ลักษณะทางคลินิกของผู้คลอดที่ต้องผ่าตัดมดลูกฉุกเฉิน จากภาวะตกเลือดหลังคลอด ในโรงพยาบาลมหาราชนครราชสีมา

Emergency postpartum hysterectomy in Maharat Nakhon Ratchasima Hospital: clinical characteristic and risk factors

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ABSTRACT

Background : Postpartum hemorrhage remains a leading cause of maternal death. Although there has been improved of various treatment, such as prostaglandin, uterine tamponade and β-Lynch suture. However some women do not respond to these treatments and need Emergency postpartum hysterectomy (EPH) for control intractable bleeding. Many studies had addressed this serious life-threatening condition with inconclusive risk factors. The aim of this study is to determine clinical characteristic that associated with EPH in Maharat Nakhon Ratchasima Hospital.

Objective : To determine the incidence, indications and factors influencing EPH.

Design : A retrospective hospital-based descriptive and case control study.

Setting : Department of Obstetrics and Gynecology, Maharat Nakhon Ratchasima Hospital.

Methods and materials :

Cases of EPH carried out within 24 hours after delivery at Maharat Nakhon Ratchasima Hospital during January 2001 and December 2009 were identified from labor registration records. We reviewed their medical records to assess for the following outcome (1) incidence of EPH (2) indication for EPH (3) Factors that association with EPH (4) complication after EPH. Women who gave birth before (2 cases) and after (2 cases) the case of EPH were the control using to assess the risk factors association with EPH.

Result : Among 74,925 deliveries after 28 weeks gestational age during January 2001 and December 2009, 124 cases underwent EPH giving an incidence 1.65:1000 deliveries. Medical records were available for 117 cases. Placenta adherent (58.12%) was the most common indication

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of EPH followed by uterine atony (32.48%) and uterine rupture (9.4%). The significant risks factors affecting EPH by multivariate logistic regres sion analysis were maternal age > 35 years, multiparity, placenta abruption, placenta previa, preeclampsia, vacuum extraction and cesarean delivery. When devied patients by indication for EPH the "adherent" group had a previous cesarean delivery 69.1%, placenta previa 66.2% higher than "atony" and "rupture" groups. In the "atony" and "rupture" groups had preclampsia 29% and 36.4%, abruption placenta 15.8% and 18.2% higher than the "adherent" groups. The complications were mostly found in "adherent" group. 1 had bladder injury and another 2 had bowel injury. In the "adherent" group EPH were mostly performed at the time of cesarean section 83.8%. The "atony" group EPH were mostly performed after vaginal delivery 39.5% and 34.2% had coagulopathy. There were three maternal death. All of them were "atony" group with coagulopathy. Duration for EPH after vaginal delivery were 230, 250 and 360 minutes respectively.

Conclusions : Incidence of EPH is not uncommon in the modern obstetric practice of increasing elderly pregnancy and cesarean section rate.

Keywords : Postpartum hemorrhage, postpartum hysterectomy, risk factors

บทคัดย่อ

หลักการและเหตุผล : ภาวะตกเลือดหลังคลอดเป็นสาเหตุหลักที่ทำให้มารดาเสียชีวิต แม้ว่าจะมีการพัฒนา การดูแลคุณภาพการดูแลหญิงตั้งครรภ์ในกลุ่มเสี่ยง พัฒนาคุณภาพยาที่ช่วยในการหดรัดตัวของมดลูก ตลอดจนเทคนิคการผ่าตัด แต่ยังคงมีผู้คลอดบางกลุ่มที่ไม่ตอบสนองต่อการรักษา แพทย์จำเป็นต้องให้การรักษาด้วยการผ่าตัดมดลูกฉุกเฉิน ซึ่งปัจจัยเสี่ยงที่นำไปสู่การตัดมดลูกฉุกเฉินในแต่ละรายยังไม่มีข้อสรุป ผู้วิจัยจึงสนใจที่จะศึกษาลักษณะทางคลินิคของผู้คลอดที่สัมพันธ์กับการตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอดในโรงพยาบาลมหาราชนครราชสีมา

วัตถุประสงค์ : เพื่อหาอุบัติการณ์ ข้อบ่งชี้ ลักษณะทางคลินิกของผู้คลอดที่มีความสัมพันธ์กับการตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอด

