Pregnancy Outcomes in Placental Abruption

Amornrath Pitaphrom MD*,
Nares Sukcharoen MD*

** Department of Obstetrics & Gynecology, Faculty of Medicine, Chulalongkorn University*

Objectives: *To determine the outcomes of pregnancies with placental abruption and to investigate the relationship between clinical maternal characteristics and poor perinatal outcomes.*
Material and Method: *A retrospective descriptive study was conducted to evaluate 103 cases of placental abruption delivered at King Chulalongkorn Memorial Hospital from 1995 to 2004.*
Results: *There were 111,375 singleton deliveries with 103 cases (0.92 in 1000) complicated by placental abruption during the study period. Placental abruption attributed to maternal complications including hemorrhagic shock (19.4%), Couvelaire uterus (16.5%) and DIC (5.8%). The perinatal outcomes included low birth weight (65.0%), preterm (56.3%), severe birth asphyxia (16.5%) and perinatal death (16.5%). Placental abruption with pregnancy induced hypertension (PIH), DIC and blood transfusion had a significantly higher incidence of perinatal mortality than the remainder (odds ratio [OR] 4.16, 95% confidence interval [CI] 1.41-12.24; OR 12.92, 95%CI 2.15-77.80 and OR 3.93, 95%CI 1.27-12.19, respectively). Placental abruption with Couvelaire uterus had a significantly higher incidence of severe birth asphyxia than the remainder (OR 3.72, 95%CI 1.14-2.09).*
Conclusion: *Placental abruption had a profound impact on both maternal and perinatal complications including DIC, Couvelaire uterus, severe birth asphyxia and perinatal death. The relationship between PIH, DIC, blood transfusion and Couvelaire uterus with poor perinatal outcomes were found. Therefore, placental abruption with these clinical characteristics should be closely monitored and prompt delivery should be carried out at tertiary care centers with adequate maternal-neonatal intensive care facilities.*

Keywords: *Placental abruption, Pregnancy outcomes, Birth asphyxia, Perinatal death, Low birth weight*

J Med Assoc Thai 2006; 89 (10): 1572-8
Full text. e-Journal: *http://www.medassocthai.org/journal*

Placental abruption is a serious obstetric condition that increases maternal and neonatal morbidity and mortality. Maternal complications include hemorrhagic shock, coagulopathy and disseminated intravascular coagulation (DIC), uterine rupture, renal failure, ischemic necrosis of distal organs and death. Neonatal complications include prematurity, birth asphyxia, fetal growth retardation and stillbirth[1].

However, little is known about clinical characteristics that influence the poor perinatal outcomes in pregnancies with placental abruption. In the present study, the authors designed the retrospective descriptive study to achieve two objectives. The objectives of the present study were to describe the obstetric and perinatal outcomes of a 10-year cohort of pregnancies with placental abruption and to evaluate the clinical characteristics and complications of patients who developed placental abruption leading to a poor perinatal outcomes in the study patient population to identify the clinical characteristics that contributed to perinatal morbidity and mortality.

Corespondence to : Sukcharoen N, Department of Obstetrics & Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand. Phone: 0-2256-4241, 0-1643-4592, Fax: 0-2254-9292, E-mail: Sukcharoen@yahoo.com

Material and Method

The present study consisted of a retrospective review of the medical records of all patients who were admitted with a diagnosis of placental abruption from January 1, 1995, to December 31, 2004, at King Chulalongkorn Memorial Hospital. All computerized medical records were searched for the diagnosis of placental abruption according to code O45 of Inter-

national Classification of Diseases 10 (ICD10). The identified charts were assessed to confirm the diagnosis based on gross clinical examination of the placenta by attending obstetricians at the time of delivery. Inclusion criteria were a singleton pregnancy with more than 28 weeks of gestation. Exclusion criteria included the presence of placenta previa and the presence of a multiple gestation.The record of each case composing of the maternal and neonatal data was reviewed and collected in the data collecting form.

Detailed information was collected regarding the maternal characteristics including demographic data, e.g., maternal age, race, parity, gestational age (GA) at admission, history of smoking and substance abuse, past obstetric history including a history of a previous pregnancy with placental abruption, any current obstetric complications, e.g. chronic hypertensive disease, pregnancy induced hypertension (PIH), preterm labor, preterm premature rupture of membranes, presenting symptoms, pertinent physical examination, investigation performed, type of delivery, time to delivery, estimated blood loss, blood transfusion or antibiotics needed, complications and the length of hospital days.

