JMSR
Journal of Medical and Surgical Research

JMSR 2024 Vol XI, n 1: 1348-1357

PLACENTAL ABRUPTION: UNVEILING PERSISTENT CHALLENGES AND MANAGEMENT STRATEGIES FROM THE OBSTETRICAL INTENSIVE CARE UNIT EXPERIENCE IN FES, MOROCCO

Fatima Zahrae Benchekroun [1], Ilias Jerrar Oulidi [1], Kaoutar Chafai [1], Soufiane Bengelloun Zahr [1], Djoudline Doughmi [2] , Said Benlamkaddem [2] , Mohamed Adnane Berdai [2] , Mustapha Harandou [2]

1 Faculty of Medicine, Pharmacy and dentistry of Fes, Sidi Mohamed Ben Abdellah University, Fez, Morocco.
2 Department of Pediatric and Maternal Anesthesiology and Intensive Care, Hassan II University Hospital, Sidi Mohamed Ben Abdellah University, Fez, Morocco.

Corresponding Address: Fatima Zahrae Benchekroun, **MD**. Faculty of Medicine, Pharmacy and dentistry of Fes, Sidi Mohamed Ben Abdellah University, Fez, Morocco. **E-mail**: fatimazahrae.benchekroun@usmba.ac.ma

Published in September 2024
doi: ……---

Abstract

Introduction: Postpartum haemorrhage (PPH) remains the leading cause of maternal mortality, with placental abruption (PA) being a serious and challenging etiology. Late diagnosis and inadequate management of PA can exacerbate PPH and worsen maternal outcomes. This work aims to analyse the epidemiological, clinical and Para-clinical profile of PA in the Intensive Care Unit (ICU); as well as to determine the profile of coagulopathy in PPH and to discuss various treatment modalities. **Materials and Methods:** This retrospective, descriptive, non-interventional study reviews cases of PA requiring ICU admission at Hassan II University Hospital in Fez from January 2019 to December 2023. **Results:** Forty-two patients met the inclusion criteria, with a mean age of 32 years. Primiparae constituted 33.4% of the cohort. 78.6% lacked prenatal care. The average gestational age was 32 weeks. Preeclampsia was the predominant risk factor (57.1%). Symptoms included mostly slow fetal movements, hemorrhage, and abdominal rigidity. At admission, 26% of patients exhibited hemorrhagic shock. General anesthesia was used in 82.5% of cases. In the operating room, 12% of patients received fibrinogen, and 50% received tranexamic acid. Blood transfusions were administered to 67% of patients, with an average of 2.14 packed red blood cells (PRBCs), 5.3 platelets (PLTs), and 3.5 fresh frozen plasma (FFP). Surgical interventions included hysterectomy, B-Lynch procedure, and vascular ligature. The mean duration of mechanical ventilation in the ICU was 3.66 days. The maternal mortality rate was 9.5%, and five newborns survived to discharge. **Conclusion:** This study emphasizes the need for a multidisciplinary approach and early intervention to manage PPH from PA effectively, and highlights the importance of national programs to address modifiable risk factors.

Keywords: Fibrinogen - Placental Abruption; Postpartum Hemorrhage; Tranexamic Acid; Transfusion; Morocco.

INTRODUCTION

Postpartum hemorrhage (PPH) remains a critical concern in obstetrics, endangering the lives of mothers and infants worldwide. Among its various causes, placental abruption - a sudden and often unexpected separation of the placenta from the uterine wall - poses a particularly severe risk. This condition can abruptly transform a normal pregnancy into an urgent struggle for survival, leading to catastrophic hemorrhage and fetal distress. Despite extensive research and clinical efforts, the precise causes of placental abruption remain unclear, and many questions persist about its risk factors and optimal management. Our study aims to address these challenges by examining the epidemiological, clinical, and paraclinical aspects of placental abruption in the University Hospital Hassan II in Fez from the initial diagnosis in the emergency room through to the operating room and intensive care unit.

