The Egyptian Journal of Hospital Medicine (January 2021) Vol. 82 (4), Page 675-681

Study of Maternal and Fetal Outcome of Placenta Previa in Zagazig University Maternity Hospital

Yousef Abo Elwaan, Mohamed Sabry Mohamed, Ismail Sabry Ismail*, Wael Sabry Nosir
Department of Obstetrics and Gynecology, Faculty of Medicine, Zagazig University, Egypt.
Correspondence to: Ismail Sabry Ismail, **Mobile:** (+20)01124023200, **E-mail:** sabryismail199@gmail.com

Abstract

Background: Placenta previa accounts for approximately 0.5% of all deliveries but remains major cause of perinatal mortality and morbidity.

Objective: This study aimed to evaluate the outcome (both maternal and fetal) of placenta previa in Zagazig University Maternity Hospital.

Patients and Methods: A cross sectional study that was conducted on 160 pregnancies with placenta previa in Obstetric and Gynecology Department of Zagazig University Hospitals from October 2018 until October 2019.
The diagnosis of placenta previa was based on ultrasonography and confirmed at cesarean delivery.

Results: 160 cases of placenta previa were studied regarding the perinatal and maternal outcome. The maternal ages were high and ranged from 31.9 to 36 years old. Incidence of placenta previa was highest in 60.7% of the multiparous group. Perinatal morbidity was studied as the percentage of babies requiring resuscitation and NICU admission, which was 21.3% of the cases. The percentage of perinatal deaths was 7.5%.

Conclusions: The reduced maternal mortality in recent years is mainly due to presence of qualified team of placenta previa and accreta, better diagnosis, blood transfusion, effective antibiotic therapy and better understanding of the management of shock and renal failure.

Keywords: Placenta previa, Maternal morbidity, Neonatal mortality.

INTRODUCTION

Placenta previa is a major cause of maternal morbidity and mortality because of the associated antepartum and intrapartum hemorrhage. Moreover, placenta previa is associated with preterm delivery, with the neonatal mortality increasing three fold as a result of prematurity. The prevalence of placenta previa has been recently estimated to be approximately 0.5% of all pregnancies, and this increase correlates to the elevated cesarean section rate [1, 2].

Placenta previa should be suspected in any woman beyond 20 weeks of gestation who presents with painless vaginal bleeding. For women who have not had a second trimester ultrasound examination, antepartum bleeding after 20 weeks of gestation should prompt sonographic determination of placental location before digital vaginal examination is performed because palpation of the placenta can cause severe hemorrhage [3].

This situation prevents a safe vaginal delivery and requires the delivery of the neonate to be via cesarean delivery. Most cases are diagnosed early in pregnancy via sonography and others may present to the emergency room with painless vaginal bleeding in the second or third trimester of pregnancy. The presence of placenta previa can also increase a woman's risk for placenta accreta spectrum (PAS) [4].

The underlying cause of placenta previa is unknown. There is, however, an association between endometrial damage and uterine scarring [5]. The risk factors that correlate with placenta previa are advanced maternal age, multiparity, smoking, cocaine use, prior suction, curettage, assisted reproductive technology, history of cesarean section(s), and prior placenta previa [6, 5, 7].

Uncontrolled postpartum hemorrhage from placenta previa or PAS may necessitate a blood transfusion, hysterectomy and leaving the patient infertile, admission to the ICU, or even death [5]. Tranexamic acid (TXA), an antifibrinolytic agent, could exert its hemostatic effect via inhibiting the activation of plasminogen to plasmin. Its efficacy and safety in reducing hemorrhage and lowering transfusion requirements have been well established in various elective surgeries [8].

During delivery, when the placenta separates from the uterine wall, physiologic and hemostatic changes occur sequentially to reduce bleeding as strong myometrial contractions, increased platelet activity, massive release of coagulation factors and consequently a parallel increase in fibrinolytic activity.

