

Evaluation of Obstetric Anaesthesia and its Association with Maternal Outcomes in Women with Placenta Previa: A Cross-Sectional Study

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ABSTRACT

Objective: To determine the frequency of mode of anaesthesia (MOA). The secondary outcome was to determine an association between MOA, type 4 PP, previous CS and maternal outcomes.

Study Design: A retrospective cross-sectional study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology (OBGYN), MTI Lady Reading Hospital Peshawar from January 2020 - December 2022.

Methods: It included women with singleton pregnancy with PP, after 28 weeks of gestation. Women with other causes of antepartum haemorrhage, previous myomectomy and medical disorders complicating pregnancy were excluded. Maternal outcomes included per-operative blood loss (POBL), per-operative RBC transfusion (POBT) and transfer to the critical care unit (TCCU) as mentioned in operative notes. Data was collected and analyzed by SPSS version 22.

Results: A total of 170 women were included in two years. MOA included General anaesthesia (GA) in 96 (56.5%) and Spinal anaesthesia (SA) in 74 (43.5%) cases. GA was frequently given in Emergency CS (EMCS), elective CS (ELCS) and type 4 PP. POBL of less than 1500ml dominated, POBT of less than or equal to 4 pints was found to be 143 (84.1%) while a large number of patients were managed in obstetrical wards 150 (88.2%) compared to HDU and ICU with a non-significant association.

Conclusion: GA was frequently adopted in our setup compared to SA, especially with the increasing severity of PP type and previous CS. Both GA and SA were safe with non-significant association with blood loss, RBC transfusion and critical care management.

Key Words: Placenta Previa, Mode of anaesthesia, per operative blood loss, Per operative blood transfusion, Critical care transfer

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INTRODUCTION

Placenta previa is an abnormal location of the placenta in the lower uterine segment, which is associated with grave maternal morbidity in terms of antepartum and per-operative haemorrhage, if not managed timely¹. Placenta previa is often graded into minor and major based on the distance of the lower edge of the placenta from internal os, types 1 and 2 comprising minor categories while types 3 and 4 constitute major placenta previa².

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The rising incidence of placenta previa and morbidly adherent placenta worldwide is attributed to escalated cesarean section rates, while previous curettage, manual removal of placenta, uterine surgery and assisted reproductive techniques are also thought to be the cause of placenta previa³. Women with placenta previa may present with painless genital tract bleeding, malpresentation, high presenting part or at times be asymptomatic, diagnosed incidentally on routine clinical examination or ultrasound⁴⁻⁶. Unpredictable antepartum haemorrhage in these women often leads to prolonged antenatal admissions in obstetrical wards, to avoid heavy bleeding episodes and related complications, that could be catastrophic to the mother's life, necessitating urgent delivery⁷. This mostly pertains to population who have long distances to travel to a health facility with needed facilities for PP. The mode of delivery is mainly cesarean section however vaginal delivery may occur in case of minor placenta previa⁸. Placenta previa due to its unforeseeable haemorrhage often ends in early delivery, adding neonatal sequelae related to prematurity in

addition to morbidity associated with PP⁹. CS and MOA, have always been under scrutiny, especially when it comes to PP. General anaesthesia was thought to be safer and quicker for women with placenta previa due to anticipated blood loss and chance of conversion of surgical procedure to hysterectomy with possible need of intensive care unit transfer¹⁰. But now advances in regional anaesthesia, have implicated its use to be equally safer for placenta previa¹¹. Several studies can be searched related to the mode of anaesthesia among patients with placenta previa. However, few can be found locally to understand the importance of anaesthesia and hemodynamic stability of these patients. We designed this study to evaluate the mode of anaesthesia in tertiary care that can help establish its safety and practice in obstetrics, thus devising evidence-based local protocols and guidelines for women with PP.

METHODS

This retrospective cross-sectional study was conducted in the department of obstetrics and gynaecology in a tertiary care hospital, MTI Lady Reading Hospital Peshawar between January 2020 to December 2022, after obtaining ethical approval from the hospital Institutional Review Board. This study included all the women with singleton pregnancies diagnosed with PP, clinically or by ultrasound during the antenatal period or CS after 28 weeks of gestation, irrespective of their previous CS status. Women with the local cause of genital tract bleeding, heavy show in labor, placental abruption, morbidly adherent placenta, pregnancy with anaemia, hypertensive disorders, diabetes with polyhydramnios, other medical disorders, and previous gynecological surgery(myomectomy etc.) on the uterus that could add into maternal outcomes were excluded. Retrospective analysis of hospital software and available history charts would determine these confounding factors. The operative notes determined the MOA and maternal outcomes to be studied. Maternal outcomes included per-operative blood loss(POBL), per-operative RBC transfusion(POBT) and transfer to critical care unit(TCCU). POBL was calculated by several abdominal gauze packs used during the operation and their conversion into millilitres as per hospital protocol. POBT was determined as per the number of bags mentioned in the charts. TCCU was divided into departmental OBGYN high dependency unit(HDU) and hospital intensive care unit(ICU) which was also mentioned in operation notes. Data was collected on a specialized proforma designed for the study from the clinical records of patients, maintaining confidentiality. Data was then transferred and analyzed on SPSS version 22. Frequencies and percentages were calculated for categorical variables like PP and its types, previous CS, and maternal outcomes. Mean and standard deviation were calculated for numerical