MATERIALS & METHODS

This is a retrospective, descriptive study spanned from January 2019 to December 2023, analyzing cases of placental abruption over this period. The research focused on patients diagnosed with placental abruption who required hospitalization in the mother-child intensive care unit at Hassan II University Hospital in Fez. Inclusion criteria were a diagnosis of placental abruption confirmed by ultrasound and subsequently verified in the operating room, necessitating hospitalization in the obstetrical intensive care unit. Exclusion criteria included incomplete medical records, prior surgical management elsewhere, and unconfirmed diagnoses of placental abruption. Data were collected from electronic medical records, encompassing epidemiological details, diagnostic interventions, therapeutic strategies, and clinical progress. The data were meticulously organized using Microsoft Office Excel 2022 and analyzed with IBM SPSS version 25. Descriptive analysis presented qualitative variables as percentages and quantitative variables as means, standard deviations, medians, minimums, and maximums.

RESULTS

Our study focused on 42 patients admitted to the obstetrical Intensive Care Unit (ICU) due to placental abruption. Of these, 40 underwent a cesarean section. Within a cohort of 12,775 emergent cesarean sections performed during the study period, this represents a prevalence of 0.31% for cesarean deliveries complicated by urgent placental abruption. The mean age of the patients was 31 years (±6.7), with a median age of 32 years ranging from 17 to 42 years. All patients were unemployed, primarily occupied with household responsibilities. The majority (60.6%) hailed from the Fez region, with the remaining (39.4%) originating from rural areas. A significant portion (73.7%) were referrals from regional hospitals, while 26.3% presented directly to our emergency department. Among the patients, 33.4% were primigravidae, and 66.6% were multigravidae, with gestational ages ranging from 20 to 40 weeks. Regarding parity, 42.9% were nulliparae, while others had between 1 to 7 deliveries. Notably, 78.6% of patients did not receive prenatal care, underscoring limited access to medical follow-up during their pregnancies. The mean gestational age at the time of placental abruption was approximately 31.91 weeks (±5.68). 81% of patients had at least one risk factor associated with placental abruption, with preeclampsia being the most prevalent (57.1%), followed by previous fetal demise (26.2%) and past cesarean sections (14.3%). The most common reasons for consultation included slow fetal movements (81%), hemorrhage (71.4%), and abdominal rigidity (52.4%). Approximately 26% of patients presented with hemorrhagic shock upon admission. The mean Shock Index was 0.95 (±0.39), and the mean blood loss was 864 ml (±727). Laboratory testing upon admission confirmed severe anemia (Hb < 7 g/dL) in 28.5% of patients, moderate anemia (7 < Hb < 10.5 g/dL) in 59.5% of patients, and thrombocytopenia (Plts < 150k/µL) in 52.3% of patients. Renal insufficiency was observed in 31% of patients, elevated liver enzymes in 14.2% of patients, and abnormalities in prothrombin time and kaolin cephalin time were prevalent among the majority of our patients **[Table 1]**. Upon entering the operating room (OR), all patients underwent comprehensive monitoring, including three-lead electrocardiogram (ECG), non-invasive blood pressure (NIBP), and peripheral oxygen saturation. General anesthesia was utilized in 82.5% of cases, with 12.1% transitioning from spinal to general anesthesia. Oxytocin was employed in 95.2% of patients, often supplemented with misoprostol (35.7%) to enhance uterine tonicity. Vasopressors, predominantly ephedrine and diluted norepinephrine, were required in 35.7% of cases to manage blood pressure fluctuations. Additional medications such as nicardipine, alpha-methyldopa, and magnesium were used to prevent complications such as eclampsia. Rotational thromboelastometry (ROTEM), utilized in 11.9% of patients, provided crucial insights into clotting parameters, guiding intraoperative fibrinogen administration in 11.9% of cases. Tranexamic acid was promptly administered to 47.6% of patients upon confirmation of hemorrhage, contributing to effective bleeding control. 67% of parturients required transfusion, receiving on average 2.14 units of packed red blood cells (PRBCs), 5.3 units of platelets (PLTs), and 3.5 units of fresh frozen plasma (FFP). Calcium electrolytes were concurrently administered in 38.1%. Hysterotomy and hysterorrhaphy were uncomplicated in 50% of cases, while the remaining 50% necessitated advanced interventions due to unmanageable bleeding, including techniques like B-Lynch and vascular ligature utilized in 45.2% of cases. Hysterectomy was ultimately performed in 4.8% of patients following unsuccessful initial interventions. Unique cases included interventions such as pyosalpinx drainage, internal iliac vein suture, and packing retention. Postoperatively, our study highlighted that 78.6% of deliveries resulted in stillborn infants, with 21.4% of neonates born alive. 44.4% of these neonates did not survive, while the remaining infants achieved viability despite premature birth. In the ICU, 21.4% of patients

