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Causes of Postpartum Haemorrhage Seen in Patients Referred to Jinnah Postgraduate Medical Center (JPMC)

Fatima Nasir[1], Saba Khan[1], Simrun[1], Tamkeen Zehra[1], Memoona Kashaf[1], Aisha Nasir[2]

[1]Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Centre, Karachi, Pakistan
[2]Department of Family Medicine, Indus Hospital and Health Network, Karachi, Pakistan

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Correspondence to: Fatima Nasir, Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Centre, Karachi, Pakistan
Email: fatima.jsmu2020@gmail.com

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ABSTRACT

Background and Aim: Postpartum hemorrhage (PPH) remains an important contributor to maternal illness and mortality, especially in developing countries. Prompt identity of its causes is necessary for timely management and improvement in maternal outcomes. Therefore, the present study aimed to determine the causes of postpartum hemorrhage in patients referred to Jinnah Postgraduate Medical Centre, Karachi. **Patients and Methods:** This cross-sectional study investigated 104 postpartum hemorrhage (primary or secondary) cases in the Obstetrics and Gynecology Department, Jinnah Postgraduate Medical Centre (JPMC), Karachi from March 2024 to March 2025. Patients referred from peripheral healthcare facilities either booked or unbooked cases, preterm and term deliveries, and inpatients were included. Data obtained from medical records, including demographic variables (age, marital status, parity, booking status), obstetrical history (gestational age, mode of delivery), type of PPH (primary or secondary), and specific causes (e.g., uterine atony, trauma, uterine rupture, placenta accreta spectrum, infection, uterine inversion, arteriovenous malformation, and coagulation disorders). SPSS version 26 used for data analysis. **Results:** The current study included 104 patients with postpartum hemorrhage; the most affected age group was 21–30 years 48 (46.2%) cases. The incidence of primary and secondary PPH was 96 (92.3%) and 8 (7.7%), respectively. Anemia was the most prevalent risk factor found in 26 (25%) cases followed by Prolonged Labor 12 (11.5%) and Eclampsia 8 (7.7%) cases. Atonic uterus emerged as the most prevalent cause of PPH, accounting for 73 (70.2%) cases. Traumatic PPH contributed to 20 (19.2%) cases and retained product of conception (RPOC) 11 (10.6%) cases. Of the total cases, 44 (42.3%) patients underwent surgical intervention whereas 60 (57.7%) were medically managed. **Conclusion:** Atonic uterus, identified as a major cause of postpartum hemorrhage (PPH), followed by traumatic and retained products of conception. These findings emphasize the need of prompt recognition and management of the atonic uterus, as well as effectively reducing the incidents and severity of PPH for trauma and incomplete placental expulsion.

INTRODUCTION

Postpartum hemorrhage (PPH) has become a major cause of maternal illness and mortality globally. Blood loss exceeding 500 mL following vaginal delivery or more than 1500 mL during cesarean section usually referred as PPH [1]. An alternative clinical definition involves blood loss, which causes hypovolemia, a 10% decline in hematocrit, or requires blood transfusion regardless of the mode of delivery [2]. About 13% of all births resulted in more than 1000 ml of blood loss in PPH-a level is considered a possible life threatening while severe hemorrhage occurs in about 1 in every 1000 delivery [3]. Annually, an estimated 600,000 maternal deaths reported worldwide, with 99% of developing countries; PPH alone is about 25% of these deaths [4]. In Pakistan, the reported prevalence of PPH was 34% [5]. The most common cause of the PPH is the uterine atony responsible for 75–90% cases. Other contributing factors include placenta previa, placenta accreta, lower genital tract lacerations, coagulopathies, uterine inversion, and uterine rupture. Pregnancy -related death is a major cause of early mortality in women worldwide; Estimated 500,000 women die every year for this reason, which accounts for one -fourth of all fatalities [6]. Despite the advancement in maternity care, PPH contributes significantly to the early maternal mortality, with all maternal deaths responsible for a quarter of death. It is 1–5% in both developed and developing countries and remains the most important cause of maternal morbidity and mortality. PPH is often unexpected and can affect any patient, emphasizes the need for universal alertness and

quick intervention [7, 8].