variables like maternal age etc. Chi-square test/Fisher's Exact test was applied to determine the association between mode of anaesthesia and previous CS, type of PP and maternal outcomes, with a p-value ≤ 0.05 was considered significant.

RESULTS

A two-year study included 191 patients with placenta previa. Women with morbidly adherent placenta were 21(10.9%) that were excluded from the study. Further analysis was done with a total of 170 patients with placenta previa. The mean age of participants was found to be 30 ±15 years. Primi gravida(first time pregnant) were 19(11.2%) , multigravida(pregnant 2-5times) were 110(64.7%) , grand multigravida (pregnant 6-8 times) were 30(17.6%) ,and great grand multigravida(pregnant >8times) were found to be 11(6.5%).Mean antenatal and postnatal stay was found to be 10 days± 14 days and 03±0.3 days, respectively, Table 01.Anterior PP was found in 61 (35.9%), posterior PP was found in 59(34.7%) while 50(29.4%)had major placenta previa covering internal OS.

Table No. 1: Demographic features of women with Placenta Previa

Maternal age	Years (mean)	SD
	30.36	±15.5
Stay obstetrical unit	Days	SD
Antenatal	10.0353	±14.28323
Postnatal	3.0824	±0.39857
Gravida status	Frequency(N)	Percentage (%)
primi gravida	19	11.2
2- 5 multi gravida	110	64.7
6-8	30	17.6
more than 8	11	6.5
Total	170	100

Table No. 2: Frequency of type of placenta previa and previous cesarean section among women with placenta previa

Type of placenta previa	Frequency(N)	Percentage (%)
1	02	1.2
2	20	11.8
3	48	28.2
4	100	58.8
Total	170	100.0

Previous cesarean section	Frequency(N)	Percentage (%)
none	148	87.1
1	16	9.4
2	04	2.4
3	01	0.6
4	01	0.6
Total	170	100

Among these 100 (58.8%) were type 4 PP followed by type 3,2 and 1 with frequency of 48(28.2%),20(11.8%), and 02(1.2%) respectively. About 61 (35.9%) had anterior placenta previa,59(34.7%) had posterior placenta previa and 50(29.4%)had major placenta previa covering internal os. About 148(87.1%) had no previous CS. Frequency of previous 1,2 CS was found to be 16(9.4%), 04(2.4%) and 01(0.6%) each for previous 3 and 4 CS, respectively, Table 02.

About 36(21.2%) women had a gestational age less than 34 weeks, 47(27.6%) had a gestational age between 34 and 37 weeks and 87(51.2%) had term gestation at the time of delivery. Emergency CS were 116(68.25%) and elective CS were 54 (31.7%) in number. MOA included GA in 96(56.5%) and SA in 74(43.5%) cases. During EMCS, GA was given in 71(74.05%)while 45(60.8%) had SA. Among elective CS, 29(39.2%) patients had SA while 24(25.0%) had GA, with a non-significant association p-value of 0.104. GA was more frequently given 64(66.7%) in patients with type 4PP than spinal anaesthesia 36(48.6%) bearing a significant association with a p-value of 0.038, however, a non-significant association of MOA with previous CS was determined with a p-value of 0.70, table 3.

Table No. 3: Frequency of type of placenta previa and previous cesarean section among women with Anaesthesia

Placenta previa type	Anaesthesia		p-value
	General	Spinal	
	Frequency %age	Frequency % age	
Type 1	01(50)	01(50)	0.038
Type 2	06(30.0)	14(70.0)	
Type 3	25(52.1)	23(47.9)	
Type 4	64(64.0)	36(36.0)	
Total	96(56.5)	74(43.5)	
Previous cesarian section			
None	82(55.4)	66(44.6)	0.70
Previous 1CS	09(56.3)	07(43.8)	
Previous 2CS	03(75.0)	01(25.0)	
Previous 3CS	01(100.0)	00(0.0)	
Previous 4CS	01(100.0)	00(0.0)	
Total	96(56.5)	74(43.5)	