received a central venous catheter, and 9.5% required an arterial line. Remarkably, 81.8% of patients were successfully extubated on the day of ICU admission, with a mean ventilation duration of 3.66 days. Transfusions, vascular fillings, antibiotics and electrolyte corrections continued as needed based on postoperative lab tests **[Table 1]**, with diuretics managing diuresis in 16.7% of patients and one patient requiring hemodialysis due to resistance. Fibrinogen was re-administered in 14.3% of patients. Norepinephrine support was maintained postoperatively in 9.5% of patients. Most patients (71.4%) did not experience organ failure, though complications such as HELLP syndrome (14.3%), renal insufficiency (4.8%), myocardial infarction (4.8%), pleural effusion (2.4%), and pulmonary edema (2.4%) were noted. The mean ICU hospitalization duration was 3.17 days, and maternal mortality was 9.5%

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Table 1: Comprehensive Analysis of Relevant laboratory tests upon admission in the emergency room (ER) and during ICU Hospitalization

Laboratory Results	ER	ICU
HB (14-18 g/dL)	8.28 ± 2.2	8.28 ±1.48
WBC (4-10×10³/uL)	18873 ± 6623	12029.49 ± 4469.28
PLTS (150-400×10³/UL)	154×10³ ± 89×10³	223.28×10³ ± 130.69×10³
PT (70-100%)	83 ± 24.88	96.55 ± 10.59
CKT (27.6-38.4 s)	32.52 ± 18.76	31.78 ±6.6
Fibrinogen (2-4g/L)	-	2.66 ±1.84
ALT (0-35U/L)	27.7 ± 38.05	97.79 ± 447.28
AST (0-35U/L)	51.28 ± 50.83	166 ± 767.38
GGT (5-40U/L)	-	19.97 ± 14.65
BUN (0.17-0.43 mg/dL)	0.94 ± 3.66	0.39 ± 0.49
Creatinine (6.6-10.9 mg/dL)	11.47 ± 5.7	10.32 ± 14.86
K (3.5–5 mEq/L)	-	4.25 ± 1.17
NA (136–146 mEq/L)	-	135.38 ± 2.79
Albumin (35–55 g/L)	-	26 ±4.01
Ca (84–102 mg/L)	-	74.48 ± 7.95
Procalcitonin (<0.05 ng/mL)	-	7.06 ± 7.97
CRP (0-5 mg/L)	-	97.83 ± 83.31
24H Proteinuria (< 0.15 g/24H)	-	2.11 ± 4.13

Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Blood Urea Nitrogen (BUN), Calcium (Ca), Cephalin-Koalin Time (CKT), C-Reactive Protein (CRP), Hemoglobin (Hb), Potassium (K), Sodium (Na), Platelets (PLTS), Prothrombin Time (PT), and White Blood Cells (WBC).

DISCUSSION

Premature placental abruption is the separation of the placenta before the delivery of a fetus, typically occurring from the 21st week of pregnancy onward. This process leads to the formation of a retroplacental hematoma with varying size within the decidual layer. It is relatively uncommon but serious complications can arise posing significant risks to both the mother and the fetus [1,2]. The prevalence of placental abruption varies globally, estimated at 0.6 to 1% in the United States, lower (0.4–0.5%) in Nordic countries [3], and higher (3.5–3.8%) in certain South Asian countries [4]. Interestingly, the prevalence has been on the rise in the United States and Canada but declining in other European nations, such as Finland, Denmark, Norway, Sweden, and Spain [5]. In our hospital, a retrospective 2008 study of Dr Zrihni focused on 92 parturients experiencing placental abruption from January 2005 to December 2007, revealing a prevalence of 0.54% [6]. In our present study, we were only able to calculate the prevalence of C-sections for placental abruption requiring ICU admission among all types of C-sections performed, resulting in a prevalence of 0.31%.