รูปแบบการวิจัย : เป็นการศึกษาแบบ retrospective hospital based descriptive และ case control

สถานศึกษา : กลุ่มงานสูติ-นรีเวชกรรม โรงพยาบาลมหาราชนครราชสีมา

วิธีการศึกษา : รวบรวมข้อมูลของผู้คลอดจากเวชระเบียนของโรงพยาบาล

กลุ่มศึกษา : หญิงตั้งครรภ์ที่มีอายุครรภ์ 28 สัปดาห์ขึ้นไปทุกรายที่คลอดที่โรงพยาบาลมหาราชนครราชสีมา และได้รับการผ่าตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอดภายใน 24 ชั่วโมงหลังคลอด ในช่วง มกราคม พ.ศ. 2544 – ธันวาคม พ.ศ. 2552 กลุ่ม control ได้แก่หญิงตั้งครรภ์ที่คลอดก่อนและหลังผู้คลอดรายที่ศึกษาโดยใช้ก่อนหน้า 2 ราย และหลัง 2 ราย ข้อมูลที่ได้จะถูกนำมาวิเคราะห์ทางสถิติ เพื่อหาอุบัติการณ์ ข้อบ่งชี้ ลักษณะทางคลินิกของผู้คลอดที่มีความสัมพันธ์กับการตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอดและภาวะแทรกซ้อนที่พบ

ผลการศึกษา : ในช่วงระยะเวลาที่ศึกษามีผู้คลอดที่อายุครรภ์ตั้งแต่ 28 สัปดาห์ขึ้นไป คลอดที่โรงพยาบาลมหาราชนครราชสีมาทั้งสิ้น 74,925 ราย ในจำนวนนี้มี 124 ราย ที่ได้รับการผ่าตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอด คิดเป็นอุบัติการณ์ 1.65 ต่อ 1000 การคลอด เวชระเบียนครบ 117 ราย พบข้อบ่งชี้ คือ ภาวะรกเกาะติดแน่น (ร้อยละ 58.12) มดลูกไม่หดรัดตัว (ร้อยละ 32.48) มดลูกแตก (ร้อยละ 9.4) จากการวิเคราะห์พหุปัจจัยพบลักษณะทางคลินิกของผู้คลอดที่เป็นความเสี่ยงอย่างมีนัยสำคัญได้แก่ อายุมากกว่าหรือเท่ากับ 35 ปี เคยคลอดบุตรคลอดด้วยเครื่องดูดสุญญากาศ คลอดโดยการผ่าตัดคลอด มีภาวะรกลอกตัวก่อนกำหนด มีภาวะรกเกาะต่ำและมีความดันโลหิตสูงจากการตั้งครรภ์ เมื่อพิจารณาผู้คลอดที่ต้องตัดมดลูกฉุกเฉินจำแนกตามข้อบ่งชี้พบว่าในกลุ่มรกเกาะติดแน่นเคยผ่าตัดคลอดร้อยละ 69.1 และมีภาวะรกเกาะต่ำร้อยละ 66.2 มากกว่าอีกสองกลุ่มอย่างชัดเจน กลุ่มมดลูกไม่หดรัดตัวและกลุ่มมดลูกแตก มีภาวะความดันโลหิตสูงจากการตั้งครรภ์ (ร้อยละ 29 และร้อยละ 36.4) และรกลอกตัวก่อนกำหนด (ร้อยละ 15.8 และร้อยละ 18.2) สูงกว่ากลุ่มรกเกาะติดแน่น

อย่างชัดเจน การบาดเจ็บต่ออวัยวะใกล้เคียงพบมากที่สุดในกลุ่มรกเกาะติดแน่น พบการฉีกขาดของกระเพาะปัสสาวะ 1 ราย การฉีกขาดของลำไส้ 2 ราย ผ่าตัดมดลูกในขณะผ่าตัดคลอดมากที่สุดในกลุ่มรกเกาะติดแน่น (ร้อยละ 83.8) กลุ่มมดลูกไม่หดรัดตัวผ่าตัดมดลูกหลังจากคลอดทางช่องคลอดมากที่สุด (ร้อยละ 39.5) และมีภาวะการแข็งตัวของเลือดผิดปกติมากที่สุด (ร้อยละ 34.2) มีผู้คลอดเสียชีวิต 3 ราย อยู่ในกลุ่มมดลูกไม่หดรัดตัวและมีภาวะการแข็งตัวของเลือดผิดปกติทั้ง 3 ราย ได้รับการผ่าตัดมดลูกหลังคลอดทางช่องคลอดนาน 230 นาที 250 นาที และ 360 นาทีตามลำดับ