Postpartum hemorrhage (PPH) is classified into two types: primary and secondary. Primary PPH, defined as a loss of blood more than 500 mL after vaginal deliveries or more than 1500 mL after caesarian section, which occurs within the first 24 hours of delivery. This affects about 5% of all delivery [9]. Secondary PPH refers to excessive vaginal bleeding that arises 24 hours after the completion of the third stage of labor [10]. Postpartum bleeding (PPH) can result in significant maternal complications, including anemia, hypovolemic shock, dissemination intravascular coagulation (DIC), and acute tubular necrosis, which can eventually lead to kidney failure. In addition, PPH management is often associated with its set of complications. Many blood transfusions can lead to transfection-related reactions including acute respiratory distress syndrome (ARDS) and sepsis. Additionally, uterine packing may increase the risk of infection, while postpartum hysterectomy bears the capacity for surgical injuries, such as bladder trauma [11]. Continuous efforts are required to improve cost-effective and accessible preventive and medical intervention to improve the management of postpartum bleeding (PPH) in low-resources settings. The study was held at the Jinnah Postgraduate Medical Center, a tertiary care facility, for evaluating the causes of PPH and clinical outcomes. The purpose of the findings is to identify existing gaps in care and help to indicate targeted strategies aimed at enhancing patient outcomes in PPH cases.

METHODOLOGY

Study Design and Setting

This cross-sectional study was conducted at the Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Center (JPMC), Karachi over a period of one year from March 2024 to March 2025. 104 cases of postpartum hemorrhage (PPH) evaluated during this period, including both primary and secondary types.

Inclusion and Exclusion Criteria

Women who had experienced postpartum hemorrhage and referred by peripheral health facilities. Both booked and unbooked cases were included, as well as preterm and term delivery, and patients undergoing vagina or caesarean delivery. Patients who experience bleeding due to reasons unrelated to postpartum hemorrhage, such as trauma, polyps, or cervical erosion, patients with a known history of bleeding disorders, and patients receiving anticoagulant therapy, which include drugs such as warfarin or heparin excluded.

Data Collection Procedures

The data extracted from the patient medical records using a structured proforma included demographic details (age, matrimonial status, parity and booking status), obstetric history (gestational age and mode of delivery), type of postpartum bleeding (classified as primary or secondary), and underlying causes. The specific etiologies assessed included uterine atony, genital tract trauma, uterine rupture, placenta accreta spectrum, uterine inversion, infection, arteriovenous malformation, and coagulation disorders.

Data analysis

Descriptive statistical analysis done using the SPSS version 26. The quantitative variables presented as a means with standard deviations, while the range of variables were expressed using frequencies and percentage. The causes of postpartum hemorrhage stratified based on gestational age, mode of delivery, and type of PPH (primary or secondary). After stratification, 95% confidence interval and significance of 5% ($P < 0.05$) applied to the Chi-Square Testing to evaluate associations between different causes and variables.

RESULTS

A total of 104 patients diagnosed with postpartum hemorrhage (PPH) investigated with mean age of 29.52 ± 5.82 years. Based on age distribution, the most cases 48 (46.2%) occurred in women between the ages of 21 and 30 years followed by 31-40 years. Regarding the classification of PPH, primary PPH was quite common, affecting 96 patients (92.3%), while secondary PPH was seen in 8 cases (7.7%). The analysis of the underlying risk factors showed that the anemia was the most prevalent, identified in 26 (25%) patients, followed by prolong labor 12 (11.5%) cases, and eclampsia, observed in 8 (7.7%) patients. When evaluating the specific etiology of the postpartum hemorrhage, the uterine atony found to be the major cause, accounted for 73 cases (70.2%). Traumatic causes of PPH, such as genital tract lacerations identified in 20 19.2%) patients, while the retained products of conception (RPOC) accounted for 11 (10.6%) cases. In terms of management strategies, 44 (42.3%) cases required surgical intervention, while the remaining 60 (57.7%) patients medically managed. The choice of treatment determined by the severity of bleeding, the underlying cause and the clinical condition of the patient.

Table 1

Age Distribution of Patients with PPH (N=104)

Age Group (Years)	Frequency (n)	Percentage (%)
≤20	14	13.5%
21–30	48	46.2%
31–40	32	30.8%
>40	10	9.6%
Total	104	100%

Table 2

Type of Postpartum Hemorrhage (N=104)

Type of PPH	Frequency (n)	Percentage (%)
Primary PPH	96	92.3%
Secondary PPH	8	7.7%
Total	104	100%

Table 3

Risk Factors Associated with PPH (N=104)

Risk Factor	Frequency (n)	Percentage (%)
Anemia	26	25.0%
Prolonged Labor	12	11.5%
Eclampsia	8	7.7%
Others/Unspecified	58	55.8%
Total	104	100%

Table 4
Causes of Postpartum Hemorrhage

Cause	Frequency (n)	Percentage (%)
Atonic Uterus	73	70.2%
Trauma (Lacerations, etc.)	20	19.2%
Retained Products (RPOC)	11	10.6%
Total	104	100%

