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Emergency Peripartum Hysterectomy from Postpartum Hemorrhage in Sisaket Hospital: Clinical characteristics and risk factors

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ABSTRACT

Background: Postpartum hemorrhage remains a leading cause of maternal death. Although there had been the improvement of various treatments, such as prostaglandin and ß-Lynch suture, some women did not respond to these treatments and needed Emergency peripartum hysterectomy (EPH) to control intractable bleeding. The aim of this study was to determine clinical characteristics associated with EPH in Sisaket Hospital.

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

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

Setting: Department of Obstetrics and Gynecology, Sisaket Hospital.

Methods and Materials: Women who was pregnant 28 weeks gestational age or more and carried out EPH within 24 hours after delivery at Sisaket Hospital from January 2012 to June 2015 (total 26 cases) were identified from labor registration records. Their medical records were reviewed to assess the following outcomes (1) incidence of EPH (2) indications for EPH (3) clinical characteristics and risk factors associated with EPH (4) complications after EPH. Women who gave birth before (2 cases) and after (2 cases) the cases of EPH (total 104 cases) were the control used to assess the risk factors associated with EPH.

Result: During the study period, there were 17,566 deliveries at 28 weeks gestational age or more. Among them, there were 26 cases undergoing EPH. The incidence was 1.48 per 1,000 deliveries. Medical records showed that placenta adherent (65.38%) was the most common indication of EPH followed by uterine atony (26.92%) and uterine rupture (7.69%). The significant risk factors affecting EPH by multivariate logistic regression analysis were maternal age ≥ 35 years, cesarean delivery and delivery at 28-36 weeks gestational age. There were two maternal deaths after EPH.

Conclusions: Clinical characteristics and risk factors associated with EPH were age ≥ 35 years, cesarean delivery and delivery at GA28-36weeks.

Keywords: Emergency peripartum hysterectomy, clinical characteristics, risk factors

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Introduction

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

Some of the studies concluded that cesarean section and placenta previa were risk factors for EPH[8-11]. Cesarean delivery was also found to be the risk factor for EPH according to one prospective study[12]. Other risk factors such as placenta previa, advanced maternal age, multiparity and failed oxytocin induction were concluded by univariate and multivariate logistic regression analysis[13-15].

However, the consensus of these studies was not quite the same. For example, some studies found that placenta previa was the risk factor for EPH by multivariate logistic regression analysis[14, 15], while in another study, the result was not the same according to similar statistical analysis[13]. The different conclusion in many studies was also found on other associated factors such as advanced maternal age, multiparity, oxytocin usage, cesarean section and history of cesarean delivery[9-11, 13-17]. This different conclusion might be explained by changes in clinical characteristics of pregnant women and treatments over the past decades. The increase in cesarean delivery rate, advanced maternal age pregnancy, new pharmacological or mechanical method treatment emerged and then changed clinical course of the disease.

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

Objective: To determine the incidence, indications and risk 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 report databases.

Study group: Pregnant women who had undergone EPH at Sisaket Hospital from January 2012 to June 2015 (total 26 cases) were recruited. All candidates had to have 28 weeks gestational age or more with postpartum hemorrhage within 24 hours after delivery. Additionally, data of those who had normally delivered before (2 patients) and after (2 patients) the study group (total 104 cases) were also recruited as the control group.

Definition

Postpartum hemorrhage: Defined as the loss of 500 ml of blood or more after the completion of the third stage of labor in vaginal delivery or 1,000 ml of blood or more in cesarean delivery.

Emergency peripartum 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 the first and the second stage of labor.

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

Statistical Analysis

The test of association between cases and controls was tested by chi-square test or Fisher's exact. Logistic regression was used to identify related factor on emergency peripartum hysterectomy, the p-value less than 0.05 was considered statistically significant.

Results

There were 17,566 pregnant women with 28 weeks gestational age or more who had delivered in Sisaket Hospital from January 2012 to June 2015. 71 patients (0.40%) had postpartum hemorrhage. Of these, 26 patients had undergone EPH with the

incidence of 1.48 per 1000 deliveries. The incidence of postpartum hemorrhage and EPH per year is demonstrated in Fig. 1.

