. 2014;42(5):571-83

6. Jain V, Bos H, Bujoel D. Guideline No. 402: Diagnosis and management of placenta previa. J Obstet Gynaecol Can. 2020;42(7):906-17

7. Jauniaux E, Alfrevic Z, Bhide AG, et al. Royal College of Obstetricians and Gynaecologists. Placenta praevia and placenta accreta: Diagnosis and management: Green-top Guideline No. 27A. BJOG. 2019;126(1):e1-e48

8. Jenabi E, Salimi Z, Bashirian S, et al. The risk factors associated with placenta previa: An umbrella review. Placenta. 2022;17:21-27

9. Ananth CV, Savitz DA, Luther ER. Maternal cigarette smoking as a risk factor for placental abruption, placenta previa, and uterine bleeding in pregnancy. Am J Epidemiol. 1996;144(9):881-89

10. Long SY, Yang Q, Chi R, et al. Maternal and neonatal outcomes resulting from antepartum hemorrhage in women with placenta previa and its associated risk factors: A single-center retrospective study. Ther Clin Risk Manag. 2021;17:31-38

11. Solheim KN, Esakoff TF, Little SE, et al. The effect of cesarean delivery rates on the future incidence of placenta previa, placenta accreta, and maternal mortality. J Matern Fetal Neonatal Med. 2011;24(11):1341-46

12. Farine D, Fox HE, Jakobson S, et al. Vaginal ultrasound for diagnosis of placenta previa. Am J Obstet Gynecol. 1988;159(3):566-69

13. Jauniaux E, Ayres-de-Campos D, Langhoff-Roos J, et al. FIGO Placenta Accreta Diagnosis and Management Expert Consensus Panel. FIGO classification for the clinical diagnosis of placenta accreta spectrum disorders. Int J Gynaecol Obstet. 2019;148(1):20-24

14. Findik FM, Icen MS, Tunç SY, et al. Evaluation of patients with previous C/S+placenta previa. Totals İn 2017. Dicle Tip Dergisi. 2020;47(3):630-37

15. Bowman ZS, Eller AG, Barsdley TR, et al. Risk factors for placenta accreta: A large prospective cohort. Am J Perinatol. 2014;31(9):799-804

16. Sallam HF, Shady NW. A sandwich technique (N&H variation technique) to reduce blood loss during cesarean delivery for complete placenta previa: A randomized controlled trial. J Matern Fetal Neonatal Med. 2019;32(19):3145-52

17. Wang YL, Su FM, Zhang HY, et al. Aortic balloon occlusion for controlling intraoperative hemorrhage in patients with placenta previa increta/percreta. J Matern Fetal Neonatal Med. 2017;30(21):2564-68

18. Baillit JL, Grobman WA, Rice MM, et al. Morbidly adherent placenta treatments and outcomes. Obstet Gynecol. 2015;125(3):683-89

19. Hobson SR, Kingdon JC, Murjil A, et al. No. 383-screening, diagnosis, and management of placenta accreta spectrum disorders. J Obstet Gynaecol Can. 2019;41(7):1035-49

20. Ma Y, Liu R, Zhang J, et al. An analysis of maternal-fetal prognosis in patients with placenta accreta. J Matern Fetal Neonatal Med. 2021;34(5):725-31

21. Tikkanen M, Paavonen J, Loukovaara M, et al. Antenatal diagnosis of placenta accreta leads to reduced blood loss. Acta Obstet Gynecol Scand. 2011;90(10):1140-46

22. Fitzpatrick KE, Sellers S, Spark P, et al. The management and outcomes of placenta accreta, increta, and percreta in the UK: A population-based descriptive study. BJOG. 2014;121(1):62-71

23. Chen M, Liu X, You Y, et al. Internal iliac artery balloon occlusion for placenta accreta: A randomized controlled trial. Obstet Gynecol. 2020;135(5):1112-19

24. Mhyre JM, Shlikruth A, Kuklina EV, et al. Massive blood transfusion during hospitalization for delivery in New York State, 1998-2007. Obstet Gynecol. 2015;126(6):1288-94

25. Jacovelli A, Liberati M, Khalil A, et al. Risk factors for abnormally invasive placenta: A systematic review and meta-analysis. J Matern Fetal Neonatal Med. 2020;33(3):471-81

26. Park HS, Cho HS. Management of massive hemorrhage in pregnant women with placenta previa. Anesth Pain Med. 2020;15(4):409-16

27. Baba Y, Matsubara S, Ohkuchi A, et al. Anterior placenta: A risk factor for massive hemorrhage during cesarean section in patients with placenta previa. J Obstet Gynaecol Res. 2014;40(5):1243-48

28. Jang DG, Lee JS, Shin JJ, et al. Maternal outcomes according to placental position in placenta previa. Int J Med Sci. 2011;8(5):439-44