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# Outcomes of Postpartum Haemorrhage among Women admitted at ICU in a Tertiary Care Centre in Bangladesh

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## Abstract

**Background:** Postpartum Haemorrhage (PPH) is one of the leading causes of global maternal mortality. It requires multidisciplinary approach for early recognition, intervention and prevention. **Objective:** The aim of the study was to evaluate the incidence, intervention, and outcome of patients with PPH admitted to the ICU. **Methods:** This retrospective observational study was conducted in the multidisciplinary ICU of Enam Medical College and Hospital, Savar, Dhaka, Bangladesh from January 2018 to December 2019. All the patients with PPH who were admitted to the ICU were the study population. Data about primary admission or referral case, mode of delivery, condition on admission, causes of admission, intervention, duration of ICU stay, and the outcome were collected and analyzed. **Results:** Total 1986 patients were admitted to ICU during the study period. Among them, obstetric patients were 152(7.65%).Total 39 (25.65%) cases were identified as PPH. Their mean age was27.23±4.98 years. 82.05%patients were referred from other hospitals and 17.94% primarily admitted to this hospital. 66% undergone vaginal delivery whereas 34% undergone cesarean section. Causes of admission were due to placental abnormalities (23.07%), followed by retained placenta (20.51%), genital tract trauma (17.94%), grand multipara (12.82%), uterine atony (12.82%), ruptured uterus (7.69%) and fibroid uterus (5.12%).Most of the patients presented with tachycardia, SOB, severe anaemia, shock or hypotension, desaturation, poor GCS and fluid overload. Regarding intervention, 64.1% patients received oxygen supplementation, 35.89% patients received mechanical ventilation, 94.87% patients received blood and blood products, 69.23% cases received inotropes, 35.89% received uterine tamponade, 82.05% cases received uterotonics, 33.33% cases received antifibrinolytics, bimanual uterine compression was given for 48.71% cases, uterine blood clot was removed for 43.58% cases, repair of genital tract tear was done for 17.94% cases, uterine artery ligation was done for 7.69% cases, arterial blood gas analysis and central venous cannulation was done was done for all the patients. Hysterectomy was conducted for 23.07% cases. The mean duration of ICU stay was 2.23 ±1.61 days and maternal mortality was 20.51%. **Conclusion:** PPH is one of the most common causes of obstetric ICU admission which requires multidisciplinary approach. *[Journal of National Institute of Neurosciences Bangladesh, January 2022;8(1): 79-83]*

**Keywords:** Intensive care; critical patients; postpartum haemorrhage; PPH; critical care

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## Introduction

Worldwide postpartum haemorrhage (PPH) is one of the major causes of maternal death[1-2]. According to WHO, it has been defined as bleeding per vagina of more than

500 mL following vaginal delivery within 24 hours[3] or an estimated blood loss more than 1000 mL and 1500 mL after Cesarean Section and Cesarean hysterectomy respectively[4]. It has been classified as primary PPH which occurs within 24 hours after delivery and secondary PPH which occurs up to 6 weeks following delivery[5]. Many risk factors have been identified for PPH including advanced maternal age, grand multipara, placental mal-implantation like praevia, accreta, increta or percreta, uterine atony, genital tract trauma or coagulopathy and emergency caesarean section[6,7,8].

Haemodynamically unstable PPH patients are usually shifted to ICU for resuscitation and continuous monitoring, to prevent organ failure. Management of these patients with haemorrhagic shock is very challenging for both obstetrician, Anaesthesiologists and intensivist especially in low resource settings. Measures taken in ICU includes: respiratory support, correction of haemodynamic instability, necessary medications, surgical interventions, and intense monitoring. The aim of management in ICU is to ensure adequate oxygenation and tissue perfusion[9]. PPH can lead to wide range of complications if not managed rapidly and efficiently. A large amount of blood loss leads to poor perfusion of vital organs resulting in multi-organ failure[10,11]. Approximately 54-93% of maternal deaths related to obstetric hemorrhage are preventable[12,13]. The aim of the study was to evaluate the incidence, intervention, and outcome of patients with PPH admitted to the ICU.