Neonatal outcome data were recorded including GA at delivery, birth weight, interval from admission to delivery, Apgar score at 1 minute and 5 minutes and length of neonatal hospital stay (days). Perinatal outcomes evaluated were low birth weight (LBW: live born infant weighing < 2,500 g at birth), neonatal death (death of a live born infant within the first 28 days of life), fetal death (delivery of a dead fetus at or after 28 weeks of gestation), perinatal mortality (combination of stillbirth and neonatal death).

Statistical analysis

Descriptive statistics were generated for all study variables including means, standard deviations, medians, and ranges for continuous variables, and relative frequencies for categorical variables. For continuous data, Kolmogorov-Smirnov test was used to determine whether the data followed Gaussian distribution, and the Student *t* test or Mann-Whitney U test was used where applicable. Odds ratios (ORs) with 95% confidence intervals (CI) were computed as measures of association between each clinical characteristics and poor perinatal outcome considered. Rates of low birth weight, poor perinatal outcomes included severe birth asphyxia, stillbirth and neonatal death were calculated for each clinical characteristics compared with the remainder without these clinical characteristics. Statistical comparisons were made using c^2 for categorical variables. A *p*-value of less than 0.05 was considered statistically significant. Statistical analysis was carried out using SPSS 12.0 (SPSS Inc, Chicago, IL).

Results

During the years 1995-2004, there were 143 singleton births with the diagnosis of placental abruption in King Chulalongkorn Memorial Hospital, of which, forty cases were excluded from the diagnosis of placenta previa, gestational age less than 28 weeks, missing data on examination of the placenta or neonatal data, leaving 103 cases for analyses.

One hundred and three cases of placental abruption were in singletons among the 111,375 singleton deliveries during the study period (0.92 in 1000). Demographic and clinical characteristics of placental abruption patients are shown in Table 1. The mean maternal age of the cases recruited was 27.2 $\pm$ 6.5 years. 52.4% were the primigravida. 30.1% had pregnancy induced hypertension, and 8.7% had premature rupture of membranes. 6.8% were substance abusers and smokers. The mean gestational age was 35.3 $\pm$ 3.4 weeks. Common associated presentations included vaginal bleeding (31.1%), hypertonic uterine contraction or tenderness (30.1%), or back pain (12.6%). Fifty-nine cases underwent ultrasonographic evaluation, but only 11 cases were diagnosed as placental abruption (18.6%). 84.5% of the cases were delivered by cesarean section.

Maternal and neonatal data are shown in Table 2. The mean birth weight was 2,269.4 $\pm$ 737.7 grams. Sixty-seven neonates were born with low birth weight (65.1%). Fifty-eight neonates were delivered prematurely (56.3%), out of which the mean gestational age was 32.8 $\pm$ 2.2 weeks and the mean birth weight was 1,847.2 $\pm$ 588.8 grams. Among the premature neonates, 44.1% experienced severe birth asphyxia with the consequence of three neonatal death; whereas, 55.9% had mild to moderate asphyxia.

The overall stillbirth, neonatal mortality and perinatal mortality of singleton deliveries during the study period were 5.6, 5.2 and 10.8 deaths per 1,000 live births, respectively. Stillbirth, neonatal mortality and perinatal mortality were 126.2, 38.8 and 165.0 death per 1,000 live births for placental abruptions, respectively. The stillbirth, neonatal mortality and perinatal mortality in placental abruptions increased 22.5, 7.5 and 15.3 times, respectively when compared with the general population.

Maternal complications included Couvelaire uterus, DIC and shock (16.5%, 5.8% and 2.9%, respectively) (Table 3). 19.4% of all cases needed blood transfusion, which was significantly associated with stillbirth and neonatal death. There was no maternal death.

Placental abruption with PIH had a significantly higher incidence of low birth weight and perinatal mortality than the non PIH group (odds ratio [OR] 4.2, 95% confidence interval [CI] 1.5-12.1; $p < 0.05$ and OR 4.2, 95%CI 1.4-12.2, respectively). Moreover, placental abruption with DIC and blood transfusion had a significantly higher incidence of perinatal mortality than the remainder (OR 12.9, 95%CI 2.2-77.8 and OR 3.9, 95%CI 1.3-12.2, respectively). Placental abruption with Couvelaire uterus had a significantly higher incidence of severe birth asphyxia than the remainder (OR 3.7, 95%CI 1.1-2.1) (Table 4).

