

# Prevalence of Pregnancy with Placenta Previa in Siriraj Hospital

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## ABSTRACT

**Objective:** To determine the prevalence of pregnancy with placenta previa in Siriraj Hospital.

**Methods:** This study conducted a retrospective review of in-patients medical records of a total of 843 singleton deliveries in Siriraj Hospital with gestational age  $\geq 28$  weeks during January to February 2009. Data on baseline characteristics of pregnant women, pregnancy course and the outcomes during delivery were collected. Placenta previa was diagnosed by ultrasonography and/or direct visualization of placental location during cesarean section.

**Results:** The mean age of the population was  $28.4 \pm 6.0$  years old. Most of these delivered at term gestation (87.4%). The modes of delivery were normal vertex delivery, emergency cesarean section and elective cesarean section which presented in 60.5%, 26.5% and 12.1% of pregnancies respectively. The prevalence of placenta previa was 0.7% (6/843). The factor significantly associated with placenta previa was previous uterine curettage ( $p = 0.001$ ). The significant outcomes of pregnancy with placenta previa were maternal blood loss  $>500$  mL ( $P = 0.008$ ) and baby's APGAR score at 1<sup>st</sup> minute  $\leq 7$  ( $p = 0.006$ ).

**Conclusion:** The prevalence of pregnancy with placenta previa in Siriraj Hospital was 0.7%.

**Keywords:** Placenta previa, antepartum hemorrhage, hemorrhage in pregnancy, prevalence

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Hemorrhage in pregnancy is the most important cause of maternal death worldwide. Its contribution to maternal mortality rate is even more striking in countries with low resources.<sup>1</sup> Approximately 7% of the maternal deaths caused by obstetric hemorrhage are related to placenta previa.<sup>2</sup> This condition complicates approximately 4 in 1,000 pregnancies that are over 20 weeks of gestation.<sup>3</sup> Its prevalence in Asians has been shown to be significantly higher than other races and ethnicities.<sup>4</sup>

Placenta previa is an important cause of antepartum hemorrhage. It is also a significant contributor to postpartum hemorrhage when associated with placenta accreta. Previous cesarean delivery with associated placenta previa has been recognized as a major contributor toward emergency obstetric hysterectomy and also an ominous risk factor for life threatening bleeding following placental removal.<sup>5-6</sup> Preterm delivery as a result of placenta previa is an important cause of perinatal death. Neonatal mortality has

been reported to be three fold increased in pregnancies complicated by placenta previa.<sup>2</sup>

Placenta previa is used to describe a placenta that is implanted over or very near the internal cervical os. The known possibilities are total placenta previa, partial placenta previa, marginal placenta previa, low lying placenta previa and vasa previa.<sup>7</sup> Diagnosis by sonography is a simple, safe and accurate method. Transvaginal sonography may be used to investigate placental localization at anytime in pregnancy when the placenta is thought to be low lying. It is significantly more accurate than transabdominal sonography and its safety is well established.<sup>7</sup> After mid-pregnancy, the risk of persistence appears to be higher. Placenta previa at 15-19 weeks, 20-23 weeks, 24-27 weeks, 28-31 weeks and 32-35 weeks, persisted until delivery in 12%, 34%, 49%, 62%, 73% respectively.<sup>8</sup>

The established risk factors include advanced maternal age, multiparty, multiple gestation, previous cesarean section and smoking during pregnancy.<sup>9-12</sup> Other known risk factors are previous abortion, placenta previa in previous pregnancy, prior preterm, technologically assisted conception, working during pregnancy, cocaine use and history of retained placenta.<sup>9, 11-14</sup> Several clinical and epidemiological studies have reported disparate data on the prevalence and risk factors associated with this condition.

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The complication associated with placenta previa has a significant impact on treatment planning, budget allocation and on human resource management especially in the neonatal intensive care unit (NICU) for care of preterm and neonate newborns in tertiary referral centres. Realization of the burden of this condition, identification of the risk factors during antenatal care (ANC), effective counseling, close monitoring of those high risk mothers, prompt detection of complications, prompt optimal intervention and an adequate NICU facility are vital steps towards reduction of maternal and perinatal mortality.