## Methodology

This retrospective observational study was conducted in the multidisciplinary ICU of Enam Medical College and Hospital, Savar, Dhaka, Bangladesh from January 2018 to December 2019. This hospital was a 1000 bedded teaching hospital with a multidisciplinary management facilities with 17-bedded ICU and had been managed by a team of two consultants, five residents, one associate professor, one professor and attending consultants from other departments. The nurse and patient ratio was 1:2. It had provided services to many critically ill patients in this area, often referred from surrounding districts also. After obtaining institutional approval, case records of patients with PPH admitted to the ICU were retrieved. Patients of non-obstetric per-vaginal bleeding were excluded from the study. Demographic data, mode of delivery, type of admission, Primary causes of PPH, condition at admission, intervention, duration of ICU stay and outcome were collected. SPSS version 20 for windows was used for statistical analysis.

## Results

A total number of 1850 patients were admitted to ICU during the study period. Among them obstetric patients were 175 (9.45%). Among these175 patients, 39 (22.2%) were identified with PPH. Majority (74.35%) of them were in between 20 to 30 years of age followed by 23.07% falls into the age group between 31-40 years. Only 2.56% were above 40 years of age [Table I].The mean age of the patients was 27.23±4.98 years (Table 1).

Table 1: Age distribution of the patients

| Age Group | Frequency | Percent |
|---|---|---|
| 20 to 30 Years | 29 | 74.3 |
| 31 to 40 Years | 9 | 23.1 |
| More than 40 Years | 1 | 2.6 |
| **Total** | **39** | **100.0** |

Majority of the patients were referred from outside hospitals 32 (82.05%) cases and only 7(17.9%) cases had primary admission to our hospital (Figure I).

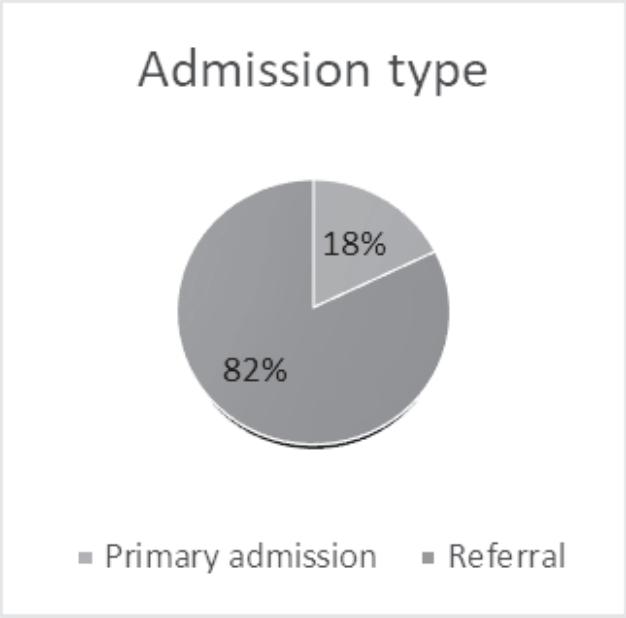


Figure I: Types of Admission

Regarding mode of delivery, 25(66%) patients undergone vaginal delivery whereas 13(34%) patients undergone cesarean section (Figure II).

Amongst the primary causes of PPH, majority were due to placental abnormalities 9 (23.07%), followed by retained placenta 8 (20.51%), genital tract trauma 7 (17.94%), uterine atony 6 (15.38%), grand multipara 4 (10.25%), ruptured uterus 3 (7.69%) and fibroid uterus 2 (5.12%) (Figure 2).

