Original Article

Anaesthetic Practices and Maternal Outcome in Rising Placenta Accreta Spectrum in Tertiary Care Hospital

Sumbal Rana[1], Ali Arslan Munir[2], Qudsia Anjum Quraishi[3], Amim Muhammad Akhtar[4], Erum Pervaiz[5], Humna Syed[6]

[1] Assistant Professor, Department of Anaesthesia, Combined Military Hospital, Gilgit.

[2] Classified Anaesthetist, Department of Anaesthesia, Combined Military Hospital, Gilgit.

[3] Assistant Professor, Department of Anaesthesia, Rawalpindi Institute of Cardiology, Rawalpindi.

[4] Classified Anaesthetist, Department of Anaesthesia,, UNAMID, Sudan.

[5] Assistant Professor, Department of Obs. & Gyne., Combined Military Hospital, Quetta.

[6] Resident Gynecologist, Department of Obs. & Gyne., Pak Emirates Military Hospital, Rawalpindi.

Author`s Contribution

[1,2] *Conception of study*
[1] *Experimentation/Study conduction*
[3] *Analysis/Interpretation/Discussion Manuscript Writing*
[5] *Critical Review*
[6] *Facilitation and Material analysis*

Corresponding Author

Dr. Sumbal Rana
Assistant Professor,
Department of Anaesthesia,
Combined Military Hospital,
Gilgit
Email: surgeon001733@yahoo.com

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Abstract

Objective: This study was carried out to determine whether the rate of abnormal placentation is increasing in concurrence with the cesarean section and to assess risk factors and outcomes with multidisciplinary team interventions and anesthetic practices.

Study design: Prospective cohort study.

Material & Methods: A study was conducted in the department of anaesthesia from January 2014 to December 2017. All candidates under the spectrum of placenta accreta were observed for maternal age, parity, mode of anesthesia, blood loss, and outcome.

Results: Out of 109 patients, the preoperative diagnosis of PAS was made up of 100 (91.74%) and intraoperative diagnosis of 9 (08. 26%) patients. According to the mode of anesthesia, 100 (91.74%) patients received GA, and 09 (08.26%) patients received spinal anesthesia. In 06 (05.49%) patients, spinal was converted to GA. Perioperative CPR was done in 05 (04.58%) cases. Out of 109 cases, 83 survived uneventfully, and 21 developed complications. 05 patients expired in the following days. (01 immediately postoperative period, 02 in 1st 24 hours and 02 in 1st 48 hours.

Conclusion The rate of placenta accreta increased in conjunction with cesarean deliveries; the most important risk factors were previous cesarean delivery, placenta previa, and advanced maternal age and outcomes improved in a multidisciplinary team intervention.

Keywords: Blood transfusion, Damage control resuscitation, Hemorrhage, Placenta accreta spectrum (PAS).

Introduction

Placenta accreta spectrum is a life-threatening disease comprising of three entities on a histopathological basis i.e. placenta accreta, increta, and percreta. Placenta accreta is an abnormally firm attachment of placental villi to the uterine wall, partial or complete, owing to faulty or absent decidua basalis. This may cause catastrophic peri-partum hemorrhage leading to significant morbidity and mortality and remains the leading cause of peri-partum hysterectomy and massive PPH[1,2]. Since the early 1900s, the rate of caesarian deliveries is increasing worldwide and hence the rate of PAS[3]. In the past 50 years, the incidence reported has increased 10 fold and is now seen in 1 in 2500 pregnancies.[4]

The main risk factors for developing PAS are prior to caesarian delivery, placenta previa, and advanced maternal age.[1] There are small risk factors like myomectomy, vigorous curettages, submucosal leiomyomas[2], thermal ablation, and uterine artery embolization.

