
OBSTETRICS

Risk Factors Associated with Placenta Previa at Maharat Nakorn Ratchasima Hospital

Amornrat Parijchatt MD,
Phisak Tongswatwong MD.

Department of Obstetrics and Gynecology, Faculty of Medicine, Maharat Nakorn Ratchasima Hospital.

ABSTRACT

Objective: To determine the risk factors associated with placenta previa at Maharat Nakorn Ratchasima Hospital.

Design: Retrospective case control study.

Materials and Methods: This retrospective case control study had recruited 475 singleton pregnancies with placenta previa between January 2003 and December 2007 and another 422 randomly-selected uncomplicated singleton pregnancies as control. Data on potential risk factors for placenta previa development were carefully extracted from medical records, reviewed, and compared with the control group.

Results: The incidence of placenta previa was 1.17%. Factors that significantly associated with placenta previa development were advanced maternal age (odds ratio 2.89, 95%CI 1.99-4.19), previous abortion (odds ratio 2.36, 95%CI 1.68-3.33) and uterine abnormalities (odds ratio 12.79, 95%CI 1.67-97.65). While grand multigravidity was found more frequent in the study group compared to the control group but without statistically significant. On the other hand, history of previous cesarean section was significantly less frequent in women with placenta previa than the control (p -value = 0.0119). Multiple maternal and perinatal morbidities, such as postpartum hemorrhage, blood transfusion, post-partum hysterectomy, fetal distress, low birth weight and preterm birth were increased significantly in the placenta previa group.

Conclusion: Factors significant associated with a placenta previa development were advanced maternal age, previous abortion and uterine abnormalities.

Keywords: risk factors, placenta previa, advanced maternal age

Introduction

Placenta previa complicates approximately about 0.25-0.5% of pregnancy.^(1,2) This condition is a major cause of third-trimester bleeding, postpartum hemorrhage, as well as, maternal and neonatal morbidity and mortality.⁽³⁻⁶⁾

The sharp rising rate in cesarean section,^(4,7,8)

advanced maternal age⁽⁹⁾ and induced abortion were recognized in the past decade. These factors may contribute to the increase incidence of placenta previa.

In previous studies, several risk factors for placenta previa were advanced maternal age, high parity, previous cesarean section, previous abortion, smoking,

assisted reproductive technology and male newborn.⁽¹⁻²¹⁾ The strength of this connection varies from study to study.

This study aimed to determine risk factors of placenta previa at Maharat Nakorn Ratchasima Hospital. Findings arising from this survey could facilitate establishing a management and preventive protocol, with a view to averting possible fatal maternal and neonatal outcomes.

Material and Method

This retrospective case control study reviewed data from Maharat Nakorn Ratchasima Hospital during January 1, 2003 until December 31, 2007. The institution ethics committee had approved this study. Data were collected from medical records. 480 cases of placenta previa were identified, 475 of them were singleton pregnancies and another 5 were twins.

From data, the study had included 475 singleton pregnancies with placenta previa. The diagnosis of placenta previa was identified by transabdominal ultrasound and was confirmed by direct inspection of the location at the time of cesarean section.

Four hundred and fifty pregnant women either delivered vaginally or by cesarean section in the 5-year study period were randomly selected

from the total deliveries of 40,693 cases. Exclusion criteria were multiple gestations and incomplete data. Control group consisted of 422 randomly selected singleton pregnancies.

Medical records were examined carefully for variables, which included maternal age, gravidity, gestational age (correct from both last menstrual period and ultrasound), previous cesarean section, previous abortion, uterine abnormality (such as myoma or uterine septum), sex of the newborn, maternal and neonatal complications.

All analysis were performed with statistical programs. For statistical comparison, Mann-Whitney U-test was used. Dichotomous categorical variables were given as percentages. Differences in the frequencies of events between both groups were analyzed by chi square test. Odds ratio and their 95% confidence intervals were estimated.

Results

During the study period, 480 cases of placenta previa occurred in 41,173 deliveries in Maharat Nakorn Ratchasima Hospital. The incidence of placenta previa was 1.17%. Fig. 1 shows the incidence of placenta previa in each year, while the percentage of different types of placenta previa are shown in Table 1.