The primary objective of this study was to determine the prevalence of placenta previa, and secondary objectives to describe the associating factors of placenta previa, and the outcomes of pregnancy in pregnant women who attended Siriraj Hospital. There is no previous study on the prevalence of placenta previa in Siriraj Hospital. This study therefore may help to identify areas of future research and need assessment.

## MATERIALS AND METHODS

After ethical approval from the Siriraj Institutional Review Board (Si.513/2010), a retrospective review was done for inpatient medical records of pregnant women (running case respectively) who were singleton, 28 week's gestation or more and delivered at Siriraj Hospital was conducted. The gestational age was estimated based on the mother's last menstrual period or ultrasound dating in women with uncertain or unknown date. Twin pregnancy, uncertain gestational age without ultrasound dating and incomplete medical record women were excluded from the study.

All of the pregnant women underwent ultrasonographic dating for gestational age estimation, screening sonography, serial follow up of fetal growth and some for prenatal diagnosis and other clinical indications. Hence, the placental location was usually known prior to delivery. For those who were diagnosed with or suspected to have placenta previa during the screening examination, they were followed up by ultrasound which was performed with an empty urinary bladder by transvaginal scan between 32 and 34 weeks to determine the persistence of placenta previa or to confirm the diagnosis. The diagnosis of placenta previa for this study was based on sonographic diagnosis during the third trimester at 28 weeks' gestation or more and /or subsequent intraoperative visualization of placenta previa during cesarean section. This included four types of placenta previa namely totalis, partialis, marginalis and low lying placenta previa.

The prenatal record, labor and delivery visits of all pregnant women in the sample population were reviewed to extract the maternal demographic characteristics, associated factors of placenta previa, medical and obstetric complications and outcomes in the mother and the newborn. The variables evaluated included maternal age at delivery, parity, gestational age, pre-pregnancy body mass index (BMI - calculated as weight in kilograms divided by square of height in meters), previous cesarean section, uterine curettage, cigarette smoking, illicit drug use, underlying disease, obstetric complications, gestational age at birth, blood loss, birth weight, APGAR score, gender of newborn, NICU admission and neonatal death.

Statistical analysis consisted initially of descriptive statistics for each variable which included frequency counts for categorical variables and mean with standard deviation

for continuous variables. The comparison between pregnancies with and without placenta previa was made on various variables Chi-square and Fishers exact test as appropriate. A p value of <0.05 was considered statistically significant.

## RESULTS

Eight hundred and forty three inpatient medical records between January and February 2009 were included in this study. The baseline characteristics of our study population have been shown in Table 1. Maternal age at delivery was  $28.4 \pm 6$  years old. Mean pre-pregnancy BMI was  $22.4 \pm 4.3$  kg/m<sup>2</sup>. About half (53.6%) of our study population were nulliparous. The majority (87.4%) delivered after 37 weeks' gestation. The modes of delivery were 60.5% for normal vertex delivery, 26.5% for emergency cesarean section and 12.1% for elective cesarean section. The mean baby birth weight was  $3,049.9 \pm 496.1$  grams. Placenta previa was found in 6 of total 843 pregnancies or 0.7% of prevalence. The number and type of placenta previa diagnosed were three totalis (0.4%), one marginalis (0.1%) and two low lying (0.2%). (Data not shown in table) The factors associated with placenta previa have been shown in Table 2. There were no significant difference between cases with and without placenta previa in many factors including maternal age, parity, previous cesarean section, smoking, medical and obstetric complication. Only a previous history of uterine curettage was found to be a factor associated with placenta previa (p value <0.01). Pregnancy outcomes have been presented in Table 3. Some factors were found to be significantly related with placenta previa in this study which were maternal blood loss more than 500 milliliter (mL) (p value = 0.008) and neonatal APGAR score  $\leq 7$  in 1 minute (p value = 0.006) whereas there were no differences in APGAR score  $\leq 7$  in 5 minutes, low birth weight infant, neonatal gender and NICU admission between groups.