สรุป : การตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอด มีแนวโน้มจะพบได้บ่อยขึ้นสำหรับสูติแพทย์ในยุคปัจจุบัน เหตุเพราะมีการตั้งครรภ์ในสตรีที่มีอายุมากขึ้น ประกอบกับอัตราการผ่าตัดคลอดที่สูงขึ้น

คำสำคัญ : ตกเลือดหลังคลอด ผ่าตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอด ปัจจัยเสี่ยง

Introduction

Postpartum hemorrhage is the world leading cause of maternal death with 140,000 cases per year or 1 case in every 4 minutes.[1,2,3] In developed country, maternal morbidity and mortality from postpartum hemorrhage have declined significantly due to proper antenatal care in high risk group, new pharmacologic agents and new surgical techniques[4,5,6]. Despite these, Emergency postpartum hysterectomy(EPH) had been performed frequently as a lifesaving measure to manage uncontrolled uterine hemorrhage with the incidence of 0.24-1.4 per 1000 deliveries[7]. Many studies had addressed this serious life-threatening condition with inconclusive risk factors.

In 1993, Stanco LM. and colleagues[8] raised that cesarean delivery, history of cesarean section and placenta previa to be the risk factors for EPH. He concluded that history of cesarean section was associated with placenta previa.

In 1997, Thinkhanmarop J and colleagues[9] proposed that maternal age, multiparity, placenta previa, oxytocin induction and operative vaginal delivery were risk factors through univariate logistic regression analysis. On multivariate logistic regression analysis, age and oxytocin usage were proved to be risk factors.

In 2003, Kaemar J and colleagues[10] suggested that cesarean section contributed to EPH, but oxytocin usage was not.

In 2006, Watanosomsiri N and colleagues11 worked on the cesarean section group and reported that advanced maternal age, multiparity, history of cesarean section were risk factors through univariate logistic regression analysis. By doing multivariate logistic regression analysis, risk factors appeared to be placenta previa and multiparity.

In 2006, Kwee A. and colleagues[12] had done prospective study and found the risk factors to be cesarean delivery and history of cesarean section.

In 2006, Eniola OA. and colleagues[13] proposed that cesarean delivery, history of cesarean section and placenta previa were risk factors.

In 2009, Yamasmit W. and colleagues[14] found that the risk factor was placenta previa. There was no association with age and multiparity.

In 2010, Lone F. and colleagues[15] reported that increasing age, multiparity, history of cesarean section, placenta previa and failed induction of labor were the risk factors on univariate logistic regression analysis. After multivariate logistic regression analysis, multiparity, placenta previa and failed induction of labor were found to be risk factors.

In 2010, Roethisberger M. and colleagues[16] concluded that placenta previa was the risk factor, while maternal age and cesarean delivery were not.

In 2010, Rossi AC and colleagues[17] made a review and found that multiparity, history of cesarean section, cesarean delivery and placenta previa were risk factors for EPH.

Over the past decades, there were changes in clinical characteristics of pregnant women and treatments. The increase in cesarean delivery rate, advanced maternal age pregnancy and new pharmacological or mechanical methods treatment had changed clinical course of the disease. This may explain the different conclusions in previous studies.

The author is interested in determining the clinical characteristics of patients that are associated with EPH. These results may help to decline maternal morbidity and mortality through proper preventive and therapeutic measures for EPH.

Objective :

To determine the incidence, indications and factors influencing EPH.

Design :

A retrospective hospital-based descriptive and case control study.

Materials :

Data were collected from labor ward registry, hospital registry and pathologic reports databases.

Study group :

Pregnant women who had undergone EPH at Maharat Nakhon Ratchasima Hospital between January 2001 and December 2009 were recruited. All candidates must have gestational age above 28 weeks with postpartum hemorrhage within 24 hours after delivery. Additionally, data of those who had delivered normally before (2 patients) and after (2 patients) the study group were also recruited as the control group.