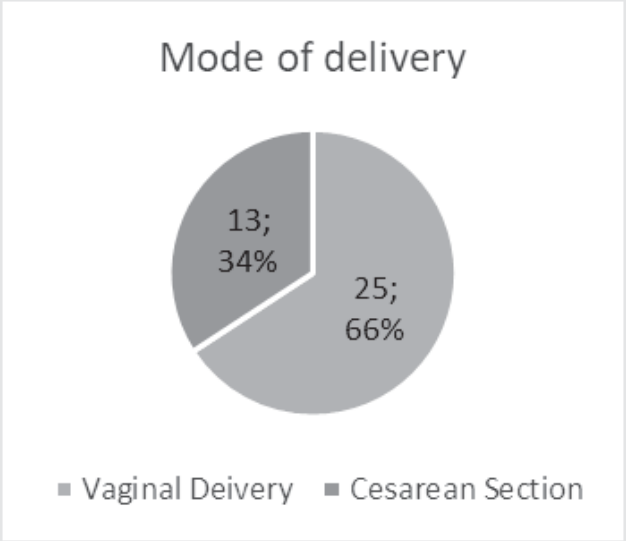


Figure I: Types of Admission

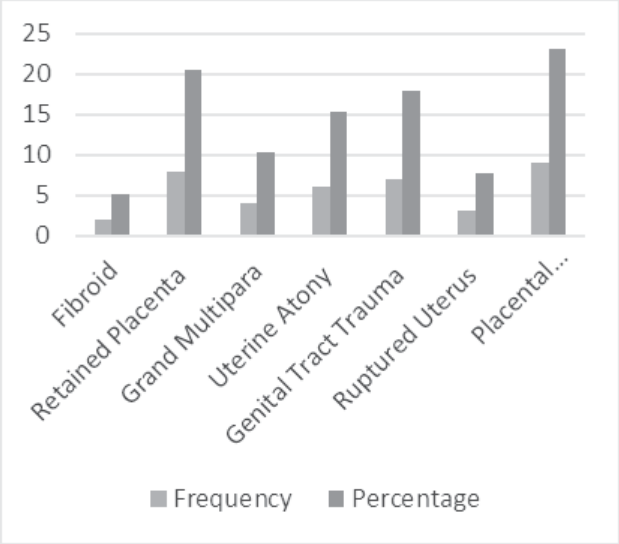


Figure II: Primary causes of PPH

Majority of the patients presented with tachycardia which was 32(82.05%) cases followed by SOB 31(79.48%) cases, severe anaemia 28 (71.79%) cases, shock or hypotension 27(69.23%) cases, desaturation 26(66.66%) cases, poor GCS 13(33.33%) cases and fluid overload 6(15.38%) cases (Table 2).

The resuscitative measures taken to manage the patients are listed in Table IV.25 (64.10%) received oxygen supplementation, 14(35.89%) received mechanical ventilation, 37(94.87%) received blood and blood products, 69.23% received Inotropes, 32(82.05%) received uterotonics, 13(33.33%) received antifibrinolytics, bimanual uterine compression was done for 19 (48.71%), uterine blood clot was removed from 17 (43.58%), 14 (35.89%) received uterine temponade (Sayba's method), repair of genital tract tear was done for 7 (17.94%), uterine artery was ligated for 3(7.69%) cases, arterial blood gas analysis and central venous cannulation was done for 39(100.0%) of patients and hysterectomy was conducted for 9(23.07%) patients (Table 3).

Table 2: Condition at admission

| Parameters observed | Frequency | Percent |
|---|---|---|
| Severe Anaemia | 28 | 71.8 |
| Desaturation | 26 | 66.7 |
| Tachycardia | 32 | 82.1 |
| Hypotension/ Shock | 27 | 69.2 |
| SOB | 31 | 79.5 |
| GCS: ≤ 8 | 13 | 33.3 |
| Fluid overload | 6 | 15.4 |

Table 3: Resuscitative Measures

| Intervention | Frequency | Percent |
|---|---|---|
| Oxygen supplementation | 25 | 64.1 |
| Arterial Blood gas analysis | 39 | 100.0 |
| Mechanical ventilation | 14 | 35.9 |
| Blood and Blood products | 37 | 94.9 |
| Inotropes | 27 | 69.2 |
| Central venous cannulation | 39 | 100.0 |
| Uterotonics | 32 | 82.1 |
| Antifibrinolytics | 13 | 33.3 |
| Bimanual uterine compression | 19 | 48.7 |
| Removal of uterine blood clot | 17 | 43.6 |
| Sayeba's method/ Uterine Temponade | 14 | 35.9 |
| Repair of genital tract tear | 7 | 17.9 |
| Uterine artery ligation | 3 | 7.7 |
| Hysterectomy | 9 | 23.1 |

Majority (69.23%) of the patients stayed in the ICU for 2-3 days, followed by 23.07% stayed for 4-5 days. Shortest duration was 1 day and the highest duration was 10 days. The mean duration of ICU stay was 2.23±1.61 days (Table 4).

Table 4: Duration of ICU stay

| Duration of stay (days) | Frequency | Percent |
|---|---|---|
| <2 | 1 | 2.6 |
| 2-3 | 27 | 69.2 |
| 4-5 | 9 | 23.1 |
| >5 | 2 | 5.1 |
| **Total** | **39** | **100.0** |

About 31(79.48%) patients survived after PPH whereas, 8(20.51%) did not survived (Table 5).