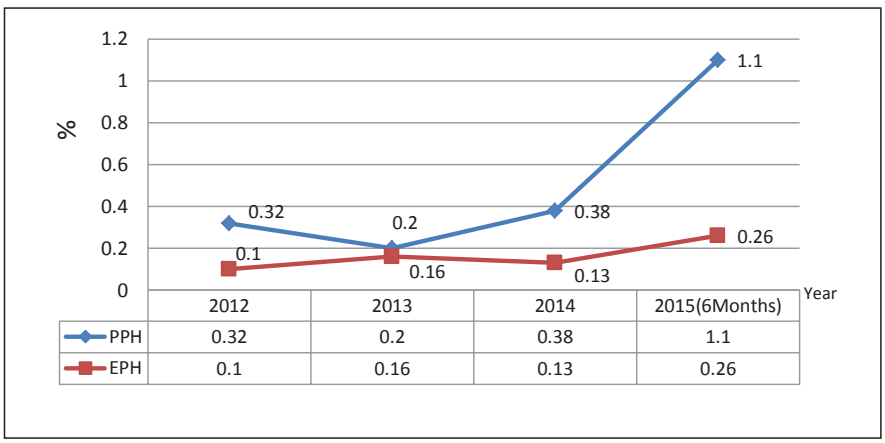

Fig. 1. The incidence of postpartum hemorrhage and emergency peripartum hysterectomy.

Table 1. Timing of EPH.

Timing	Patient (cases, %)
Cesarean hysterectomy	13 (50)
Post cesarean section	4 (15.38)
Post vaginal delivery	9 (34.62)
Total	26 (100)

Of the 26 women included in this study, 13 (50%) had EPH during cesarean delivery, as shown in Table 1. The indications for EPH were placenta adherent (65.38%), uterine atony (26.92%) and uterine rupture (7.69%), as shown in Table 2.

Table 2. The indications for EPH.

Indication	Patient (cases, %)
Placenta adherent	17 (65.38)
Uterine atony*	7 (26.92)
Uterine rupture	2 (7.69)
Total	26 (100)

* Intractable postpartum hemorrhage after pharmacologic and conservative surgical treatment

The results of univariate logistic regression analysis are shown in Table 3, there was statistically significant difference in age ≥ 35 years (crude OR= 8.94, 95% CI 3.36-23.78), Parity ≥ 1 (crude OR = 4.54, 95% CI 1.59-12.94), Placenta previa (crude OR = 13.44, 95% CI 1.34-135.06), Preeclampsia (crude OR = 4.71,

95% CI 1.25-17.75), C/S (crude OR= 4.06, 95% CI 1.64 - 10.07) and gestational age 28-36 weeks (crude OR= 5.95, 95% CI 1.47 - 24.05) in both groups. The analysis of multivariate logistic regression was shown independent risk factors of EPH. Adjusted odd ratio of each variable with 95% CI is presented in Table 4. It could be observed that age ≥ 35 years, cesarean delivery and delivery at gestational age 28 - 36 weeks were significantly associated with EPH.

Table 3. Risk factors for EPH (univariate logistic regression analysis).

Risk factors	Indication		OR	95% CI of OR		P
	EPH	No EPH		Lower	Upper	
Age (years)						
< 35	12 (46.2)	92 (88.5)	1			< 0.001*
≥ 35	14 (53.8)	12 (11.5)	8.94	3.36	23.78	
Parity						
0	5 (19.2)	54 (51.9)	1			0.003*
≥ 1	21 (80.8)	50 (48.1)	4.54	1.59	12.94	
Previous cesarean delivery						
No	22 (84.6)	95 (91.3)	1			0.245
Yes	4 (15.4)	9 (8.7)	1.92	0.54	6.81	
Placenta abruption						
No	25 (96.2)	104 (100)	1			0.200
Yes	1 (3.8)	0	12.29	0.49	310.71	
Placenta previa						
No	23 (88.5)	103 (99.0)	1			0.025*
Yes	3 (11.5)	1 (1.0)	13.44	1.34	135.06	
Preeclampsia						
No	21 (80.8)	99 (95.2)	1			0.027*
Yes	5 (19.2)	5 (4.8)	4.71	1.25	17.75	
Oxytocin						
No	11 (42.3)	45 (43.3)	1			0.929
Yes	15 (57.7)	59 (56.7)	1.04	0.44	2.48	
Route of delivery						
Normal	9 (34.6)	71 (68.3)	1			0.002*
C/S	17 (65.4)	33 (31.7)	4.06	1.64	10.07	
Gestational age (week)						
≥ 37	21 (80.8)	100 (96.2)	1			0.016*
28-36	5 (19.2)	4 (3.8)	5.95	1.47	24.05	

Table 4. Risk factors for EPH (multivariate logistic regression analysis).

