Post-Partum Hemorrhage- What is the Vital Back up in a Government Tertiary Care Institution

Authors
Dr Divya Yadav¹ Prof. Shikha Singh², Dr Rekha Rani³, Dr Ragini Singh⁴
¹Assistant Professor, Department of Obstetrics & Gynaecology, Sarojini Naidu Medical College Agra, UP
²Professor, Department Of Obstetrics & Gynaecology, Sarojini Naidu Medical College Agra, UP
³Associate Professor, Department of Obstetrics & Gynaecology, Sarojini Naidu Medical College Agra, UP
⁴Junior Resident, Department of Obstetrics & Gynaecology, Sarojini Naidu Medical College Agra, UP, India

Introduction
Severe Obstetric hemorrhage is the most dreaded obstetric emergency. The most common type of obstetric hemorrhage is post-partum hemorrhage (PPH). PPH remains a foremost cause of maternal mortality and morbidity worldwide. PPH occurs in 5% of all deliveries, majorities of death occur within four hours of delivery indicating that it is a consequence of the third stage of labour[⁴]. Further, it’s a major challenge in developing countries with a projected mortality rate of 140,000 annually or one death every four minutes[⁵]. WHO estimates 5,29,000 maternal deaths every year, India contributes to 25.7% of worldwide maternal mortality (1,36,000 maternal deaths/year). Two third of these maternal deaths occur post-delivery, PPH is the most frequently stated complication[⁶] and occurs generally without any warning signs or symptoms and commonly not associated with predisposing factors. The common causes of PPH are uterine atony, retained placenta, and trauma. Placental Anomalies, Abruptio placentae, and uterine rupture are less common but frequently accountable for severe PPH with acquired coagulopathy. The inadmissibly high maternal mortality of 540 per 100,000 live births in India in past decades remains a major challenge[⁷]. Most of the time, these deaths due to obstetric hemorrhage are preventable[⁸,⁹]. An understanding of the size of the problem, associated risk factors and consequence of PPH would help to improve both preventive and curative healthcare services. This retrospective cohort study is intended to identify the prevalence, associated risk factors and outcomes of various treatment strategies to manage PPH in an Indian tertiary Healthcare Centre.

Study Design & Methods
This retrospective observational study was conducted in the department of Obstetrics and Gynaecology, S.N. Medical college Agra to observe the causes of PPH, medical interventions and their outcome in patients delivered in our institution and those referred from outside. All cases of primary PPH whether delivered in our institution and referred from outside over one year period (from November’2015 to November’2016) were included in the study. Inclusion criteria of
10% decrease in haematocrit and deterioration of general condition (especially hemodynamic parameters) were taken into account to define patient of PPH. Their detailed history, clinical examination findings, management details, and outcomes related data were collected.

**Results**

The atonic uterus is observed to be the most common cause of PPH (60%) followed by Genital Tract Trauma (23%). Placental abnormalities account for only 16% of the PPH and coagulopathies even rarely (1%) contributes to PPH. (Figure-3)

Majority of the PPH cases (60%) managed with Medical Interventions (Medicine, fundal Massage, and supportive therapy) rest required surgical interventions. Out of 155 patients with PPH who needed an invasive procedure/surgical intervention, a good number of patients were managed with simple interventions like Balloon Tamponade (30%), Repair of cervical & Vaginal tears (34%), Removal of Placenta & its Bits (25%) and more than 50% of the patients required Compression Sutures and Uterine & Ovarian artery ligation. Rarely patients needed Internal Iliac ligation (7 patients; 5%) and Hysterectomy (11 patients; 7%). ICU admission also needed for only a minority of patients and most of the patients survived in ICU (only 3 deaths). (Table-1)

Morbidly adherent placenta observed as the most common cause (63%) among patients who needed a hysterectomy. (Table-2) Most common cause of PPH associated with mortality was Morbidly Adherent Placenta (65%) as well. (Figure-5)