Discussion

Placental abruption, defined as placental detachment before delivery of normal implantation, occurs in about 5.9 to 6.5 per 1,000 singleton births[1-4] and 12.2 per 1,000 twin births[4]. In a recent study, plurality (number of fetuses per pregnancy) increases risk from 1 to 3, the risk of placental abruption rises, whereas the risk of abruption-associated perinatal

Table 1. Demographic and clinical characteristics of studying cases

Characteristics	Cases (n = 103)
Maternal age (y)	
<20	12 (11.7%)
20-24	32 (31.1%)
25-29	24 (23.3%)
30-34	19 (18.4%)
≥35	16 (15.5%)
Parity	
0	54 (52.4%)
1-3	47 (45.6%)
≥4 2 (2.0%)	
Maternal complications	
Pregnancy induced hypertension (PIH)	31 (30.1%)
Severe pre-eclampsia	18 (17.5%)
Mild pre-eclampsia	12 (11.7%)
Superimposed hypertension	1 (0.9%)
PROM*	9 (8.7%)
Previous cesarean section	8 (7.8%)
Cigarette smoking and substance abuse	7 (6.8%)
Chronic hypertension	1 (0.9%)
Clinical presentations	
Vaginal bleeding	32 (31.1%)
Tetanic uterine contraction	31 (30.1%)
Uterine tenderness	13 (12.6%)
PROM*	6 (5.8%)
Preterm labor	5 (4.8%)
Decreased fetal movement	4 (3.9%)
Others	12 (11.7%)
Ultrasonography	59 (57.3%)
Negative	48 (81.3%)
Positive	11 (18.6%)
Route of delivery	
Cesarean section	87 (84.5%)
Normal delivery	16 (15.5%)
Blood transfusion	20 (19.4%)

* PROM: premature rupture of membranes

Table 2. Maternal and neonatal data

Gestational age at delivery (wk)	35.3 ± 3.4
Birth weight (gms)	2,269.4 ± 737.7
Length of maternal hospital stay (days)*	5 (2-16)
Length of neonatal hospital stay (days)*	6 (0-118)
Estimated blood loss (ml)*	600 (200-1,500)
Time interval between admission and birth (hours)*	3hr 51min (23min-192 hr)

* Data as median with range

Table 3. Maternal and perinatal outcomes and complications

	Cases (n = 103)
Maternal complications	
Couvelaire uterus	17 (16.5%)
DIC	6 (5.8%)
Hemorrhagic shock	3 (2.9%)
Perinatal outcomes	
Poor perinatal outcomes*	31 (30.1%)
Perinatal death	17 (16.5%)
Stillbirth	13 (12.6%)
Neonatal death	4 (3.8%)
Preterm birth	58 (56.3%)
Birth asphyxia (BA)	49 (47.6%)
Mild/moderate BA	32 (31.1%)
Severe BA	17 (16.5%)
Low birth weight (LBW)	67 (65.1%)

* Poor perinatal outcomes included stillbirth, severe birth asphyxia, and neonatal death

Table 4. Odds ratio for poor perinatal outcomes according to maternal variables

	Odds ratio (95%CI)		
	Low birthweight	Severe birth asphyxia	Stillbirth/neonatal death
Maternal predisposing factors			
PIH	4.2 (1.5, 12.1)*	0.4 (0.1, 1.6)	4.2 (1.4, 12.2)*
PROM	0.4 (0.1, 1.6)	0.6 (0.1, 5.2)	0.8 (0.8, 0.9)
Smoking	1.6 (0.2, 16.4)	1.7 (0.2, 17.7)	5.6 (0.7, 42.9)
Clinical presentations			
Vaginal bleeding	1.3 (0.5, 3.1)	1.8 (0.6, 5.0)	0.4 (0.1, 1.6)
Tetanic uterine contraction	0.7 (0.3, 1.6)	0.7 (0.2, 2.3)	0.7 (0.2, 2.3)
Route of delivery			
Vaginal route	2.7 (0.7, 10.0)	0.7 (0.1, 3.3)	2.8 (0.8, 9.6)
Cesarean section	0.4 (0.1, 1.4)	1.5 (0.3, 7.1)	0.4 (0.1, 1.2)
Maternal complications			
DIC	2.8 (0.3, 25.1)	0.8 (0.8, 0.9)	12.9 (2.2, 77.8)*
Couvelaire uterus	1.0 (0.3, 2.9)	3.7 (1.1, 2.1)*	2.6 (0.8, 8.6)
Shock	1.1 (0.1, 12.3)	2.6 (1.1, 2.1)	11.3 (1.0, 133.0)*
Blood transfusion	1.3 (0.5, 12.3)	2.0 (0.6, 6.4)	3.9 (1.3, 12.2)*

* Statistically significant

mortality declines[5]. In the present study, the topic of interest is the risk factors of poor perinatal outcome in the placental abruption cases, therefore only those in singleton were recruited because of its higher perinatal mortality and homogeneity of the study population.