Variables	Adjusted OR	95% CI		P
		Lower	Upper	
Age ≥ 35 years	7.53	2.64	21.48	< 0.001
Cesarean delivery	2.86	1.05	7.80	0.04
GA 28-36 weeks	6.06	1.16	31.65	0.033

Table 5 demonstrates the complications in placenta adherent, uterine atony and uterine rupture groups, which were the indications for EPH. From this study, the adherent group had a significantly higher number of previous cesarean delivery (23.53%) and placenta previa (17.65%) than "atony" and "rupture" groups. On the other hand, the "atony" group had a significantly higher number of preeclampsia (28.57%) and abruption placenta (14.28%) than adherent group. 2 maternal deaths had occurred after EPH and all of which had coagulopathy.

Table 5. Obstetric complication associate with EPH divided by indications.*

Obstetric complication	placenta adherent* cases (%) n =17	uterine atony* n = 7	uterine rupture n = 2
Previous cesarean delivery	4 (23.53)	0	0
Preeclampsia	3 (17.65)	2 (28.57)	0
Placenta previa	3 (17.65)	0	0
Placenta abruption	0	1 (14.28)	0
Coagulopathy	4 (23.53)	1 (14.28)	1 (50)
Death	1 (5.88)	1 (14.28)	0
No complication	3 (17.65)	3 (42.85)	1 (50)

* One patient might have more than one complication.

Discussion

The incidence of postpartum hemorrhage in Sisaket hospital was 0.4% which was consistent with the result of many previous studies[6,13,18]. The estimated incidence of EPH in this study was 1.48 per 1000 deliveries, which was in concordance with the USA report[1] (0.8 - 2.28 per 1,000 deliveries) and the Scandinavian report[19] (0.2 - 1.5 per 1,000 deliveries). However, this number was more than the results of many Thai studies (0.25 - 0.96 per 1,000 deliveries)[11,13,14, 20]. The higher estimated incidence might be attributed to a large number of referred postpartum hemorrhage cases. Since the area studied was the only tertiary care center of the province, the number of cases unresponsive to other treatment modalities needed EPH might be higher than other studies, which might be in the area with many tertiary hospitals.

The findings of the present study stated that placenta adherent was the major cause of EPH, which was similar to many studies[7, 8,12,16,17, 21]. For decades, uterine atony had been the leading cause[8, 22]. This change might be due to the introduction of new pharmacologic agents and conservative surgical techniques that help to treat uterine atony effectively. However, alongside the rising cesarean delivery rate and increasing maternal age, there had been a marked increase in the incidence of placenta adherent[11,14,17].

This study had 14 (53.8%) cases of age ≥ 35 years and 4 (15.4%) cases of previous cesarean delivery.

On multivariate logistic regression analysis, clinical characteristics of the EPH group, on comparing to the control group, had odd ratios significantly higher in age ≥ 35 years (P < 0.001), cesarean delivery (P = 0.04) and delivery at GA 28-36 weeks (P = 0.033). In the review by Rossi AC and colleagues[17], he also showed that multiparity, cesarean delivery and placenta previa were risk factors. The difference was that placenta previa could not be considered significant in this study according to multivariate logistic regression analysis. It could be explained that this study might have few cases of placenta previa.

This study found advanced maternal age to be the risk factor, which was supported by Thinkhanmarop J. and colleagues[13]. Preeclampsia, placenta previa and placenta abruption which were most likely to occur in GA 28-36 weeks could predispose uterine atony which could consequently lead to EPH.

On analyzing the indicated causes of EPH, this study found that placenta adherent had association with history of cesarean section, which was similar to previous studies[8,10,11,14]. We proposed that 2D or Doppler ultrasonography should have been done routinely during antenatal care for advanced elderly gravidarum, history of cesarean delivery and placenta previa patients to detect hinder placenta adherent[23,24]. So that physicians could prepare medical team services, blood components and give counseling to the patients and their family prior to the operation. Moreover, the coagulopathy, which was another important factor influencing maternal mortality rate, was also found in this study (23.53% of placental adherent group and 14.28% of uterine atony group).This could be explained by the prolonged conservative treatments after vaginal delivery. Guideline of postpartum hemorrhage should have been implemented for physicians to treat intractable postpartum hemorrhage promptly. This would lead to a decline in maternal mortality.

Conclusion

From the study, the incidence of EPH was 1.48 per 1,000 deliveries. The indications were placenta adherent (65.38%), uterine atony (26.92%) and uterine rupture (7.69%). On multivariate logistic regression analysis, clinical characteristics and risk factors associated with EPH were age ≥ 35 years, cesarean delivery and delivery at GA 28-36 weeks. Placenta adherent was associated with history of cesarean delivery (23.53%) and placenta previa (17.65%). On the other hand, uterine atony was associated with preeclampsia (28.57%) and placenta abruption (14.28%). Placenta adherent had the highest risk of coagulopathy (23.53%) that might cause maternal death. Prompt decision on hysterectomy was suggested to prevent maternal mortality.