While oxytocin administration enhances the first mechanism, TXA administration might be able to counteract the latter and thus facilitate the hemostatic process. Finally, the association between the extent of the initial decrease in plasma fibrinogen and the subsequent severity of blood loss reported in women with early postpartum hemorrhage (PPH) suggests that both the coagulation and fibrinolysis processes are implicated in the control of postpartum blood loss. This further supports the hypothesis that TXA might be effective in PPH prevention. Accordingly, there is a clear theoretical rationale for the use of antifibrinolytic agents to reduce postpartum blood loss [9]. This study aimed to evaluate the outcome (both maternal and fetal) of placenta previa in Zagazig University Maternity Hospital.

Received:21 /7 /2020
Accepted:23 /8/2020

PATIENTS AND METHODS

This cross sectional study included 160 pregnancies with placenta previa admitted to Obstetric & Gynecology Department at Zagazig University Hospitals through the period from October 2018 until October 2019. They were calculated by open Epi.

Inclusion criteria: Age < 40 years old. Diagnosed to have placenta previa by U/S. Patients with and without maternal or fetal complications. Patients with gestational age > 28 week.

Exclusion criteria: Patients with severe cardiac or pulmonary diseases. Patients with uncontrolled DM. Patients with liver disease. Patient with history of coagulation disorders.

All patients were subjected to full history, clinical examination and laboratory studies including complete blood count (CBC), ABO and Rh compatibility, prothrombin time (PT) and partial thromboplastin time (PTT). The sonographic diagnosis of placenta previa requires the identification of echogenic homogeneous placental tissue covering or proximate to the internal cervical os (a distance greater than 2 cm from the os excludes the diagnosis of previa). Calculation of gestational age was determined by the last menstrual periods and first-trimester ultrasound.

Primary Measures: Neonatal Apgar score, neonatal admission to NICU or not and neonatal weight.

Secondary measures: Gestational age at which C.S was done. Type of C.S (Emergency or Elective and USCS or LSCS). Amount of blood loss. Amount of blood transfusion. CBC postoperative. Complication whether intra- or postoperative (fever, DIC, VTE, maternal infection, ICU admission and caesarian hysterectomy). Time of discharge from hospital.

Ethical and patients' approval: The study protocol was approved by the Ethics Committee of Faculty of Medicine, Zagazig University. An informed consent was taken from each participant before taking any data or doing any investigations. Approval of IRB.4468

Statistical Analysis

Data were verified, coded by the researcher and analyzed using IBM-SPSS Statistics for windows, version 23.0 (Copyright IBM Corp., Armonk, N.Y., USA. 2015). Descriptive statistics: Means, standard deviations, medians, ranges and percentages were calculated. Test of significances: chi-square test was used to compare the difference in distribution of frequencies among different groups. For continuous variables; independent t-test analysis was carried out to compare the means of dichotomous data. There was no specific calculation of the sample size. A significant p-value was considered when it is equal or less than 0.05.

RESULTS

Table (1): Demographic data distribution among studied group (N=160)

Maternal age	**Mean ± SD**	**31.9 ± 4.71**	
	Median (Range)	**32.0 (23-41)**	
GA by LMP	**Mean ± SD**	**36.16 ± 2.16**	
	Median (Range)	**36.0 (28-38)**	
		N	**%**
HiGravidity	**≤ 2**	**17**	**10.6**
	3-5	**114**	**71.2**
	>5	**29**	**18.1**
Parity	**0**	**9**	**5.6**
	≤ 2	**97**	**60.7**
	>2	**54**	**33.8**
Previous Abortion	**No**	**74**	**46.8**
	Yes	**86**	**53.8**
	Total	**160**	**100.0**

Mean maternal age was distributed as **31.9 ± 4.71** and GA was **36.16 ± 2.16**, majority were gravidity 3-5 and parity **≤ 2** and 53.8% had experienced previous abortion (table 1).