PAS is an obstetric emergency that needs a multidisciplinary approach and planned hemodynamic resuscitation strategies.[2] Effective team communication is the key to management and following damage control resuscitation protocol for blood transfusion may decrease morbidity. Pathogenesis involves increased uterine blood flow (100 to 350 ml/min in normal pregnancy and even more in PAS[2]) with poor vasospasm on account of the thin vascular wall makes the bleeding difficult to control.[6] There may be defective decidua or excessive trophoblastic invasion or both.[7] Blood loss is catastrophic in PAS. For diagnosis, a strong antenatal suspicion can be there based on clinical features, USG, Doppler, and MRA but definitive diagnosis is made only during surgery.

The estimated incidence of PAS is globally 3 in 1000 but so far no consolidated data for Pakistan is available. Since very high mortality is observed in clinical practices so multidisciplinary team efforts are used in this study.

Materials and Methodology

A prospective cohort study was conducted in the Department of Anaesthesia, Holy Family Hospital, Rawalpindi from January 2014 to December 2017 after approval from the hospital ethical committee. All women fulfilling the criteria of PAS either preoperative or intraoperative were included. Written informed consent was obtained from all participants. Maternal age, parity, mode of anesthesia, passing Central Venous Catheter, previous cesarean deliveries, gestational age at which cesarean delivery was performed, blood loss, the requirement of blood products, and outcome including perioperative CPR were noted for all cases. Cases shifted to ICU and those who developed anesthetic and surgical complications were also documented. For statistical analysis median age, parity, average blood loss with interquartile range was applied. Descriptive statistics such as mean, median, range, etc. were calculated for the study outcomes. Statistical comparison was made by applying sample t-test and chi-square test as applicable. A $P < 0.05$ was considered significant.

Results

A total of 109 patients of PAS from January 1st, 2014 to December 31st, 2017 were dealt with HFH. the preoperative diagnosis of PAS was made up of 100 (91.74%) and intraoperative diagnosis of 9 (08. 26%) patients. The median maternal age was 26 (18-40) years. The median maternal age in our setup is 26 years & median parity is 3.4 as shown in Table 1. The median gestational amenorrhea age is 36 weeks. Peripartum hysterectomy was done in 27 (24.77%) patients preemptively; balloon tamponade was done in 19 (17.43%) cases and internal iliac ligation in 09 (8.25%) cases. In the rest of 55 (54.25%) cases hysterectomy was done after failure to salvage the uterus. Median blood loss & interquartile range was 3203 ml and mean 8 RCC units were transfused. Indications for surgery were previous scar and placenta praevia (major degree). Surgical complications occurred in 21 (19.26%) patients and which were bladder injuries 17 (15.59%), gut injury in 02 (01.83%) patients, and vesicovaginal fistula in 02 (01.83%) patients as shown in Figure 1.
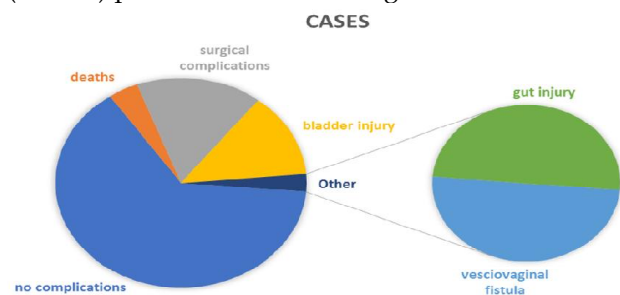

Figure 1: Diagrammatic representation of Surgical complications in patients

According to the mode of anesthesia, 100 (91.74%) patients received GA, and 09 (08.26%) patients received spinal anesthesia. In 06 (05.49%) patients, spinal was converted to GA. the difficult airway was noted in 04 (03.66%) patients and accidental dural puncture in none. Perioperative CPR was done in 05 (04.58%) cases. Patients shifted to ward was 0, HDU 54 (49.54%) & ICU 55 (50.45%). Patients extubated immediately were 66 (60.55%). Those who received mechanical ventilation were 43 (39.45%). The mean days of hospital admission were 04 days who were not ventilated and 10 days who were ventilated. Out of 109 cases, 83 survived uneventfully, and 21 developed complications. 05 patients expired in the following days. (01 immediately postoperative period, 02 in 1st 24 hours and 02 in 1st 48 hours. Risk factors are tabulated in Table 2.