Definition

Postpartum hemorrhage: Defined as the loss of 500 ml of blood or more after completion of the third stage of labor in vaginal delivery or 1000 ml of blood or more in cesarean delivery.

Emergency postpartum hysterectomy: Defined as the unplanned action of hysterectomy within 24 hours postpartum.

Oxytocin usage: Defined as the use of oxytocin for induction or augmentation during first and second stage of labor.

Coagulopathy: Defined as the prothrombin time (PT) more than 1.5 times of normal level.

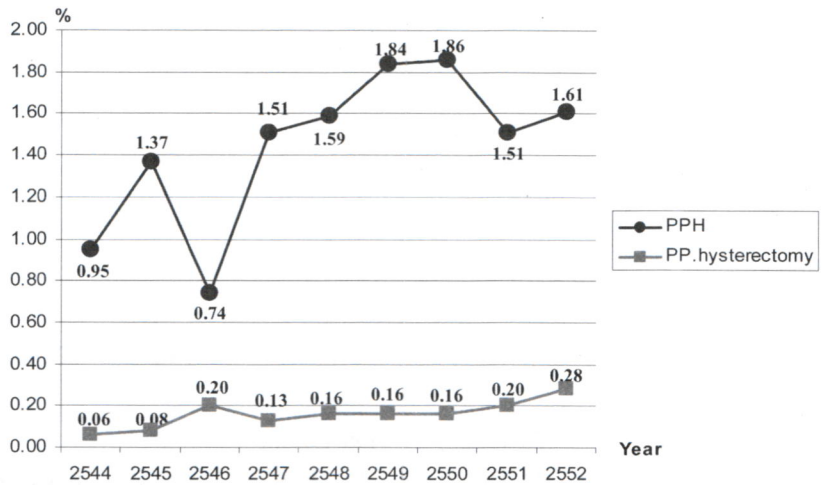
Statistical Analysis

Data was analyzed by using chi-square method and fisher-exact test. Logistic regression was used to find out the

effect of all the possible interacting variables on outcome. P <0.05 was considered statistically significant and nonsignificant variables were excluded from the analysis. These were done through available statistic software.

Results

There were 74,925 pregnant women with gestational age above 28 weeks who had delivered in Maharat Nakhon Ratchasima Hospital between January 2001and December 2009. 1,082 patients(1.44%) had postpartum hemorrhage. Of these, 124 had undergone EPH with the incidence of 1.65 per 1000 deliveries. 7 patients were excluded due to incomplete data record. The remaining 117 records were analyzed. The incidence of postpartum hemorrhage and EPH per year are demonstrated in Figure 1.



(Fig. 1) The incidences of postpartum hemorrhage and emergency postpartum hysterectomy.

The indications for EPH were placenta adherent (58.12%), uterine atony (32.48%) and uterine rupture (9.40%). Table 1

Table 1 The indications for EPH

Indication	Patient (%)
Placenta adherent	68 (58.12)
Uterine atony*	38 (32.48)
Uterine rupture	11 (9.40)
Total	117 (100)

* Intractable postpartum hemorrhage after pharmacologic and conservative surgical treatment

The results of univariate logistic regression analysis are shown in Table 2. The odds ratios are significant for age ≥ 35 years , multiparity, history of cesarean section, placenta abruption, placenta previa, preeclampsia and cesarean delivery (P<0.001).

Table 2 Risk factors for EPH (univariate logistic regression analysis)