Table 5: Outcomes of the PPH Patients

| Outcome | Frequency | Percent |
|---|---|---|
| Survivor | 31 | 79.5 |
| Non survivor | 8 | 20.5 |
| **Total** | **39** | **100.0** |

## Discussion

Intensive care unit is a special section in the hospital which is designed to offer comprehensive care to critically ill patients with a focus to resuscitate and stabilize patients' haemodynamic abnormalities in order to prevent organ failure[9,14-15]. Obstetric haemorrhage is the leading cause of maternal mortality and PPH accounts for two-thirds of cases of obstetric haemorrhage and nearly one-quarter of all maternal mortality worldwide[8]. In our study obstetric cases were 9.45% of total ICU admission among which cases of PPH were22.2% whereas it was 28% in Bahadur et al[16], 37.2% in Lataifeh et al[17] and 13.5% in Farzi et al[18]. The mean age of these patients was 27.23±4.98 years which is comparable to the study of Uzundere et al[6] (28.9±6.68 years) and Krishna et al[2] (27±4 years).82.05% of our patients were referred from outside hospitals which is contrary to Rasooli et al[19] (20.68%).

The most common cause of PPH is uterine atony which constitutes to about 70-80% of PPH cases[20]. Diminished uterine tone and decreased contraction of the myometrium reduces compression of the blood vessels supplying to the placental thus increasing postpartum blood loss[20]. We found 15.38% were due to uterine atony which is lower than that of Lataifeh et al[17] (37.5%) and higher than that of Bhatt et al[21] (12.3%). Retained placenta is another cause of PPH. Risk factors for retained placenta are abnormal placentation in the uterus such as placenta accreta, abnormal placental formation etc. PPH also caused by trauma such as laceration of vulva, vagina, cervix and uterus and trauma may occur during normal vaginal delivery[9]. In this study 20.51% was due to retained placenta and 17.94% was due to genital tract trauma whereas in Verma et al.[22] it was 1.31% and 6.57% respectively. Other causes of PPH are abnormal placental position and ruptured uterus. In this study 23.07% were due to placental abnormalities and 7.69% due to ruptured uterus whereas in the study of Uzundere et al[6] it was 8.02% and 16.57% respectively.

Regarding the condition of the patients at admission, majority of the patients presented with tachycardia, shock, hypotension, severe anaemia, and respiratory distress, and poor GCS etc. Hence, multi-disciplinary approach is essential to manage PPH. Emergency surgical intervention, administration of uterotonics and or haemostatic agents and rapid supply and replacement of necessary blood and blood products are important steps in treatment[23]. The WHO stated that, the use of oxytocin should be the first choice in the third stage of labor to prevent PPH in all women giving birth[24]. In this study, all the patients received oxygen supplementation, central venous cannulation, and arterial blood gas analysis. About 69.23% cases received inotropes, 82.05% cases received uterotonics, 33.33% cases received antifibrinolytics, 48.71% cases received bimanual uterine compression, 35.89% patients received mechanical ventilation. In addition to the treatments mentioned above, transfusion of blood and blood products in patients with PPH is one of the most substantial steps of treatment. In this study, 94.87% cases received infusion of blood and blood products. Uterine artery ligation was done for 7.69% cases which is less comparable to Krishna et al[2] (53.33%) and 23.07% of these patients undergone hysterectomy whereas it was 73.33% in Krishna et al[2] and 50% cases in Lataifeh et al[6].

Majority (69.23%) of the patients stayed in the ICU for 2-3 days, followed by 23.07% stayed for 4-5 days. Shortest duration was 1 day and the highest duration was 9 days. The mean duration of ICU stay was 2.23 ±1.61 days which is comparable to the study of Uzundere et al[6] (1.88±1.01 days).In low income countries, PPH is a leading cause of maternal mortality representing 27.1% maternal deaths[25,26]. In this study maternal mortality was 20.51% which is much higher than Krishna et al.[2](13.33%).

## Conclusion

The care of acutely ill PPH patients in the ICU is challenging and often requires a multidisciplinary team approach. It is vital to have written protocols for the departments for proper interdisciplinary care. Early recognition and prompt management of these patients is essential to prevent maternal morbidity and mortality.

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