Table (2): Obstetric history distribution among studied group

		N	%
Antepartum Bleeding	**No**	**25**	**15.6**
	Yes	**135**	**84.4**
Previous deliveries	**CS**	**122**	**76.3**
	Vaginal	**7**	**4.4**
	Mixed	**31**	**19.4**
CS	**Once**	**75**	**61.4**
	More	**47**	**38.6**
DM	**No**	**131**	**81.9**
	Yes	**29**	**18.1**
Preeclampsia	**No**	**152**	**95.0**
	Yes	**8**	**5.0**
	Total	**160**	**100.0**

84.4% had antepartum hemorrhage, previous delivery were 76.3% CS and less than 5.0% had relevant family history or medical history (table 2).

Table (3): Ultrasonography finding and result distribution among studied group

GA by US	**Mean ± SD**	**34.55 ± 3.48**	
	Median (Range)	**35.0 (23-38)**	
		N	**%**
Placenta previa	**Low lying**	**41**	**25.6**
	Complete central	**83**	**51.9**
	Morbidly accreta spectrum	**36**	**22.5**
Cervical internal OS	**Incomplete**	**55**	**34.4**
	Complete Covered	**105**	**65.6**
	Total	**160**	**100.0**

Majority were placenta previa central 51.9% and 65.6% had complete covered internal cervical OS and possibility of accreta founded in 43.8% (table 3).

Table (4): Maternal outcome and complications

Hospital stay	Mean± SD	6.78±2.5	
	Median (Range)	7.0 (1-14)	
		N	%
Hysterectomy		41	25.6
Maternal death		1	0.6
Infection		12	7.5
ICU admission		32	20.0
Pulmonary embolism		3	1.9
Blood transfusion		114	71.2
Post-partum hemorrhage		49	30.6
Uterine artery ligation		42	26.2
Internal iliac artery ligation		2	1.2
Shock		21	13.1
Bladder injury		2	1.24
Ureter injury		1	0.62
Bowel injury		1	0.62
Total		160	100.0

Major complication were blood transfusion 71.2% and postpartum hemorrhage with 30.6%. Maternal death occurred in one case, which came to emergency in severe shock (table 4).

Table (5): Neonatal outcome and complications

Birth weight (gram)	Mean ± SD	2890.3 ± 493.1	
	Median (Range)	3000.0 (1500-3500)	
		N	Percent
Sex	Male	120	75.0
	Female	40	25.0
Apgar	Bad	19	11.9
	Good	141	88.1
NICU	Not	116	72.5
	Needed	44	27.5
Still birth		5	3.1
Neonatal mortality		12	7.5
Neonatal morbidity		34	21.3
Total		160	100.0

Majority were males with BW 2890.3 ± 493.1 gm. 27.5% needed NICU, 5 cases had still birth and 12 cases mortality and 21.3% had morbidity (table 5).

Table (6): Outcome and complications in relation to different types of placenta previa