	Study group n (%)	Control group n (%)	Odd ratio	95% CI	p-value (< 0.05)
Age (year)					
< 35	50 (42.74)	412 (88.03)	1		
> 35	67 (57.26)	56 (11.97)	9.86	6.2-15.6	< 0.001*
Parity					
0	14 (11.97)	239 (51.07)	1		
> 1	103 (88.0)	229 (48.90)	7.68	4.2-14.9	< 0.001*
Previous cesarean delivery					
No	62 (52.99)	398 (85.04)	1		
Yes	55 (47.01)	70 (14.96)	5.04	3.23-7.85	< 0.001*
Placenta abruption					
No	109 (93.16)	467 (99.79)	1		
Yes	8 (6.84)	1 (0.21)	34.27	4.24-276.90	< 0.001*
Placenta previa					
No	70 (59.83)	458 (97.86)	1		
Yes	47 (40.17)	10 (2.14)	30.75	14.85-63.64	< 0.001*
Preeclampsia					
No	92 (78.63)	444 (94.87)	1		
Yes	24 (5.13)	25 (21.377)	5.02	2.7-9.19	< 0.001*
Oxytocin					
No	35 (29.91)	151 (32.26)	1		
Yes	82 (70.09)	317 (67.74)	1.12	0.72-1.7	0.595
Route of delivery					
Normal labor	17 (14.53)	228 (48.72)	1		
Vacuum extraction	10 (8.55)	63 (13.46)	2.12	0.92-4.8	0.074
Cesarean delivery	90 (76.92)	177 (37.82)	6.81	3.91-11.87	< 0.001*
Gestational age(week)					
> 42	1 (0.85)	10 (2.14)	1		
37-41	81 (69.23)	394 (84.19)	2.05	0.25-16.28	0.495
28-36	35 (29.91)	64 (13.68)	5.46	0.67-44.50	0.112

However, on multivariate logistic regression analysis, age ≥ 35 years (P=0.001), multiparity (P=0.001), vacuum extraction (P=0.02), cesarean delivery (P=0.008), placenta abruption (P=0.002), placenta previa and preeclampsia (P=0.013) remain to be risk factors. (Table 3)

Table 3 Risk factors for EPH (multivariate logistic regression analysis)

	Adjusted Odd ratio	95% CI	p-value (< 0.05)
Age ≥ 35 years	5.77	3.23-10.29	0.001*
Parity ≥ 1	3.88	1.85-8.12	0.001*
Vacuum extraction	3.14	1.18-8.33	0.02*
Cesarean delivery	2.54	1.28-5.05	0.008*
Placenta abruption	43.74	3.93-486.32	0.002*
Placenta previa	15.49	6.70-35.79	0.001*
Preeclampsia	2.85	1.25-6.50	0.013*

Table 4 demonstrates the complications in placenta adherent, uterine atony and uterine rupture groups which are the indications for EPH. From this study, the former group has significantly higher number of previous cesarean delivery (69.1%) and placenta previa (66.2%) than latter groups. On the other hand, the latter groups have significantly higher number of preeclampsia (29%, 36.4%) and placenta abruption (15.8%, 18.2%) than the former group. Intraoperative complications occurred mostly in the placenta adherent group. In this group, there were 1 bladder injury and 2 bowel injuries.

Table 4 Obstetric complication associate with EPH devided by indication.*

Obstetrics complication	Placenta adherent† n = 68	Uterine atony n = 38	Uterine rupture n = 11
Previous cesarean delivery	47 (69.1)	5 (13.2)	3 (27.3)
Preeclampsia	10 (14.7)	11 (29)	4 (36.4)
Placenta previa	45 (66.2)	2 (5.3)	0
Placenta abruption	0	6 (15.8)	2 (18.2)
Additional procedure			
Unilateral Salpingooophorectomy	18 (26.5)	4 (10.5)	3 (27.3)
Bilateral Salpingooophorectomy	2 (3)	0	1 (9.1)
Repair of bladder	1 (1.5)	1 (2.7)	0
Repair of bowel	2 (2.9)	0	0

Obstetrics complication	Placenta adherent† n = 68	Uterine atony n = 38	Uterine rupture n = 11
Coaggulopathy	4 (5.9)	13 (34.2)	0
Death	0	3	0
Timing of EPH			
Caesarean hysterectomy	57 (83.8)	16 (42.1)	7 (63.6)
Post caesarean section	3 (4.4)	7 (18.4)	0
Post vaginal delivery	8 (11.8)	15 (39.5)	4 (36.4)

* One patient may have more than one complication

† Confirm by pathological diagnosis

Placenta accrete : 36 patients, Placenta increta : 29 patients, Placenta percreta : 3 patients

Of the 117 women included in the study, 80 (68.37%) had EPH during cesarean delivery. Placenta adherent and uterine rupture were the main causes for cesarean hysterectomy. On the other hand, coagulopathy and performing EPH after vaginal delivery were found mostly in uterine atony group 34.2% and 39.5% respectively. 3 maternal deaths had occurred after vaginal delivery and all of these had uterine atony with coagulopathy. Time took to consider emergency hysterectomy after deliveries were 230, 250 and 360 minutes respectively (180.5 minutes in average in this study).