In the literature, it has been consistently observed that both adolescent pregnancies and advanced maternal age are correlated with an elevated risk of placental abruption [7,8]. In our study, we observed that the mean age was 31±6.7 with 5% below the age of 20, while a significant 62% belonged to the over-30 age group, aligning closely with findings reported in the existing literature [9,10]. In contrast, the 2008 study reported a mean age of 28.5, with 41.2% of participants aged over 30 and 7.6% falling below the age of 20 [6]. Women today often marry later due to social and career reasons, which also leads to later pregnancies. Changes in societal expectations and career goals contribute to this shift. However, older pregnancies come with increased risks, including a higher likelihood of complications like placental abruption.

In 2008, records revealed that 79.34% of pregnancies lacked any form of follow-up. In our current study, a parallel scenario unfolds, with 78.6% of pregnancies lacking prenatal care. The absence of regular monitoring increases the likelihood of missing crucial factors in the origin of placental abruption. Without primary prevention measures through adequate follow-up, we are compelled to rely on secondary or even tertiary prevention strategies, facing potentially fatal consequences. Placental abruption is associated with a myriad of risk factors, as indicated by numerous studies in the literature. Notably, pregnant individuals with chronic hypertension or preeclampsia, especially severe forms, face a significantly higher risk of abruption [11,12]. Additionally, advanced maternal age, single marital status, and placenta previa have also been classified at high risk for PA [13]. Furthermore, conditions such as diabetes, preterm premature rupture of membranes, chorioamnionitis, and oligohydramnios contribute to increased risk [12,14].

A striking observation in our comparative analysis is the notable difference in the prevalence of preeclampsia as a risk factor **[**refer to **Table 2]**. In the earlier study, preeclampsia accounted for a modest 1.08% of cases, whereas in our recent investigation, it emerged as the most prevalent risk factor, affecting more than 50% of the cases.

Table 2: Comparison of Risk Factors for Placental Abruption: Averaging Across our Study and 2008 Study[6].

Risk Factor	2008's Study	Our Study
Preeclampsia	1.08%	57.1%
Past Fetal Demise	57%	26.2%
Past C-Section	2.17%	14.3%
Gestational Hypertension	1.08%	4.8%
Chronic Hypertension	6.52%	--
Traumatic Incident	1.08%	4.8%
Placenta previa	9.78%	24%
Previous Placental Abruption	--	2.4%
Previous Postpartum Hemorrhage	--	2.4%
Leiomyomas	1.08%	--
Macrosomia	--	2.4%
Twin Pregnancy	3.26%	--

Gestational Diabetes	--	2.4%
Diabetes Mellitus	1.08%	--
Cardiac Disease	1.08%	2.4%
Anemia	1.08%	2.4%
Polycystic Kidney Disease	--	2.4%

During the compensatory phase of shock, initial vital signs often fall within the normal ranges. That is why studies have shown that the shock index could be one of the metrics to adopt in the emergency department upon arrival of the patient. It calculates the ratio of heart rate (HR) to systolic blood pressure (SBP) [15]. Its utility has been explored not only as an indicator of early hemorrhagic shock in PPH but also in patients experiencing shock due to various conditions, including trauma, hemorrhage, cardiac issues like myocardial infarction, pulmonary embolism, sepsis, and other diseases [16]. The currently acknowledged standard range for this measure is 0.5–0.7, and there is supporting evidence suggesting that values as high as 0.9 are considered acceptable [17-20]. However, values approaching 1.0 signify deteriorating hemodynamic status and the onset of shock [15]. An elevated shock index has been linked to unfavorable maternal outcomes, including the need for massive blood transfusion, decreased levels of hemoglobin and fibrinogen, ICU admission, and increased morbidity and mortality [21]. In fact, El Ayadi et al. proposed a lower shock index threshold of 0.9, as a necessity for referral to a tertiary facility or vigilant monitoring within tertiary care. A higher SI thresholds of 1.4 should prompt urgent intensive treatment and 1.7 is an indicator of a high risk of adverse events [21].