This wide range in reported incidence rates may be explained partly by the differing criteria for diagnosing placental abruption as well as the increased recognition of milder forms of the event, i.e., the separation of the placenta from the uterine wall can be complete, partial, or marginal (involving only the placental margin). Complete detachment of the placenta from the uterus is more likely to result in a fetal death than partial or marginal separation[4], while a marginal abruption may be undetected.

The accurate identification of placental abruption cases is the primary limitation in most studies. The number of placental abruption cases is influenced by potential under-reporting of mild cases that may be easily possibly neglected. In addition, the definitive diagnosis of placental abruption may occur after pathological examination, so information on the final diagnosis may not be available when data abstracting is retrospectively conducted as in the present study. These would underestimate the authors' reported incidence (0.92 per 1,000 singleton births).

The primary etiology for placental abruption is still unclear, but several risk factors have been identified, including pre-eclampsia, chronic hypertension, previous history of placental abruption, increased maternal age, cigarette smoking, and cocaine use[1,2,4,6-8]. It has also been hypothesized that the etiology for a marginal or partial placental abruption may differ from that of a complete type[4]. The incidence of placental abruption is higher in pregnancies complicated by hypertensive disorders with increasing risk in some specific types of hypertension. Many authors have found a strong association between chronic hypertension and placental abruption[2,9]. Moreover, in the present study, the most common maternal predisposing conditions were pregnancy induced hypertension (30.1%) and severe preeclampsia was frequently associated with placental abruption. In a previous study, severity of hypertensive disease greatly influenced the risk of placental abruption [2]. Relative risk of placental abruption was 3.8 in patients with severe preeclampsia[6]. Only one patient was found with chronic hypertension. These findings are in agreement with other studies[10,11].

Placental abruption can be contributed to a serious pregnancy complication of both mother and infant. It is associated with an increased incidence of preterm delivery as well as maternal and perinatal morbidity. Several complications occurred in patients presenting with placental abruption including Couvelaire uterus (16.5%), DIC (5.8%) and hemorrhagic shock (2.9%). 19.4% of the presented patients required blood transfusion, but none of them ended with hysterectomy or renal failure or death.

Perinatal mortality rates in pregnancies with placental abruption range from about 10-20%[3,12]. Perinatal mortality rate was reported to be 119 per 1000 births complicated by abruption, compared with 8.2 per 1000 among all other births[6]. In the present study, the perinatal mortality rate was 165 per 1000 births complicated by abruption, compared with 10.8 per 1000 among all other births during the study period. The incidence was lower but perinatal mortality was higher than the previous reports, it may be because only severe cases were recruited in the present study.

Neonatal morbidity also increased significantly. In the present study, the incidence of preterm birth, and birth asphyxia were 56.3% and 47.6%, respectively. Placental abruption is the major cause of an umbilical artery pH of less than 7.0 at birth[13] and, causes more severe and prolonged hypoxia than cord prolapse[14].

Placental abruption has various presentations and severities, therefore the maternal and perinatal outcomes are different. Because the placental abruption is related not only to preterm birth but also to perinatal death and sequel from perinatal asphyxia, the study of the factors contributed to these poor outcomes should be investigated to better understand its pathophysiology and to facilitate future investigation for prevention of the serious sequel. Determining the poor perinatal outcomes in the placental abruption patients remains a challenge. In severe placental abruption complicated by fetal bradycardia, a decision to delivery interval of 20 minutes or less was associated with substantially reduced neonatal morbidity and mortality[15]. However, bradycardia is a very late sign. It is inevitable to decide prompt delivery without hesitation.

Although, hypertensive women experiencing placental abruption were shown to be more likely to have higher-grade placental abruption and lower umbilical cord pH values in another study, but the overall perinatal outcome was not significantly different from that with normotensive group[16]. However, in the present study, the placental abruption patients with PIH had a 4-fold increased risk of stillbirth/neo-

natal death compared with those without PIH (OR 4.16, 95%CI 1.41-12.24).