			Placenta previa			Total	X^2	P
			Low laying	Complete central	Accrete spectrum			
Hystrectomy	Not	N	41	51	27	119		
		%	100.0%	61.4%	75.0%	74.4%		
	Done	N	0	32	9	41	21.44	0.001**
		%	0.0%	38.6%	25.0%	25.6%		
Death	Survived	N	41	80	36	159		
		%	100.0%	89.8	100.0%	99.4%		
	Died	N	0	1	0	1	1.1	0.57
		%	0.0%	1.2%	0.0%	0.6%		
Infection	-VE	N	32	80	36	148		
		%	78.0%	96.4%	100.0%	92.5%		
	+VE	N	9	3	0	12	17.6	0.00**
		%	22.0%	3.6%	0.0%	7.5%		
ICU	Not	N	38	61	29	128		
		%	92.7%	73.5%	80.6%	80.0%		
	Needed	N	3	22	7	32	6.33	0.04*
		%	7.3%	26.5%	19.4%	20.0%		
Pulmonary embolism	-VE	N	41	80	36	157		
		%	100.0%	96.4%	100.0%	98.1%		
	+VE	N	0	3	0	3	2.87	0.24
		%	0.0%	3.6%	0.0%	1.9%		
Blood Transfusion	Not	N	15	20	11	46		
		%	36.6%	24.1%	30.6%	28.8%		
	Needed	N	26	63	25	114	0.91	0.63
		%	63.4%	75.9%	69.4%	71.2%		
Post-partum hemorrhage	-VE	N	35	52	24	111		
		%	85.4%	62.7%	66.7%	69.4%		
	+VE	N	6	31	12	49	6.87	0.03*
		%	14.6%	37.3%	33.3%	30.6%		
Uterine artery ligation	Not	N	8	9	5	22		
		%	19.5%	10.8%	13.9%	13.8%	1.74	0.41
	Done	N	33	74	31	138		
		%	80.5%	89.2%	86.1%	86.2%		
INT iliac ART ligation	Not	N	23	40	18	81		
		%	56.1%	48.2%	50.0%	50.6%		
	Done	N	18	43	18	79	0.69	0.76
		%	43.9%	51.8%	50.0%	49.4%		
Shock	-VE	N	41	67	31	139		
		%	100.0%	80.7%	86.2%	86.9%		
	+VE	N	0	16	5	21	8.47	0.014*
		%	0.0%	19.3%	13.8%	13.1%		
Bladder injury	-VE	N	39	83	36	158		
		%	95.2%	100.0%	91.7%	98.8%		
	+VE	N	2	0	0	2	0.67	0.48
		%	4.8%	0.0%	8.3%	1.2%		
Ureter injury	-VE	N	41	77	36	159		
		%	100.0%	98.8%	100.0%	99.38%	0.38	0.87
	+VE	N	0	1	0	1		
		%	0.0%	1.2%	0.0%	0.62%		
Bowel injury	-VE	N	41	81	36	159		
		%	100.0%	98.8%	100.0%	99.38%	0.38	0.87
	+VE	N	0	1	0	1		
		%	0.0%	1.2%	0.0%	0.62%		
Total		N	41	83	36	160		
		%	100.0%	100.0%	100.0%	100.0%		

Hysterectomy, ICU, Shock and postpartum hemorrhage significantly associated with central type and then marginal but infection significantly associated with anterior type (table 6).

Table (7): Neonatal Outcome and complications in relation to different of placenta previa

			Placenta previa			Total	X^2	P
			Anterior	Central	Marginale			
Apgar	**Bad**	**N**	3	13	3	19		
		%	7.3%	15.7%	8.3%	11.8%		
	Good	**N**	38	70	33	141	10.88	0.02*
		%	92.7%	84.3%	91.7%	88.1%		
NICU	**Not**	**N**	35	55	26	116		
		%	85.4%	66.3%	72.2%	72.5%		
	Needed	**N**	6	28	10	44	5.11	0.02*
		%	14.6%	33.7%	27.8%	27.5%		
Still birth	**-VE**	**N**	41	78	36	155		
		%	100.0%	94.0%	100.0%	96.9%		
	+VE	**N**	0	5	0	5	4.78	0.09
		%	0.0%	6.0%	0.0%	3.1%		
Neonatal mortality	**-VE**	**N**	38	77	33	148		
		%	92.7%	92.8%	91.7%	92.5%		
	+VE	**N**	3	6	3	12	0.04	0.97
		%	7.3%	7.2%	8.3%	7.5%		
Neonatal morbidity	**-VE**	**N**	35	65	26	126		
		%	85.4%	78.3%	72.2%	78.8%		
	+VE	**N**	6	18	10	34	1.96	0.36
		%	14.6%	21.7%	27.8%	21.2%		
Total		**N**	41	83	36	160		
		%	100.0%	100.0%	100.0%	100.0%		

No significant difference or association except that bad APGAR significantly associated with central and NICU with central and marginal types (table 7).

DISCUSSION

Main gestational age of termination was 36 weaks as there many protocols and guidelines prefer to terminate. The risk of haemorrhage increases with increasing gestational age from 4.7% at 35 weeks to as high as 59% at 38 weeks. The mean fetal gestational age was 37.3 ± 1.04 weeks (range, 35-39 weeks), and this degree of fetal maturity may explain our high rate of hysterectomy and blood transfusion.