Six pregnant women have been shown in Table 4 who had placenta previa without obstetric history and outcomes of pregnancy. For all cases delivered by cesarean section, 50% had preterm delivery, 50% had postpartum hemorrhage, 2 cases were provided blood transfusion and no case of cesarean hysterectomy. The duration of admission time was 4-7 days. The fetal outcome showed 50% had birth asphyxia, but none needed admission in intensive care unit (NICU).

**TABLE 1.** Baseline characteristics of 843 pregnant women.

Variables	Mean $\pm$ SD or N (%)
Age (yrs old)	28.4 $\pm$ 6.0
Pre-pregnancy BMI (kg/M <sup>2</sup> ) (n = 791)	22.4 $\pm$ 4.3
Parity	
0	452 (53.6)
$\geq 1$	391 (46.4)
Gestational age at birth (weeks gestation)	
<34	38 (4.5)
34 - 37	68 (8.1)
>37	737 (87.4)
Modes of delivery	
Spontaneous vertex delivery	510 (60.5)
Emergency cesarean section	223 (26.5)
Elective cesarean section	102 (12.1)
Vaginal breech assisting	2 (0.2)
Forceps or vacuum extraction	6 (0.7)
Baby birth weight (g)	3,049.9 $\pm$ 496.1

**TABLE 2.** Factors associated with placenta previa.

Variables	Placenta previa N (%)	Non placenta previa N (%)	P value
Maternal age (yrs old)			0.053
<35	3 (50.0)	707 (84.5)	
≥35	3 (50.0)	130 (15.5)	
Parity			0.424
Nullipara	2 (33.3)	450 (53.8)	
Multipara	4 (66.7)	387 (46.2)	
Previous uterine curettage			0.001
No	2 (33.3)	773 (92.4)	
Yes	4 (66.7)	64 (7.6)	
Previous cesarean section			0.513
No	5 (83.3)	743 (88.8)	
Yes	1 (16.7)	94 (11.2)	
Smoking		1.000	
No	6 (100.0)	825 (98.6)	
Yes	0 (0)	12 (1.4)	
Illicit drug used <sup>†</sup>			1.000
No	6 (100.0)	823 (98.3)	
Yes	0 (0)	14 (1.7)	
Medical complication <sup>‡</sup>			0.055
No	4 (66.7)	783 (93.5)	
Yes	2 (33.3)	54 (6.5)	
Obstetric complication <sup>§</sup>			0.413
No	2 (33.3)	473 (56.5)	
Yes	4 (66.7)	364 (43.5)	

**Note:** † = pregnant women who used amphetamine, cocaine and other illicit drugs

‡ = pregnant women who had underlying of medical disease such as; thalasemia, thyroid disorder, respiratory disease, heart disease, autoimmune disease and other diseases

§ = pregnant women who present with obstetric complication such as; gestational diabetes, pregnancy induced hypertension and other diseases

**TABLE 3.** Pregnancy outcomes of study population.

Variables	Placenta previa N (%)	Non placenta previa N (%)	P value
Gestation age at birth (weeks gestation)			0.147
<34	21 (2.5)	21 (2.5)	
≥34	5 (83.3)	816 (97.5)	
Estimated blood loss (mL)			0.008
<500	3 (50.0)	772 (92.2)	
≥500	3 (50.0)	65 (7.8)	
APGAR score at 1 <sup>st</sup> minute		0.006	
≤7	3 (50.0)	57 (6.8)	
7	3 (50.0)	779 (93.2)	
APGAR score at 5 <sup>th</sup> minute		1.000	
≤7	0 (0)	13 (1.6)	
>7	6 (100.0)	823 (98.4)	
Gender of baby		0.687	
Female	2 (33.3)	412 (49.2)	
Male	4 (66.7)	424 (41.8)	
Low birth weight <sup>†</sup>		0.125	
No	4 (66.7)	749 (89.5)	
Yes	2 (33.3)	88 (10.5)	
NICU admission		0.102	
No	5 (83.3)	821 (98.1)	
Yes	1 (16.7)	14 (1.9)	