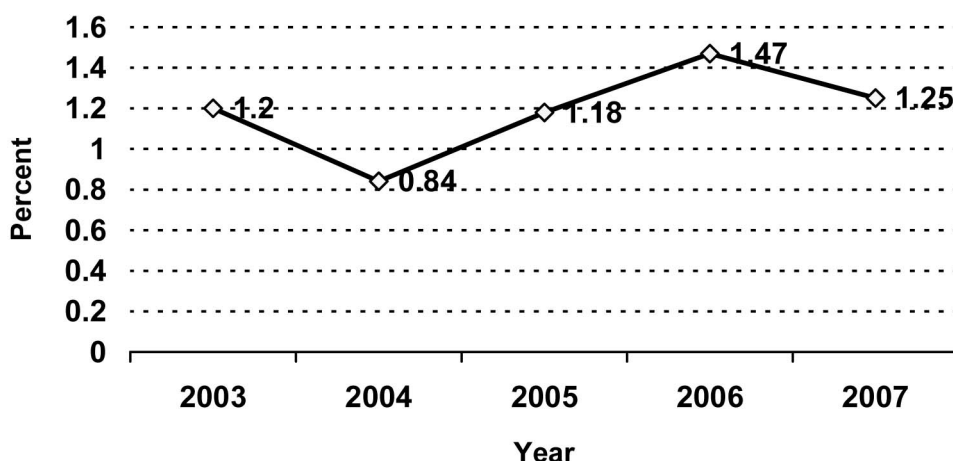


Fig. 1. Incidence of placenta previa

Table 1. Types of placenta previa (N= 475 cases)

Placenta previa	Totalis	Partialis	Marginalis	Low lying
No. of patient	208	109	32	126
%	43	23	7	27

Multiple risk factors for placenta previa development in placenta previa and control group were summarized in Table 2.

After testing for normality of distribution, continuous variables were expressed as median because the distribution was not normal.

The median maternal age of study group was significantly higher than in control group (31 and 26, p value <0.0001). Women with multigravidity (gravidity ≥ 5) had more than 1.62 fold higher risk for placenta

development without statistic significance.

The history of previous abortion, and uterine abnormalities such as leiomyoma or uterine septum were significantly higher in women with placenta previa than in the control group.

There was lower frequency of previous cesarean section in placenta previa group with statistic significance. On the other hand, no association was found between the sex of the newborn and the development of placenta previa.

Table 2. Multiple risk factors for placenta previa development in placenta previa and control group

	No. of patient (%)		p value	Odds ratio (95% CI)
	Study group (n=475)	Control group (n=422)		
Age(years)				
<35	353(74.32)	376(89.10)		1.0
≥ 35	122(25.68)	46(10.90)	< 0.0001	2.89(1.99-4.19)
Multigravidity				
Gravidity<5	457(96.21)	412(97.63)		1.0
Gravidity ≥ 5	18(3.79)	10(2.37)	0.2223	1.62(0.74- 3.56)
Previous abortion				
No	346(72.84)	364(86.26)		1.0
Yes	129(21.16)	58(13.74)	< 0.0001	2.36(1.68-3.33)
Previous cesarean section				
No	441(92.84)	371(87.91)		1.0
Yes	34(7.16)	51(12.09)	0.0119	0.56(0.36- 0.88)
Uterine abnormality				
No	461(97.05)	421(97.76)		1.0
Yes	14(2.95)	1(0.24)	0.0016	12.79(1.67-97.65)
Newborn's sex				
Female	232(48.84)	195(46.21)		1.0
Male	243(51.16)	227(53.79)	0.4305	0.90(0.69- 1.17)

Table 3. Maternal and neonatal complications of placenta previa and control group

	No. of patient (%)		p value	Relative risk (95% CI)
	Study group (n=475)	Control group (n=422)		
Blood Transfusion				
No	335(70.53)	414(98.10)		1.0
Yes	140(29.47)	8(1.90)	< 0.0001	21.63 (10.45-44.74)
Postpartum hemorrhage				
No	407(85.68)	411(97.39)		1.0
Yes	68(14.32)	11(2.61)	< 0.0001	6.24 (3.25-11.98)
Postpartum hysterectomy				
No	463(97.47)	421(99.76)		1.0
Yes	12(2.53)	1(0.24)	0.0042	10.91 (1.41-84.27)
Newborn				
Preterm	219(46.11)	52(12.32)		1.0
Term	256(53.89)	370(87.68)	< 0.0001	6.09 (4.32-8.57)
Low birth weight				
No	341(71.79)	381(90.28)		1.0
Yes	134(28.21)	41(9.72)	< 0.0001	3.65 (2.50-5.33)
Fetal distress (Apgar score at 1 min.≤ 7)				
No	382(80.42)	404(95.73)		1.0
Yes	93(19.58)	18(4.27)	< 0.0001	5.46 (3.24-9.23)

Maternal and neonatal complications of placenta previa and control group were summarized in Table 3.