In a previous epidemiological study, the conditions that decreased exchange capacity of the placenta e.g. smoking and severe preeclampsia correlated with perinatal deaths. They suggested that in cases of abruptio placenta a general impairment of the placenta and/or a defect in placentation might be fatal [17]. However, the authors could not find any contribution from these factors in the present study. It was found that poor perinatal outcome in placental abruption was strongly related to Couvelaire uterus, DIC and blood transfusion. These findings were consistent with hypotheses that massive retroplacental hemorrhage, which cause Couvelaire uterus, might interfere with uteroplacental blood flow and finally caused severe birth asphyxia.

Optimal outcomes were most likely to arise from treatment by a team of experienced obstetricians, hematologists, and neonatologists. Correction of PIH, DIC, Couvelaire uterus and blood transfusion requirement were identified as a possible predictor of poor perinatal outcome. The role of PIH in placental abruption should still be further explored.

The importance of the present study is emphasized by the large number of study groups, and the review of all clinical characteristics to investigate the risk factors of poor obstetric and perinatal outcomes. Much information that was gained from the present study may be helpful to clinicians. First, it allows for thorough counseling, especially in patients with PIH. Next, the results suggest that an increased in PIH results in poor perinatal outcome. This fact should encourage physicians to plan for prompt management and delivery at a facility equipped to handle perinatal care for placental abruption patients.

The authors acknowledge the limitations of the present study because of the retrospective nature of the data collection, predisposed toward selection bias, and diagnostic inconsistencies of the practitioners who were involved. The uniform clinical practices of the practitioners in the group help to minimize, but not eliminate, these potential confounders.

In conclusion, placental abruption had a profound impact on both maternal and perinatal complications, causing Couvelaire uterus, DIC, shock, and blood transfusion in the pregnant women and stillbirth, preterm delivery, birth asphyxia, and low birth weight in the neonates. The present study revealed that in the cases accompanied with PIH, DIC and Couvelaire uterus, perinatal death and severe birth asphyxia occurred more frequently. Therefore, severe concealed bleeding presented as Couvelaire uterus, DIC, and blood transfusion requirement correlated with poor perinatal outcomes including severe birth asphyxia and perinatal death. Placental abruption with these clinical characteristics should be closely monitored with appropriate intrapartum management at tertiary care centers with adequate maternal-neonatal intensive care facilities whenever possible.

References

1. Hladky K, Yankowitz J, Hansen WF. Placental abruption. Obstet Gynecol Surv 2002; 57: 299-305.
2. Ananth CV, Savitz DA, Williams MA. Placental abruption and its association with hypertension and prolonged rupture of membranes: a methodologic review and meta-analysis. Obstet Gynecol 1996; 88: 309-18.
3. Rasmussen S, Irgens LM, Bergsjo P, Dalaker K. The occurrence of placental abruption in Norway 1967-1991. Acta Obstet Gynaecol Scand 1996; 75: 222-8.
4. Ananth CV, Berkowitz GS, Savitz DA, Lapinski RH. Placental abruption and adverse perinatal outcomes. JAMA 1999; 282: 1646-51.
5. Salihu HM, Bekan B, Aliyu MH, Rouse DJ, Kirby RS, Alexander GR. Perinatal mortality associated with abruption placenta in singletons and multiples. Am J Obstet Gynecol 2005; 193: 198-203.
6. Ananth CV, Smulian JC, Demissie K, Vintzileos AM, Knuppel RA. Placental abruption among singleton and twin births in the United States: risk factor profiles. Am J Epidemiol 2001; 153: 771-8.
7. Misra DP, Ananth CV. Risk factor profiles of placental abruption in first and second pregnancies: Heterogeneous etiologies. J Clin Epidemiol 1999; 52: 453-61.
8. Kramer MS, Usher RH, Pollack R, Boyd M, Usher S. Etiologic determinants of abruptio placentae. Obstet Gynecol 1997; 89: 221-6.
9. Sibai BM, Lindheimer M, Hauth J, Caritis S, VanDorsten P, Klebanoff M, et al. Risk factors for preeclampsia, abruptio placentae, and adverse neonatal outcomes among women with chronic hypertension. N Engl J Med 1998; 339: 667-71.
10. Odendaal HJ, Hall DR, Grove D. Risk factors for and perinatal mortality of abruptio placentae in patients hospitalised for early onset severe preeclampsia - a case controlled study. J Obstet Gynecol 2000; 20: 358-64.
11. Hall DR, Odendaal HJ, Steyn DW, Grove D. Ex-