A notable evolution in our approach to diagnose hemorrhagic shock distinguishes our study from the 2008 investigation. In 2008, hemorrhagic shock was evaluated based on blood loss and blood pressure drop. In our current study, we adopted a different approach, utilizing the shock index at admission to estimate the hemorrhagic risk. The mean shock index was calculated to be 0.95 ± 0.39, ranging from a minimum of 0.5 to a maximum of 1.9 and with 33.33% of patients with more than 0.9. Regardless of the manifestation, hemorrhage is characterized by a reduction in blood volume, which leads to an initial elevation in white blood cell count, while hemoglobin concentration, erythrocyte volume, platelet count, prothrombin activity, and serum albumin decrease [22].

Atallah et al. underlings the significance of monitoring fibrinogen levels in placental abruption, especially when associated with intrauterine fetal demise and even when the fibrinogen is within the conventional normal range of 2 to 3 g/L. In the absence of disseminated intravascular coagulation (DIC) upon admission, persistently low fibrinogen levels should prompt repeated assessments and planning for labile blood products and fibrinogen transfusion [23]. Wang et al demonstrated the usefulness of pre-delivery fibrinogen levels in diagnosing the severity of placental abruption and highlighted a significant risk of postpartum hemorrhage (PPH) when levels decrease to ≤1.55 g/L. Additionally, a notable association with severe adverse neonatal outcomes was observed when fibrinogen levels drop to 2.50 g/L [24]. In recent updates, Ozkavak et al highlights a new finding: the creatinine–fibrinogen ratio (CFR) as a potential predictive marker for placental abruption and its associated adverse outcomes [25]. It seems to be a practical marker for a good prediction of composite adverse outcomes. The 2008 study did not include fibrinogen data, while our findings showed a mean value of 2.66 (SD 1.84), with 20% of patients having levels below 2 g/L. Both studies revealed a significant prevalence of severe anemia, leukocytosis, thrombocytopenia, elevated liver enzymes, renal insufficiency, and prolonged prothrombin and kaolin cephalin times, consistent with existing literature.

Additionally, we identified six cases of HELLP syndrome, compared to four in 2008. The preferred mode of delivery for such complicated pregnancies has commonly been known to be vaginal [26-28]. Cesarean delivery presents concerns of increased bleeding and potential adverse events, including hemorrhagic shock, coagulopathy [27,29,30]. However, vaginal delivery (VD) may be time-consuming in this context with the added risk of serious complications. The choice of delivery route necessitates a careful balance to mitigate potential risks and optimize outcomes. Wada et al's study compared the two routes in a very large sample and concluded that significantly higher bleeding occurred during cesarean delivery compared to vaginal delivery. Nevertheless, cases associated with VD were linked to severe maternal adverse events, such as death and uterine rupture. The choice of delivery route should therefore be carefully assessed, considering diverse backgrounds and specific situations [31]. In our study, a mere 4.7% of patients opted for VD, with the majority promptly transferred to the operating room. In contrast, the 2008 data revealed a higher rate of 17.4% opting for VD, while the majority underwent

C-section. ROTEM can be invaluable for assessing perioperative clotting status. User-friendly and guiding standard therapeutics in cases of coagulopathy, it can indicate platelet transfusions, fibrinogen supplementation, and in some instances, the use of factor VII. This tool is available in our department and has been utilized in certain patients to guide coagulopathy treatment. The debate over the volume of fluid to be infused is minimal, as recommendations for hemorrhagic shock agree on low-volume resuscitation to avoid dilution of coagulation factors and hemoglobin, thereby exacerbating the hemorrhagic syndrome [32]. A dose of 20 ml/kg is typically sufficient to restore blood volume without causing dilution-related complications. The efficacy of tranexamic acid in severe hemorrhages is undeniable. Its administration is recommended during the early hours of hemorrhage to enhance its effectiveness. It should not be initiated beyond the 3rd hour following the occurrence of trauma with hemorrhagic shock [32]. In our series, all patients received it in the operating room.

The French Society of Anesthesia and Intensive Care recommendations from 2015 emphasize the early initiation of plasma transfusion, ideally concurrently with packed red blood cells (PRBCs) [32]. Plasma transfusion should be initiated before obtaining test results in case of massive hemorrhage, with a recommended fresh frozen plasma (FFP) to PRBC ratio between 1/2 and 1/1. Early platelet transfusion is also recommended, typically with the second transfusion prescription, to maintain platelet counts above 50 G/L. Ionized hypocalcemia can occur during massive transfusion due to the citrate used as an anticoagulant in labile blood products (especially FFP). Also, monitoring the ionized calcium concentration is recommended during massive transfusion to maintain it within normal values. It should be maintained at > 0.9 mmol/L by administering calcium chloride through a separate intravenous line independent of the transfusion [32].