Among the maternal outcomes POBL less than 1500ml dominated i.e 161(94.7%) while more than or equal to

1500 were 09(5.3%). POBT of less than or equal to 4 pints was found to be 143(84.1%) while more than 4 RBC units were transfused in 15(8.8%). A large number of patients were managed in obstetrical wards 150(88.2%), HDU care within the obstetric department was found to be 13(7.6%) and 07(4.1%) of women were managed in ICU. A non-significant association was seen for a mode of anaesthesia and blood loss, RBC transfusion, and critical care management, with Fischer exact test p-value of 0.30 for POBL, chi-square test p-value for POBT to be 0.139 and chi-square test p-value for TCCU to be 0.980.

DISCUSSION

Our study population was,170 women with PP, after excluding women with morbidly adherent placenta in 2 years. This suggest a large number of these patients in our set-up as compared to 276 patients found by, Ismail S in their study in 14 years. This may be attributed to different study designs and hospital settings, the former being a public sector hospital¹². PP was most frequently seen in multigravida 110(64.7%) in our study. A similar finding of PP dominance among multigravida 67(58.77%) was encountered in another regional retrospective study by Majeed T et al. However, a comparative more increase in multigravida in our study may be explained by the study duration and contraceptive practices of our country¹³. The most prevalent PP type was 4 in our study same to the findings of Grönvall M et al, who determined 129 cases of major PP. However, theses cases were found in a four year study while we determined major PP in two years. This contrast may be explained by different study design¹⁴. The anterior location of PP dominated our study with a frequency of 35.9%, opposite to the findings of an Iranian study which determined the anterior location of PP in 44.9% of their study population. The inclusion and exclusion criteria of both studies were different as our study included all the patients with PP but the referenced study included PP in patients with previous scar¹⁵.Oğlak SC et al in their study determined more planned CS 53.4% vs emergency CS 46.6%¹⁶. On the contrary, our emergency CS was higher than elective CS. The high emergency CS in our study may be due to the non-booked nature, and less or no antenatal visits of our population. Women with PP in our review suggested a percentage of 21.2% for very preterm and 27.6% for preterm deliveries. A Japanese study showed an overall frequency of premature delivery by 45.1%, in association with complete PP, quite similar to our findings¹⁷. However, we did not conduct the sub-analysis of gestational age with the type of PP like the Japanese study. The frequency of general anaesthesia (56.5%) was slightly higher in our study both for emergency and elective CS. A significant association of GA was determined with type 4 PP. Fan D et al also determined GA(63.76%)a frequent

finding, however, their percentage was quite high compared to us⁹. Further, it was emphasized that GA was seen more in emergency CS (26% vs. 38.6%, $P = .033$) by Fan D. On the contrary two different retrospective studies found neuraxial anaesthesia quiet safe in even complicated cases like morbidly adherent placenta. They determined the conversion rate of neuraxial anaesthesia to GA increased with increase severity of placenta^{18,19}. It can be inferred that hemodynamic stability may be the reason for the consideration of regional anaesthesia in the referenced studies. A study by Alsammani Jr determined a high number of ICU admissions 48.27% in their study which is opposite to our findings²⁰. We could not discover any significant association between the MOA and POBL, POBT and TCCU, probably because PP in itself, primarily determine these outcomes. The choice of MOA usually depends upon the patient's condition, her vitals and stability. Anaesthesia may secondarily affect the fluid balance and further management of the patient. Lieu X et al suggested that although, regional anaesthesia had lesser operative time, less blood loss and lesser RBC transfusion, nevertheless, with increasing severity of placenta previa, the conversion rate to GA was also increased which was safe²¹. A multi centre study by Orbach-zinger potentiated the results of our study by determining the increases association of GA with complete PP²². A good sample size may potentiate our findings, but input from the anaesthesia department would have elaborated the findings in a better way. A combined obstetric and anaesthesia department prospective study comparing the MOA in PP may enhance the safety analysis of GA or RA, and address these limitations of our study.

CONCLUSION

General anesthesia was frequently adopted in our setup compared to regional anaesthesia. General anaesthesia was significantly associated with type 4 placenta previa. Both General and Spinal anaesthesia were safe with no significant association with blood loss, RBC transfusion and critical care management.

Author's Contribution:

Concept & Design of Study: Shandana Bawar
 Drafting: Qudsia Qazi, Syeda Sitwat Fatima
 Data Analysis: Syeda Sitwat Fatima
 Revisiting Critically: Shandana Bawar, Qudsia Qazi
 Final Approval of version: Shandana Bawar

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