Maternal complications that significantly associated with placenta previa were blood transfusion, postpartum hemorrhage and postpartum hysterectomy. The median days of hospital stay for placenta previa group was significantly higher than the control group (5 days and 3 days, p value <0.0001). All of the placenta previa were delivered by

cesarean section.

Neonatal complications that significantly associated with placenta previa were preterm, low birth weight and fetal distress (Apgar score at 1 min.≤ 7).

Discussion

The incidence of placenta previa at Maharat Nakhon Ratchasima Hospital was 1.17%. The incidence was about the same during 2003 and 2007 (1.2-1.25%).

This supports other studies that had been previously reported in Thailand. At Chulalongkorn Hospital (1996-2000)⁽¹⁾, Songklanagarind Hospital (1998)⁽²⁾, Maharat Nakorn Chiang Mai (2000)⁽²⁾, Srinagarind Hospital (2000)⁽²⁾, the incidences of placenta previa were 0.89%, 1.3%, 1.03%, and 1.16% respectively, which were much higher than other international reports.^(3-7,11,12,14-17) These may be due to the fact that studies in Thailand were performed by the tertiary referral centers.

The fact that low insertion type accounts for 27% of all placenta previa in this study group, it may be a factor that causes result deviations due to the different inclusion or exclusion criterion.⁽¹¹⁾

In the present study, all the placenta previa patients were delivered by cesarean section, while the control group delivered by cesarean section in 36.97%.

The present study found a significant increase in the incidence of placenta previa in women older than 35 years with statistical significance (odds ratio 2.89, 95% CI 1.99-4.19). This result is similar to other previous studies.^(3,7,9) The actual pathophysiology is unknown, however it may be related to reduction of blood supply to placenta due to sclerotic changes in intramyometrial arteries which increase with increasing age.⁽¹²⁾

Women with multigravity (gravidity ≥ 5) had more than 1.62 fold higher risk for placenta previa development without statistical significance (odds ratio 1.62, 95%CI 0.74-3.56). This result was similar to other previous studies^(5,7,13,14) It may be due to the small number of pregnant women in multigravity group (38 pregnant women) making without statistical significance.

Previous abortions, either spontaneous or induced, were significantly higher in placenta previa group than the control group, which corresponded to 2.36 fold higher risk for placenta previa development (odds ratio 2.36, 95%CI 1.68-3.33). This result was similar to other previous studies.^(3,7,15,16) It may be explained by endometrial damage from abortion. However, some reports had shown different results⁽¹³⁾, this may be due to the different methods and causes of abortion.

Women with placenta previa had significantly

lower pervallence of previous cesarean section than control cases (odds ratio 0.56, 95% CI 0.36-0.88). This result was inconsistent with many studies^(3-5,7,14,15,17,18). According to the other several confounding factors, affect test result deviated.

Uterine abnormalities, such as myoma or uterine septum, were significantly higher in women with placenta previa than control group (odds ratio 12.79, 95% CI 1.67-97.65). This result was supported by the study of Rasmussen S, et al⁽¹⁹⁾ and Qidwai GI, et al.⁽²⁰⁾

The association between male newborn and placenta previa remains in question^(7,21) The present study, male newborn had lower risk of placenta previa without statistic significance (odds ratio 0.90, 95%CI 0.69- 1.17).

Postpartum hemorrhage was significantly associated with placenta previa (relative risk 6.24, 95%CI 3.25-11.98), but this result may have some error regarding inaccurate assessment of blood loss. Similarly, blood transfusion (relative risk 21.63, 95%CI 10.45-44.74) and postpartum hysterectomy (relative risk 10.91, 95%CI 1.41-84.27) were significantly higher in placenta previa than control group. These results were similar to other previous studies.^(3,4)

Neonatal complications that significantly associated with placenta previa were preterm birth (relative risk 6.09, 95%CI 4.32-8.57), low birth weight (relative risk 3.65, 95%CI 2.50-5.33) and fetal distress (relative risk 5.46, 95%CI 3.24-9.23). These results were similar to other previous studies.^(3,6)

The drawback of this study is that this design is a retrospectively study. Some data may have been wrongly recorded, while some may have been lost. Some of the useful data are unable to collect such as smoking, ART and history of abortion. In the future, prospective study should be done so that some variables can be controlled.