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ลักษณะทางคลินิกและปัจจัยเสี่ยงของผู้คลอดที่ต้องผ่าตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอดในโรงพยาบาลศรีสะเกษ

ปิยวัฒน์ อังควะนิช

***หลักการและเหตุผล**: ภาวะตกเลือดหลังคลอดเป็นสาเหตุหลักที่ทำให้มารดาเสียชีวิต แม้ว่าจะมีการพัฒนาคุณภาพยาที่ช่วยในการหดรัดตัวของมดลูก ตลอดจนเทคนิคการผ่าตัด แต่ยังคงมีผู้คลอดบางกลุ่มที่ไม่ตอบสนองต่อการรักษา และจำเป็นต้องให้การรักษาด้วยการผ่าตัดมดลูกฉุกเฉิน ผู้วิจัยจึงสนใจที่จะศึกษาลักษณะทางคลินิกของผู้คลอดที่สัมพันธ์กับการผ่าตัดมดลูกฉุกเฉินในโรงพยาบาลศรีสะเกษ*

***วัตถุประสงค์**: เพื่อหาอุบัติการณ์ ข้อบ่งชี้ ลักษณะทางคลินิกและปัจจัยเสี่ยงที่สัมพันธ์กับการตัดมดลูกฉุกเฉิน*

***รูปแบบการวิจัย**: เป็นการศึกษาแบบ retrospective hospital based descriptive และ case control*

***สถานที่ศึกษา**: กลุ่มงานสูติ-นรีเวชกรรม โรงพยาบาลศรีสะเกษ*

***กลุ่มการศึกษา**: หญิงตั้งครรภ์ที่มีอายุครรภ์ 28 สัปดาห์ขึ้นไปทุกรายที่คลอดที่โรงพยาบาลศรีสะเกษ และได้รับการผ่าตัดมดลูกฉุกเฉินภายใน 24 ชั่วโมงหลังคลอด ในช่วงมกราคม พ.ศ. 2555 – มิถุนายน พ.ศ. 2558 (รวม 26 ราย) ข้อมูลที่ได้จะถูกนำมาวิเคราะห์ทางสถิติเพื่อหาอุบัติการณ์ ข้อบ่งชี้ ลักษณะทางคลินิกและปัจจัยเสี่ยงที่สัมพันธ์กับการตัดมดลูกฉุกเฉิน และภาวะแทรกซ้อนที่พบ กลุ่ม control ได้แก่ หญิงตั้งครรภ์ที่คลอดก่อน และหลังผู้คลอดรายที่ศึกษา โดยใช้ก่อนหน้า 2 ราย และหลัง 2 ราย (รวม 104 ราย) เพื่อประเมินปัจจัยเสี่ยงที่สัมพันธ์กับการตัดมดลูกฉุกเฉิน*

***ผลการศึกษา**: ในช่วงระยะเวลาที่ศึกษามีผู้คลอดที่อายุครรภ์ตั้งแต่ 28 สัปดาห์ขึ้นไป คลอดทั้งสิ้น 17,566 ราย ในจำนวนนี้มี 26 รายที่ได้รับการผ่าตัดมดลูกฉุกเฉินจากภาวะตกเลือดหลังคลอด คิดเป็นอุบัติการณ์ 1.48 ต่อ 1,000 การคลอด เวชระเบียนพบข้อบ่งชี้คือภาวะรกเกาะติดแน่น (ร้อยละ 65.38) มดลูกไม่หดรัดตัว (ร้อยละ 26.92) และมดลูกแตก (ร้อยละ 7.69) จากการวิเคราะห์พหุปัจจัยลักษณะทางคลินิกของผู้คลอดที่เป็นความเสี่ยงอย่างมีนัยสำคัญทางสถิติ ได้แก่ อายุมากกว่าหรือเท่ากับ 35 ปี คลอดโดยการผ่าตัดคลอดและคลอดขณะอายุครรภ์ 28-36 สัปดาห์ มีผู้คลอดเสียชีวิต 2 รายหลังจากได้รับการผ่าตัดมดลูกฉุกเฉิน*

***สรุป**: ลักษณะทางคลินิก และปัจจัยเสี่ยงที่สัมพันธ์กับการผ่าตัดมดลูกฉุกเฉินคือ อายุมากกว่าหรือเท่ากับ 35 ปี คลอดโดยการผ่าตัดคลอด และคลอดขณะอายุครรภ์ 28-36 สัปดาห์*