Research indicates unanimous agreement among guidelines that factor VIIa should be reserved for instances of life-threatening hemorrhage, given its high cost, uncertain effectiveness, and potential risks of adverse thromboembolic events [33]. It is not recommended as a first-line treatment in transfusion therapy or for controlling bleeding. In our study, only one patient was administered six doses of this factor. The rest were unable to receive it, likely due to its high cost and limited availability.

As for uterotonic, we administered intravenous oxytocin infusion as the primary agent. The dosing of oxytocin ranges widely, from a slow intravenous (IV) bolus of up to 10 IU to an infusion of up to 40 IU over 4 hours, or a 10 IU intramuscular (IM) injection [34].

Of the patients, 82.5% underwent general anesthesia, while the rest went for a neuraxial anesthesia. According to Ghodki and Sardesai et al, the preferred anesthetic approach for placental abruption is general anesthesia with an endotracheal tube, even for hemodynamically stable patients. This choice is driven by the elevated risk of postpartum hemorrhage commonly associated with placental abruption cases [35]. On the other hand, Akter et al. highlights that with vigilant perioperative event monitoring, spinal anesthesia emerges as a secure alternative technique to general anesthesia (GA) or epidural. This holds true even in situations involving altered consciousness or restlessness when managed by an experienced and skilled anesthesiologist [36]. As for the Network for the Advancement of Patient Blood Management, Haemostasis and Thrombosis (NATA) guidelines, it is recommended to opt for local or regional techniques to manage airways and minimize pulmonary aspiration risks, if cardiovascular stability and absence of coagulopathy is confirmed. In the latter case, a general anesthetic with oro-tracheal intubation is advised. Then, a rapid sequence induction is preconized [37]. In cases where neuraxial anesthesia is planned, precautions should address potential situations for converting to general anesthesia, such as difficult airway. The risk of conversion to GA ranges from 8% to 45%, with higher rates in situations without prior suspicion of placental pathology, especially in low-income countries [38]. In fact, our study showed that there was 12.1% of conversion to general anesthesia. Some factors like the need for hasty volume resuscitation, patient discomfort, and enhanced surgical exposure were involved in this conversion [39]. Propofol should be used cautiously in cases of shock due to its potential hemodynamic aggravation. Instead, ketamine and etomidate should be considered as preferred agents in such situations [35]. We ensured neuroprotection by administering magnesium sulfate via intravenous infusion, utilizing both loading and maintenance doses.

In cases where medical treatments prove insufficient, surgical interventions become imperative to address postpartum hemorrhage effectively. Various mechanical, radiological and surgical options are accessible for managing the condition; from Balloon Tamponade, uterine compression sutures, vascular ligations, peripartum Hysterectomy, and endovascular interventions. Guidelines universally recommend uterine tamponade following the ineffectiveness of uterotonics using different devices, packing gauzes, coated with a hemostatic agent into the uterus. This technique should only serve as a bridge to more invasive definite methods [33]. One patient of ours received one packing that she retained throughout her stay in the ICU. Uterine compression sutures, also

named B-Lynch sutures, occur by mechanically compressing uterine vascular sinuses without occluding the uterine arteries or the uterine cavity [40]. Vascular ligations aim primarily to reduce blood flow to the uterus to cease life-threatening hemorrhage. This approach starts with bilateral uterine artery ligation, progresses to bilateral ovarian artery ligation, and, in extreme cases, includes internal iliac artery ligation. This last step requires expertise to minimize the risk of vessel and ureter injury and is considered when previous measures prove insufficient [41]. In our Serie, the utilization of B-Lynch and vascular ligature techniques was prominent in 45.2% of cases, emerging as the predominant approaches in our management protocol. Hysterectomy can be total or subtotal, with the latter being the preferred choice unless there is a trauma to cervix or lower uterine segment [41]. In our study, It was performed in the remaining 4.8% after prior methods failed to control the hemorrhage. In 26.2% of our patients, a couvelaire uterus was observed during either cesarean section or post-hysterectomy. Couvelaire uterus is characterized by atony and is prone to postpartum hemorrhage, necessitating aggressive management to prevent complications such as disseminated intravascular coagulation and exsanguination [42].