Table 5
Management Strategies for PPH (N=104)

Management Type	Frequency (n)	Percentage (%)
Medical Management	60	57.7%
Surgical Intervention	44	42.3%
Total	104	100%

DISCUSSION

Postpartum hemorrhage (PPH) has become a major cause of maternal morbidity and mortality, especially in lower and medium-oriented countries like Pakistan. The purpose of this study was to evaluate the characteristics, causes, risk factors and management strategies of PPH among patients in JPMC, Karachi over a period of one year. These findings highlight the important aspects of PPH that are important for guiding clinical practice and improving maternal outcomes. Postpartum Hemorrhage is responsible for about 25% of maternal deaths globally, with the figure growing up to 60% in some developing countries [12, 13]. In Pakistan, the prevalence of PPH reported to be 34% [14].

The study found that the most affected age group was 21-30 years old, accounting for 46.2% of cases. This finding corresponds to previous research, indicating that the highest reproductive activity and as a result, this age group has the highest maternity risk [15]. Although young maternal age is often associated with better physical health, it does not necessarily provide immunity to obstetric complications, especially in settings where delivery care is limited or insufficient.

An important finding was the predominance of primary PPH, which seen in 92.3% of cases, only 7.7% compared to secondary PPH. It aligns with the global trend, where the primary PPH -prince defined as excessive bleeding within the first 24 hours after the first PPH -prince - is more common and often more severe than its secondary equivalent. This underlines the need for monitoring vigilance in the immediate postpartum period. These findings resemble the earlier study results [16].

Among the relevant risk factors, anemia emerged as the most prevalent, identified in 25% of cases. Anemia, often due to poor nutrition and inadequate delivery prenatal care, compromises the body's ability to tolerate blood loss and is a famous contribution to adverse maternal consequences. For a prolong labor and eclampsia were important contributors. In these conditions, not only the risk of uterine atony and trauma increased, but also the delivery is complicated, requiring timely intervention. An earlier study reported that patients identified as being at risk to develop PPH should be referred to health facilities equipped with skilled medical personnel and accessible blood bank services [17].

The present study found that an atonic uterus was a major cause of heavy PPH, accounting for 70.2% of cases. This finding corresponds to global literature, which identifies the uterine atney as the primary etiology of PPH due to the failure of the post-uterus muscles [18, 19]. Trauma causes, such as uterine rupture, contributed to 19.2% of cases, while the products of conception maintained (RPOC) identified in 10.6%. These findings highlight the importance of PPH's multicolored nature and completely delivery examination to identify and manage such causes. Another study identified several contributing factors to postpartum hemorrhage, including uterine atony, lower genital tract lacerations, retained placental tissue, uterine rupture, and uterine inversion. Among these, uterine atony emerged as the most common cause, with a frequency of approximately 57.6%. This is slightly lower than the findings of another study, which reported uterine atony as the cause in up to 80% of primary PPH cases [20, 21]. A previous study reported a similar incidence of uterine atony at 58%, closely aligning with our results [22].

Management strategies showed that most patients (57.7%) medically managed, mainly with uterus and auxiliary therapy. However, a sufficient ratio (42.3%) requires surgical intervention, including processes such as uterine artery ligation or hysterctomy. The relatively high rate of surgical management indicates the severity of bleeding in the notable number of cases and potentially delayed in referral or diagnosis, especially in unnatural or referenced patients. Similar findings reported in an earlier study [23].

This study also shows systemic challenges such as insufficient delivery prenatal care, delayed presentation, and inadequate features at peripheral centers that contribute to complications such as PPH. To address these issues, the referral system, community education and comprehensive emergency obstetric care needs to reinforce. Overall, the findings of this study strengthen the initial identity of risk factors, active management of the third phase of labor and the importance of quick intervention in PPH cases. Standardized protocols, staff training and resource availability are important to reduce the burden of PPH and improve maternal health results.

CONCLUSION

The present study found that uterine atney has been the main cause of postpartum hemorrhage (PPH), followed by trauma related injuries and retained conception of products. The findings confirm that PPH remains a major obstetric emergency, with the highest phenomenon among women between the ages of 21-30. Anemia as common risk factors, identifying prolonged labor and high blood pressure disorders, emphasizes the need for strong delivery care and timely obstetric intervention. Effective prevention, early diagnosis, and suitable management protocols suitable for these reasons are necessary to reduce the burden of PPH and improve maternal results in tertiary care settings such as JPMC.

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