Maternal mortality was higher in referred patients as most of the patients (7 out of 9 who died) presented with severe shock. (Figure-4)
### Table-1: Distribution of cases based on Management of PPH (n=386)

| Intervention                                                                 | Number of patients (%) |
|------------------------------------------------------------------------------|------------------------|
| **A. MEDICAL MANAGEMENT**                                                   | **261 (60%)**          |
| (Medical Rx + Fundal Massage)                                               |                        |
| **B. SURGICAL MANAGEMENT**                                                  | **155 (40%)**          |
| • Repair of cervical & Vaginal tears                                        | 53 (34%)               |
| • Balloon Tamponade                                                         | 46 (30%)               |
| • Removal of Placenta & its Bits                                            | 38 (25%)               |
| • Compression Sutures                                                       | 91 (60%)               |
| • Uterine & Ovarian artery ligation                                          | 76 (50%)               |
| • Internal Iliac ligation                                                   | 7 (5%)                 |
| • Repair of Uterine rent in a Post-Partum uterine rupture in case of VBAC    | 1 (0.6%)               |
| • Hysterectomy                                                              | 11 (7%)                |
| **C. Number of ICU Admissions**                                             |                        |
|                                                                             | 14 (3.6%)              |
|                                                                             | 11 (Survived)          |
|                                                                             | 3 (Died)               |
Table-2: Indications of Hysterectomies in PPH (n=11)

| Indication                  | Number of Patients (%) | Details                                                                 |
|-----------------------------|------------------------|-------------------------------------------------------------------------|
| A. Morbidly Adherent Placenta | 7 (63%)                | 5 Patients with prev 1 LSCS; 2 Patients with prev 2 LSCS                |
| B. Atonicity                | 2 (18%)                | 1 - the failure of Balloon Tamponade; 1 - the failure of compression sutures |
| C. Placenta Praevia         | 2 (18%)                | Medical Rx, compression sutures and stepwise devascularisation tried |

Figure-4: Mortality- Referred vs In-house

Figure-5: Cause of PPH leading to Mortality (n=15)

Discussion

- Out of total 386 cases of PPH, 55% are referred and 45% are In-house, though it seems PPH is less prevalent in patients delivered in our tertiary care center but it’s difficult to comment on based on that as might be only cases complicated with PPH usually referred to higher centers. Similarly, it would be inappropriate to conclude that PPH rates are higher in tertiary care center as mostly complicated pregnancies are dealt in tertiary centers, that can confound the results.
- Prevalence of PPH in our Institution was 8% which is accordance with WHO - 4-6%.\(^6\) According to recent data published in ACOG Bulletin\(^7\) Atonicity appears to be the most common cause of PPH (70-80%) in this study also atonicity stand out as the most common aetiology of PPH (60%).
- Maternal mortality in this study accounts to PPH is 23% which is in accordance with a
recently published Indian study (21%)\textsuperscript{[8]} and Morbidly Adherent Placenta identified as the most common cause of intractable PPH leading to hysterectomy and mortality.\textsuperscript{[9]}

- Above findings suggests that the management of PPH does not warrant a state of the art hospital facility. Whilst it requires awareness and correction of predisposing factors, like avoiding unnecessary cesaarean sections. The incidence of all types of placenta accreta is growing mostly associated with pregnancy with prior cesaarean deliveries.

- As most common aetiology is Atonic Uterus, prevention of uterine atony by the active and appropriate management of 3\textsuperscript{rd} stage of labour can avoid the most common cause of PPH. In post-delivery as well an appropriate ‘Golden Hour‘ management of PPH can prevent mortalities/severe shock as we can see in this study most of the maternal mortality in referred patients were due to severe shock who arrived 12 hours after it sets in.\textsuperscript{[10]}

- The morbidly adherent placenta should be anticipated and diagnosed beforehand in Women with the low-lying placenta and with previous cesaarean sections.

- Managing PPH with clinical judgement and timely medical and surgical interventions, Availability of PPH tray containing uterine ecbolics and necessary items for uterine and vaginal tamponade, compression sutures and vessel ligation besides the obstetric operating theatre, Appropriate laboratory, emergency USG facility and Adequate ICU back up along with trained and experienced paramedical staff can play a crucial role in saving mothers.

**Conclusion**

PPH is a major cause of maternal mortality attributing 23% of deaths in pregnancies in Indian perspective. Majority of the cases of PPH are preventable or manageable as atonic uterus and trauma of genital tract consist 83% of all cause of PPH. Morbidly Adherent Placenta is the most common cause of PPH associated with mortality and need of hysterectomy but fortunately its less common.

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