The results of this study indicate that knowing obstetric predisposing factors of women for placenta previa development in our population is important for choosing adequate surveillant measure for these women. Careful monitoring of these high risk pregnancies is importance, especially regarding careful ultrasonographic examination with exact

placenta location during the second trimester of pregnancy. Early recognition and proper monitoring of placenta previa could minimize the possibility of poor outcome in sudden massive vaginal bleeding.

In conclusion, the incidence of placenta previa in Maharat Nakorn Ratchasima Hospital was 1.17%. Factors that significantly associated with placenta previa development were advanced maternal age, history of abortions and presence of uterine abnormalities.

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ปัจจัยเสี่ยงที่พบร่วมกับภาวะรกเกาะต่ำที่โรงพยาบาลมหาราชนครราชสีมา

อมรรัตน์ ปาจิณต์, พิเศษ ทองสวัสดิวงศ์

วัตถุประสงค์ : เพื่อศึกษาปัจจัยเสี่ยงที่สัมพันธ์กับภาวะรกเกาะต่ำที่โรงพยาบาลมหาราชนครราชสีมา

ชนิดของการศึกษา : การศึกษาย้อนหลังแบบ case control

วัสดุและวิธีการ : ทบทวนเวชระเบียนของสตรีตั้งครรภ์ที่มีภาวะรกเกาะต่ำ 475 ราย ที่มาคลอดบุตรที่โรงพยาบาลมหาราชนครราชสีมา ในช่วงเวลาดังกล่าวตั้งแต่ 1 มกราคม 2546 ถึง 31 ธันวาคม 2550 และนำไปเปรียบเทียบกับข้อมูลกลุ่มควบคุมโดยการสุ่มจากสตรีตั้งครรภ์ครรภ์เดียวที่ไม่มีภาวะแทรกซ้อนและเข้ารับการรักษาในโรงพยาบาลในช่วงเวลาดังกล่าวทำการรวบรวมข้อมูลต่างๆ เกี่ยวกับ ข้อมูลทั่วไป ข้อมูลการคลอด ผลการคลอด และบันทึกข้อมูลในแบบบันทึกข้อมูลที่จัดทำขึ้น จากนั้นจึงนำข้อมูลที่ได้ไปวิเคราะห์

ผลการศึกษา : อุบัติการณ์ของสตรีตั้งครรภ์ที่มีรกเกาะต่ำเท่ากับร้อยละ 1.17 พบว่า ปัจจัยสำคัญที่สัมพันธ์กับภาวะรกเกาะต่ำอย่างมีนัยสำคัญทางสถิติได้แก่ อายุมาก (odds ratio 2.89, 95%CI 1.99-4.19), มีประวัติเคยแท้ง (odds ratio 2.36, 95%CI 1.68-3.33), มดลูกมีความผิดปกติ (odds ratio 12.79, 95%CI 1.67-97.65) ส่วนจำนวนตั้งครรภ์ตั้งแต่ 5 ครั้งขึ้นไป และพบเพิ่มความเสี่ยงรกเกาะต่ำมากกว่าแต่ไม่มีนัยสำคัญทางสถิติ สตรีที่มีประวัติเคยผ่าตัดคลอดพบมีความเสี่ยงรกเกาะต่ำน้อยกว่ากลุ่มควบคุมที่ไม่เคยผ่าคลอด (chi square= 6.33, p value = 0.0119) ส่วนผลกระทบที่เกิดจากรกเกาะต่ำได้แก่ ภาวะตกเลือดหลังคลอด การให้เลือด การตัดมดลูกหลังคลอด ภาวะ fetal distress ทารกแรกเกิดน้ำหนักน้อยและทารกคลอดก่อนกำหนด พบมากกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ

สรุป : ปัจจัยสำคัญที่พบร่วมกับภาวะรกเกาะต่ำอย่างมีนัยสำคัญทางสถิติได้แก่ อายุมาก มีประวัติเคยแท้ง และมดลูกมีความผิดปกติ