Most guidelines recommend transcatheter arterial embolization. This intervention is advised before considering surgical procedures [33]. Shahin and Pang found that prophylactic balloon occlusion of the abdominal aorta was associated with fewer complications compared to the other arteries, reduced blood loss, and lower radiation doses compared to other modalities [43]. However, our patients didn't receive any endovascular treatment for it wasn't available.

In our study, stillbirths comprised the majority of deliveries, accounting for 78.6% of cases, with prematurity being a significant factor in 77.7% of neonatal deaths. In contrast, the 2008 study reported a stillbirth frequency of 40%, with prematurity and neonatal deaths contributing significantly. Ni et al identified a poorer prognosis for newborns in cases of placental abruption associated with pre-eclampsia [44], which is matching with our highest risk factor noted in our study. Numerous studies have previously documented that a placental disruption surface area of ≥45 or 50% poses a risk factor for stillbirth [45].However, it's important to note that we were unable to ascertain this information in our study due to the lack of relevant data. Elkafrawi et al's results highlighted that a gestational age of less than 31 weeks and delivery via cesarean section were statistically significant risk factors for heightened neonatal morbidity and mortality during univariate analysis [46]. These finding are consistent with our study, which observed a mean gestational age of 31 weeks, further reinforcing the association.

Postoperative analgesia is a mandatory treatment for patients undergoing PA. In the majority of cases, it is multimodal, combining intravenous, spinal routes, and in some cases, the addition of TAP block. In our series, the majority of patients received intravenous analgesia regimen, consisting of acetaminophen, nefopam and morphine titrated intravenously immediately postoperatively. Some parietal blocks can be used postoperatively following C-sections to reduce the need for morphine. These include the Transversus Abdominis Plane Block (TAP block) and the Quadratus Lumborum Block (QLB Block). Both techniques seem to be effective only in the absence of intrathecal morphine [47]. A recent meta-analysis from 2020 conducted by XU M et al. with over 900 patients found better analgesia with QLB compared to no block or placebo [48], with a reduction in opioid consumption at 24 and 48 hours, still in the absence of intrathecal morphine [49]. In our series, the TAP block was used in only 4.8% of our population. This is likely due to the fact that sedation was maintained on the first day of the intervention, with the addition of morphine-like drugs. The Quadratus Lumborum Block (QLB) is not routinely done in our department and wasn't noted in any of the data. Thromboprophylaxis is necessary as soon as possible, as emergency cesarean section is a major thromboembolic risk factor. What could delay prescription is the persistence of hemorrhagic shock or the presence of DIC. It should be based on mechanical means (intermittent elastic compression) or pharmacological means (low molecular weight heparin or unfractionated heparin in the presence of renal failure). The precise timing of their introduction depends on achieving adequate hemostasis postoperatively. It is preferable to start them within 6-8 hours following the bleeding cessation [50]. Iron supplementation should also be prescribed to help with the subsequntaent anemia.

Our study encountered four fatalities (n<5), which limited our ability to calculate and analyze the mortality rate due to the small number of cases.

CONCLUSION

The severity of placental abruption, with potential complications like disseminated intravascular coagulation, respiratory, hepatic, and renal collapse, and fetal distress, demands a collaborative approach from obstetricians, anesthesiologists, intensivists, pediatricians, and skilled nurses. Our descriptive and retrospective study, based on a small sample from our region, highlighted the rarity of severe placental abruption. Despite a low maternal mortality rate,

indicative of effective management protocols, there was a notable number of stillbirths. This underscores the need for measures to prevent avoidable deaths. Suggested actions include:

- Educating women in rural areas about prenatal care and improving access to health insurance, especially for low-income individuals.
- Ensuring follow-up care for diagnosed pathologies.
- Equipping local and regional hospitals with fully prepared teams to reduce management delays and improve outcomes.

Conflict of interests: None.

Funding: Nothing to declare.

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