**Note:** † = baby birth weight less than 2,500 gram, NICU = neonatal intensive care unit, mL = milliliter

**TABLE 4.** Pregnant women who had placenta previa and outcomes of pregnancy.

Case	Age (yrs old)	BMI (kg/m <sup>2</sup> )	Type of placenta previa	Number of previous C/S	Number of previous uterine curettage	GA at birth (weeks)	Mode of delivery	Blood loss (mL)	Blood transfusion	Body birth weight of fetus (gram)	APGAR score at 1 <sup>st</sup> , 5 <sup>th</sup> minute
1	32	18.2	Low lying	0	1	38	Elective C/S	400	No	3,460	9, 10
2	36	18.1	Marginalis	0	2	35	Emergency C/S	600	No	2,780	9, 10
3	25	17.3	Totalis	0	1	34	Emergency C/S	400	No	2,310	10, 10
4	34	29.1	Totalis	0	0	38	Emergency C/S	1,000	Yes	3,100	5, 10
5	36	26.2	Low lying	1	1	29	Emergency C/S	1,000	Yes	1,250	3, 8
6	39	21.8	Totalis	0	0	38	Emergency C/S	400	No	3,630	4, 9

Note: BMI = body mass index, C/S = cesarean section, GA = gestational age, mL = milliliter

## DISCUSSION

Placenta previa is one of the most common causes of antepartum hemorrhage in our daily practice. Many factors are known to be associated with this condition such as previous cesarean delivery or uterine surgery, smoking and multiparity.<sup>1,9,11-12</sup> The diagnosis of this condition is easily performed using transvaginal ultrasonography.<sup>1,7</sup> Early diagnosis and appropriate management improve both maternal and perinatal outcomes.<sup>11</sup>

The prevalence of placenta previa in the present study is similar to the result of a prevalence study in the Asian population and within the range of many of other previous studies.<sup>3-4,9,12,15-16</sup> Our study has confirmed the findings of previous studies that previous history of uterine curettage was strongly associated with placenta previa.<sup>9</sup> Surprisingly, different from previous studies, well known risk factors such as previous cesarean section, multiparity and smoking were not related with placenta previa in our study. Smoking is uncommon in Thai women. Only 12 Of 843 pregnant women had an experience of smoking in our review, therefore it was hard to discuss about this issue. Similarly, for parity, at present, Thai families limit their offspring to 2-3 children and this may affect the incidence of placenta previa. A previous study reported a 2.2% incidence in women with a parity of 5 or greater which was an increase compared with women with low parity.<sup>1</sup>

Preterm delivery as a result of placenta previa is an important cause of perinatal death.<sup>2</sup> Obstetricians should be aware and concerned because preterm delivery could cause several perinatal morbidities especially neonatal pulmonary immaturity or birth asphyxia which was found in our study. However in this study, preterm delivery before 34 weeks' and low birth weight were not associated with placenta previa. This could be due to early detection of placenta previa and most of these in our study were detected since the second trimester. Such early detection and timely awareness could have contributed towards continuation of pregnancy until term without complication. However, it is difficult to conclude the relationship among these variables as in a previous study.<sup>17</sup>

Some limitations were identified in this study. Firstly, our retrospective study might have some incomplete and inaccurate information, information for example, last menstrual period, total weight gain and history of smoking. Secondly, a relatively smaller sample size for low prevalent placenta previa might limit the ability to determine associated risk factors. Thirdly, the prevalence of pregnancy with low lying placenta may have been underestimated due to misdiagnosis. Lastly, our hospital-based study may not

represent the prevalence of placenta previa in the community.

The result of our study suggests its clinical application in daily obstetric and pediatric practice. Antepartum screening of placenta previa especially in pregnant women with history of uterine curettage, and increased awareness among obstetricians regarding early diagnosis and proper management to prevent placenta previa should be practiced. Similarly, preoperative counseling to parents, preparedness and timely intervention for postpartum hemorrhage is important.