Discussion

The incidence of postpartum hemorrhage in Maharat Nakhon Ratchasima hospital is 1.44%. This is consistent with previous studies[6,9,20]. Similarly, the incidence of EPH is estimated to be 1.65 per 1000 deliveries, which is in concordance with USA report[17]. (0.8 -2.28 per 1000 deliveries) From Scandinavia report[18], the incidence is 0.2-1.5 per 1000 deliveries and this is supported by many Thai reports which have the incidence of 0.25-0.96 per 1000 deliveries[9,11,14,22]. This may be attributed to the role as the main tertiary hospital in the Northeastern part of Thailand, whereby all hospitals in the nearby provinces and suburban areas are referred.

The finding of the present study states that placenta adherent is the major cause for EPH, which is similar to many studies[7,8,12,16,17,23]. For decades, uterine atony had been the leading cause[8,24]. This change may be due to the introduction of new pharmacologic agents and conservative surgical techniques that helped to treat uterine atony effectively. However, alongside the rising cesarean delivery rate and increasing maternal age, there has been a marked increase in the incidence of placenta adherent11,14,17,19. This study has 55 (47.01%) cases of previous cesarean delivery and 67 (57.26%) cases of age ≥ 35 years.

On multivariate logistic regression analysis, clinical characteristics of the EPH group, on comparing to the control group, have odd ratios significantly higher in age ≥ 35 years (P=0.001), multiparity (P=0.001), placenta abruption (P=0.002), placenta previa (0.001), preeclampsia (P=0.013), vacuum extraction (P=0.02) and cesarean delivery (P=0.008). In the review by Rossi AC and colleagues[17], he also showed that multiparity, cesarean delivery and placenta previa were risk factors. The difference is the history of cesarean delivery which cannot find to be significant in this study after multivariate logistic regression analysis. This may be because few of the previous cesarean sections in our study have the above risk factors.

This study finds advanced maternal age to be the risk factor which is supported by Thinkhanmarop J. and colleagues[9]. On contrary, vacuum extraction, preeclampsia and placenta abruption are found to be risk factors which have not been reported by previous studies. Vacuum extraction, preeclampsia and placenta abruption can predispose uterine atony which can consequently lead to EPH.

On analyzing the indicated causes of EPH , this study finds that placenta adherent has association with history of cesarean section (69.1%) and placenta previa (66.2%), which is similar to previous studies[8,11,13,14]. We propose that 2D or Doppler ultrasonography can be done routinely during antenatal care for advanced elderly gravidarum, history of cesarean delivery and placenta previa patients to detect hinder placenta adherent[25,26]. So that, physicians can prepare medical team services, blood components and give counseling to the patients and family prior operation. Uterine atony and uterine rupture groups have significantly higher preeclampsia (29%, 36.4%) and placenta abruption (15.8%, 18.2%) than placenta adherent group. Most of the coagulopathy occurred in uterine atony group (34.2%) and this can be explained by the prolonged conservative treatments after vaginal delivery. Guideline for postparum hemorrhage should be implemented for physicians to treat intractable postpartum hemorrhage promptly. This will lead to a decline in maternal mortality.

Conclusion

From the study, the incidence of EPH is 1.65 per 1000 deliveries. The indications are placenta adherent (58.12%), uterine atony (32.48%) and uterine rupture (9.40%). On multivariate logistic regression analysis, clinical characteristics factors that associated with EPH are age ≥ 35 years, multiparity, vacuum extraction, cesarean delivery, placenta abruption, placenta previa and preeclampsia. Placenta adherent is associated with history of cesarean delivery (69.1%) and placenta previa (66.2%). It also has the highest risk of having intraoperative complications. On the other hand, uterine

atony and uterine rupture are associated with preeclampsia (29%, 36.4%) and placenta abruption (15.8%, 18.2%). Uterine atony has the highest risk of coagulopathy (34.2%) that may cause maternal death. Prompt decision on hysterectomy is suggested to prevent maternal mortality.

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