pectant management of early onset, severe pre-eclampsia: maternal outcome. BJOG 2000; 107: 1252-7.
12. Williams MA, Lieberman E, Mittendorf R, Monson RR, Schoenbaum SC. Risk factors for abruptio placentae. Am J Epidemiol 1991; 134: 965-72.
13. Sehdev HM, Stamilio DM, Macones GA, Graham E, Morgan MA. Predictive factors for neonatal morbidity in neonates with an umbilical arterial cord pH less than 7.00. Am J Obstet Gynecol 1997; 177: 1030-4.
14. Johnson JW, Richards DS. The etiology of fetal acidosis as determined by umbilical cord acid-base studies. Am J Obstet Gynecol 1997; 177: 274-82.
15. Kayani SI, Walkinshaw SA, Preston C. Pregnancy outcome in severe placental abruption. BJOG 2003; 110: 679-83.
16. Morgan MA, Berkowitz KM, Thomas SJ, Reimbold P, Quilligan EJ. Abruptio placentae: perinatal outcome in normotensive and hypertensive patients. Am J Obtet Gynecol 1994; 170: 1595-9.
17. Kyrklund-Blomberg N, Gennser G, Cnattingius S. Placental abruption and perinatal death. Paediatr Perinat Epidemiol 2001; 15: 290-7.

ผลการตั้งครรภ์ในภาวะรกลอกตัวก่อนกำหนด

อมรรัตน์ ปิตะพรหม, นเรศร สุขเจริญ

วัตถุประสงค์*: ศึกษาผลการตั้งครรภ์ในผู้ป่วยรกลอกตัวก่อนกำหนด และศึกษาความสัมพันธ์ระหว่างลักษณะทางคลินิกของมารดากับผลการคลอด*

วัสดุและวิธีการ*: ได้ทำการศึกษาย้อนหลังในสตรีตั้งครรภ์ 103 รายที่มีภาวะรกลอกตัวก่อนกำหนดซึ่งคลอดที่โรงพยาบาลจุฬาลงกรณ์ในระหว่างปี พ.ศ. 2538 - พ.ศ. 2547*

ผลการศึกษา*: มีการคลอดครรภ์เดี่ยวทั้งหมด 111,375 ราย ในช่วงที่ทำการศึกษา โดยพบว่ามีภาวะรกลอกตัวก่อนกำหนดทั้งหมด 103 ราย (0.92 ใน 1000) ภาวะรกลอกตัวก่อนกำหนดทำให้เกิดภาวะแทรกซ้อน เช่น ภาวะช็อกจากการเสียเลือด (19.4%), Couvelaire uterus (16.5%) และ DIC (5.8%) ทารกหลังคลอดมีน้ำหนักตัวน้อย (65.0%), คลอดก่อนกำหนด (56.3%), ขาดออกซิเจนรุนแรงขณะคลอด (16.5%) และมีการตายของทารกในช่วงปริกำเนิด (16.5%) ในสตรีตั้งครรภ์ที่มีรกลอกตัวก่อนกำหนดซึ่งพบร่วมกับความดันโลหิตสูงขณะตั้งครรภ์ (PIH), DIC และการให้เลือด พบว่ามีอุบัติการณ์ของอัตราตายของทารกในครรภ์เพิ่มขึ้นกว่าในกลุ่มที่ไม่มีภาวะดังกล่าว (odds ratio [OR] 4.16, 95% confidence interval [CI] 1.41-12.24; OR 12.92, 95%CI 2.15-77.80 และ OR 3.93, 95%CI 1.27-12.19, ตามลำดับ) ในสตรีตั้งครรภ์ที่มีรกลอกตัวก่อนกำหนดซึ่งพบร่วมกับ Couvelaire uterus พบว่ามีอุบัติการณ์ของการขาดออกซิเจนอย่างรุนแรงในระหว่างคลอด เพิ่มขึ้นกว่าในกลุ่มที่ไม่มีภาวะดังกล่าว (OR 3.72, 95%CI 1.14-2.09)*

สรุป*: ภาวะรกลอกตัวก่อนกำหนดมีภาวะแทรกซ้อนและผลเสียร้ายแรงต่อมารดาและทารก เช่น DIC, Couvelaire uterus, การขาดออกซิเจนอย่างรุนแรงในขณะคลอด และการตายในช่วงปริกำเนิด ดังนั้นภาวะรกลอกตัวก่อนกำหนดที่มีลักษณะทางคลินิกดังกล่าวควรได้รับการดูแลอย่างใกล้ชิดและควรทำการคลอดในสถานพยาบาลที่มีความสามารถในการดูแลมารดาและทารกแรกคลอดได้เป็นอย่างดี*