Table 1: Statistics regarding patient parameters

Parameters	Mean/ median
median age (years)	26
median gestational age (week)	36
BMI (KG/m^2)	29.4

Table 2: Risk factors and statistics

Risk factors	Odds ratio	Confidence interval	P-Value
Advanced maternal age	1.13	1.089-1.194	<.0001
2 or more caesarian	8.6	3.536-21.078	<.0001
Placenta previa	51.4	10.646-24.390	<.0001

Discussion

Generally, regional anesthesia is the technique of choice for caesarian deliveries because of its proven benefits for both mother and fetus but for PAS we adopt general anesthesia because of concerns related to severe hypotension, loss of airway control, and profound coagulopathy associated with massive bleeding[2]. Though worldwide more and more centers are adopting regional anesthesia especially if the patient has no comorbid or degree of invasion is less[2]. ASA task force on obstetric anesthesia suggests that

GA may be the most appropriate approach in some circumstances including cases where severe hemorrhage is anticipated.

In our study anticipated PAS were 100 and unanticipated PAS were 09. In our case, no. of cases performed in GA are 100 out of 109, and the rest of the 9 cases started in spinal anesthesia and 6 of them were converted to GA. Central Venous Catheter is controversial as some authors report increased incidence of complications in the pregnant population (25% vs 15-20% especially infectious complications).[9] We passed central venous catheter in 26 patients because of difficulty in finding large-bore IV line & where monitoring of central venous pressures was required along with the use of vasoactive drugs.

MULTIDISCIPLINARY TEAM FOR PAS

1. Obstetricians team
2. Anesthesiologists team
3. Pediatrician
4. General surgeon
5. Blood bank physician
6. Radiologist

ANESTHETIC TECHNIQUE & RESUSCITATION STRATEGIES:
Our basic protocol consisted of an elective caesarian section with or without hysterectomy for which the following measurements were done.

1. Detailed and early pre-anesthetic assessment
2. Counselling (7% maternal and 9% fetal mortality)[2]
3. Informed high-risk consent
4. Booking bed and ventilator
5. Arranging blood products (10 units of cross-matched RCC, FFP, and platelets, depending upon the type of PAS, existing anemia & thrombocytopenia, comorbidities) [2]
6. Two experienced anesthesiologist
7. Two large-bore IV lines (14G & 16G)
8. Arterial line before induction
9. General endotracheal anesthesia
10. Planned resuscitation strategies

Blood products were arranged and kept in OR before starting the procedure. They should be arranged keeping in mind the patient's hematological status, comorbid & degree of PAS. In the case of hemorrhage, crystalloids and colloids were used and Damage

Control Resuscitation is instituted. In emergency cases when a diagnosis was made intraoperatively, anesthesiologists made calls to the blood bank to initiate blood product release also known as Massive Transfusion Protocol (MTP). We used the crystalloid minimally considering delusional thrombocytopenia. Colloids are also avoided because they cause platelet dysfunction, inhibit fibrin polymerization & fibrinolytic activity. [10]

Guidelines recommend 2-3g/L of fibrinogen levels in PAS for adequate hemostasis so cryoprecipitate use is advised. Though due to limited resources, we used only in 12 cases. We used 2g tranexamic acid on an early basis according to WOMAN TRIAL which has shown a decrease in morbidity and mortality. The use of recombinant factor VII is promising in reducing hemorrhage successfully but we have employed only one in our cases. After initiation of massive transfusion, we start serial laboratory tests e.g. blood CP, PT, APTT, platelet counts & fibrinogen levels and serum electrolytes on an hourly basis. Patients having hemorrhage shock and massive transfusion have the potential for ICU admission and postoperative ventilation.[2]

Conclusion

The rate of PAS is increasing persistently in parallel to the increasing rate of caesarian deliveries. Catastrophic hemorrhage comparable to major trauma hemorrhage is associated with PAS. Antenatal screening, adequate preparation, and multidisciplinary team approach have shown a significant reduction in morbidity and mortality of PAS.

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