The mean maternal age in this study was 32 years, which may be due to our traditions in late marriage and small sample of this study. **In Prasanth *et al.*** [10] study, placenta previa was highest in the age group of 20-29 years (72.9%) followed in descending order by women in the 30-35 years age group, above 35 years age group and less than 19 year age group (20.3%, 5.1% and 1.7% respectively). In the study about placenta praevia in Najran University hospital The majority (65.2%) of the patients with placenta praevia were in the age group 20-29 years. In contradistinction to the findings of **Silver *et al.*** [4] who found that women of 30 years of age or older, were more than twice as likely to have pregnancies complicated by placenta praevia. The incidence of placenta previa in **Prasanth *et al.*** [10] study was highest in the age group of 20-29 years.

In the present study, the incidence of placenta previa was highest (60.7%) in multigravidas (with two to one viable births). The incidence in grand multi (> 2viable births) was 33.8% and in Primi it was 5.6%. In **Prasanth *et al.*** [10] study the incidence of placenta previa was highest (73.55%) in multi gravidas (with two to three viable births). The incidence in grand multi (> 4 viable births) was 6.32% and in Primi it was 26.43%.

In the present study, perinatal morbidity was studied as the percentage of babies requiring resuscitation and NICU admission was 27.5% of the cases. **Neonatal mortality** 12 cases (7.5%) and 21.3% had morbidity. In **Prasanth *et al.*** [10] study, 1.6% and 44.3% of babies received resuscitation and NICU admission (respectively), while 39.34% of babies recovered.

In the present study, major complications were uterine artery ligation (86.3%) and blood transfusion with (69.4%). Some studies showed that 90% of patients with placenta accreta required blood transfusion and packed red blood cells is needed in 40% of cases. Shock/hypotension was noticed in 13.1% of cases, PPH was noticed in 30.6% of cases and 41 cases of placenta previa required caesarean hysterectomy to control the bleeding in the immediate post-operative period [11, 12, 13].

Mothers who have undergone hysterectomy had placenta accreta and none had placenta previa. The average units of donated blood were 2.5 ± 1.8 units with a maximum of 8 units in some cases. This indicates that liberal blood transfusion and cesarean hysterectomy are important factors in reducing case-fatality rate in women with placenta accreta. Some studies showed that 90% of patients with placenta accreta required blood transfusion and packed red blood cells is needed in 40% of cases [14, 15].

In the **Prasanth *et al.* [10]** study , 39.65% (n = 69) patients received blood transfusions and 3.7% of patients went in for hypotension and / or shock. No patients had febrile morbidity in the post-operative period. The incidence of PPH was 27.9%, hysterectomy was done in 4 cases (7.46%). In this study, 3 case of peripartum hysterectomy was for anterior placenta previa. Adherent placenta was seen in 6 cases (3.44%). The indication for emergency peripartum hysterectomy in recent years has changed from traditional uterine atony to abnormal placentation.

Patients with placenta previa and scarred uterus had 16% risk of undergoing emergency peripartum hysterectomy compared to 3.6% in patient with unscarred uterus. In the present study, 2 cases, caesarean hysterectomy was done for uterine atony, after all conservative measure to arrest bleeding failed.

In this study hystrectomy, ICU, Shock and post partum hemorrhage significantly were associated with central type then marginal but infection and bladder injury were significantly associated with anterior type. **Jang *et al.* [16]** performed a study looking at different localizations and found that anterior position increases the incidence of excessive blood loss, massive transfusion, placental accreta and hysterectomy.

CONCLUSION

Placenta previa is a potential life threatening condition to both mother and baby. Thorough antenatal care and planned delivery in well-equipped centre may improve outcome in future. The reduced maternal mortality in recent years is mainly due to presence of qualified team of placenta previa and accreta, better diagnosis, blood transfusion, effective antibiotic therapy and better understanding of the management of shock and renal failure. Further researches on larger populations are needed to study the risk assessment and long term consequences of cesarean sections.

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