## CONCLUSION

The prevalence of pregnancy with placenta previa in this study was 0.7%. Previous uterine curettage was significantly associated with placenta previa. Postpartum hemorrhage and birth asphyxia were strongly associated with pregnancy complicated by placenta previa.

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## REFERENCES

- Obstetrics hemorrhage. In: Cunningham FG, Leveno KJ, Bloom SL, Hauth JP, Rouse DJ, Spong Cy, editors. Williams Obstetrics. 23<sup>rd</sup> ed. New York: The McGraw-Hill Companies; 2010. p. 757-803.
- Obstetrics hemorrhage. In: Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Gilstrap III LC, Wenstrom KD, editors. Williams Obstetrics. 22<sup>nd</sup> ed. New York: The McGraw-Hill Companies; 1997. p. 809-54.
- Faiz AS, Ananth CV. Etiology and risk factors for placenta previa: an overview and meta-analysis of observational studies. *J Matern Fetal Neonatal Med.* 2003 Mar;13(3):175-90.
- Kim L, Caughey A, Esscobar G. Racial and ethnic differences in the prevalence of placenta previa. *Am J Obstet Gynecol.* 2008;199 (6 Suppl 1): S105.
- Lone F, Sultan AH, Thakar R, Beggs A. Risk factors and management patterns for emergency obstetric hysterectomy over 2 decades. *Int J Gynaecol Obstet.* 2010 Apr;109(1):12-5.
- Yaegashi N, Chiba-Sekii A, Okamura K. Emergency postpartum hysterectomy in women with placenta previa and prior cesarean section. *Int J Gynaecol Obstet.* 2000 Jan;68(1):49-52.
- Oppenheimer L. Diagnosis and management of placenta previa. *J Obstet Gynaecol Can.* 2007 Mar;29(3):261-73.
- Dashe JS, McIntire DD, Ramus RM, Santos-Ramos R, Twickler DM. Persistence of placenta previa according to gestational age at ultrasound detection. *Obstet Gynecol.* 2002 May;99(5 Pt 1):692-7.
- Hung TH, Hsieh CC, Hsu JJ, Chiu TH, Lo LM, Hsieh TT. Risk factors for placenta previa in an Asian population. *Int J Gynaecol Obstet.* 2007 Apr;97(1):26-30.

10. Butler EL, Dashe JS, Ramus RM. Association between maternal serum alpha-fetoprotein and adverse outcomes in pregnancies with placenta previa. *Obstet Gynecol.* 2001 Jan;97(1):35-8.
11. Kiondo P, Wandabwa J, Doyle P. Risk factors for placenta praevia presenting with severe vaginal bleeding in Mulago hospital, Kampala, Uganda. *Afr Health Sci.* 2008 Mar;8(1):44-9.
12. Ananth CV, Smulian JC, Vintzileos AM. The association of placenta previa with history of cesarean delivery and abortion: a metaanalysis. *Am J Obstet Gynecol.* 1997 Nov;177(5):1071-8.
13. Macones GA, Sehdev HM, Parry S, Morgan MA, Berlin JA. The association between maternal cocaine use and placenta previa. *Am J Obstet Gynecol.* 1997 Nov;177(5):1097-100.
14. Eniola AO, Bako AU, Selo-Ojeme DO. Risk factors for placenta praevia in southern Nigeria. *East Afr Med J.* 2002 Oct;79(10):535-8.
15. Nyango DD, Mutihir JT, Kigbu JH. Risk factors for placenta praevia in Jos, north central Nigeria. *Niger J Med.* 2010 Jan-Mar;19(1):46-9.
16. Crane JM, van den Hof MC, Dodds L, Armson BA, Liston R. Neonatal outcomes with placenta previa. *Obstet Gynecol.* 1999 Apr;93(4):541-4.
17. Ananth CV, Demissie K, Smulian JC, Vintzileos AM. Relationship among placenta previa, fetal growth restriction, and preterm delivery: a population-based study. *Obstet Gynecol.* 2001 Aug;98(2):299-306.