ECRONICON OPEN ACCESS

EC GYNAECOLOGY
Research Article

Primary Postpartum Hemorrhage in a Tertiary Hospital in the Middle East: A Two Years Review

Mahmoud Elmorsi Aboulfotouh[1,2]*, Huda Abdulla Saleh[1,3], Zeena Saeed Bushurbak[1], Naglaa Elsayed Hassan[1], Abdullah Awad Alibrahim[1], Fadi Mazen Elkhatib[1], Nadia Mustafa Almulla[1], Sunday Olubusola Amu[1] and Amira Shepl Saleh[3]

[1]*Obstetrics and Gynecology Department, Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar*

[2]*Obstetrics and Gynecology Department, Faculty of Medicine, Minia University, Minia, Egypt*

[3]*Quality and Patient Safety Department, Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar*

***Corresponding Author:** Mahmoud Elmorsi Aboulfotouh, Obstetrics and Gynecology Department, Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar.

Received: January 03, 2019; **Published:** January 21, 2019

Abstract

Objectives: To evaluate risk factors, causes, management and maternal outcomes of primary PPH.

Methods: This retrospective study was conducted at Women's Hospital, Hamad Medical Corporation, Doha, Qatar. 1640 women with primary PPH from November 1st 2015 till October 31st 2017 were included. Their electronic medical records were reviewed.

Results: The incidence of PPH in our study was 5.1%. 59.9% had Minor PPH, 26.3% had major PPH, while 13.8% had massive PPH. 44.3% had a BMI ≥ 30. There were identifiable risk factors for PPH in 67.9% of cases; the commonest were induction of labor (16%), diabetes with pregnancy (14.4%), macrosomia (7%), multiple pregnancy (6%) and placenta previa (5.6%). 59% of patients delivered vaginally, 19.6% had operative vaginal delivery, and 21.4% required cesarean section. The cause of PPH was atony in 45.8%, birth canal trauma in 32.9%, retained placenta in 4.9%, coagulopathy in 0.4%, and combined in 16%. 28.5% required blood/products transfusion. Hysterectomy was performed in 14 cases (0.9%). Only 7 patients (0.4%) required a re-laparotomy. There were no maternal mortalities in our study. 10% of cases required SICU admission.

Conclusion: Targeting these risk factors together may insure a dramatic decrement in PPH rate with its subsequent complications.

Keywords: *Postpartum Hemorrhage; Risk Factors; Outcome*

Introduction

Postpartum hemorrhage (PPH) is a life threatening condition and is a leading cause of maternal mortality. Although there are identifiable risk factors for PPH, it still can occur unpredictably and any pregnant woman after 20 weeks' gestation is at risk of developing PPH [1].

In conjunction with venous embolism and hypertension, PPH are the three leading causes of maternal mortality in developed countries. Some developing countries have maternal mortality rates in excess of 1000 women per 100,000 live births, and World Health Organization (WHO) statistics suggest that 60% of maternal deaths in developing countries are due to PPH, accounting for more than 100,000 maternal deaths per year [2].

Overall, 10.8% of women were estimated to suffer PPH but there appears to be a wide regional variation in PPH prevalence, ranging from 7.2% of women giving birth in Oceania, to 8% in Latin America and Asia respectively, with13% in Europe and Northern America, and up to 25.7% in Africa [3].

Women's Hospital is the largest tertiary referral center for the whole State of Qatar, with a throughput of 16,000 - 18,000 deliveries annually making it one of the biggest maternity hospitals in the Middle East. The aim of the present study was to evaluate risk factors, causes, management options and maternal outcomes of primary PPH in Women's Hospital.

Methodology

This retrospective study was conducted as a quality initiative at Women's Hospital, Hamad Medical Corporation, Doha, Qatar. It included 1640 women who experienced primary PPH whether following spontaneous vaginal delivery (SVD), operative vaginal delivery (OVD) or cesarean section (CS) during the period from November 1st, 2015 through October 31st 2017. There were 32605 deliveries in the unit during the study period. The electronic medical records of the included women were reviewed for demographic data, baseline clinical characteristics, associated medical co-morbidities, onset of labor whether spontaneous or induced, mode of delivery, cause of PPH, severity of PPH, medications used for control of PPH, blood products given, surgical interventions, SICU admissions and mortalities if any. Ethical approval was not required as this was a quality assurance project and all data were un-identifiable.

Definitions

According to local guideline CG10056; Prevention, early detection and management of postpartum hemorrhage, the following definitions were adopted:

- **PPH:** Abnormal bleeding after delivery that makes the patient symptomatic and/or results in signs of hypovolemia OR a total blood loss ≥ 500 ml after vaginal delivery (≥ 1000 ml blood loss after C-section).
- **Primary PPH:** Occurs within the first 24 hours after vaginal delivery or C-section.
- **Minor obstetric hemorrhage:** 500 ml - 1000 ml blood loss, with no evidence of clinical shock.
- **Major obstetric hemorrhage:** More than 1000 ml blood loss OR with evidence of clinical shock.
- **Massive obstetric hemorrhage:** Hemorrhage of more than 1500 ml estimation OR acute loss requiring transfusion of > 4 units of PRBC OR suspicion/evidence of DIC due to hemorrhage.

Statistical analysis was performed using the Statistical Package for Social Science (SPSS Inc., NY) version 21 for Microsoft Windows. Data was described in terms of mean ± SD (standard deviation) for continuous variables and frequencies (number of cases) and percentages for categorical data.

Results

The present study included 1640 women with primary PPH. The total number of deliveries in the study period was 32065. The incidence of PPH in our study is 5.1%. Minor PPH occurred in 59.9% of the cases (983/1640), 26.3% had major PPH (430/1640), while 13.8% had massive PPH (227/1640) (Table 1).

	N (%) (Total = 1640)
Minor PPH	983 (59.9%)
Major PPH	430 (26.3%)
Massive PPH	227 (13.8%)

Table 1: *Severity of PPH.*

The baseline clinical characteristics of the included patients are shown in table 2. 56.7% of patients had a BMI < 30, 34.6% had a BMI between 30 - 40, while only 8.7% had a BMI of ≥ 40 (Table 2).

	Total = 1640
Age (years); mean ± SD (range)	32 ± 0.7 (17 - 45)
Parity; mean ± SD (range)	1.85 ± 0.3 (0 - 14)
BMI (N, %)	
< 30	930 (56.7%)
30 - < 40	567 (34.6%)
≥ 40	143 (8.7%)
Gestational age (weeks); mean ± SD (range)	37.6 ± 0.4 (27 - 43)

Table 2: *Baseline clinical characteristics.*

There were identifiable risk factors for PPH in 67.9% (1115/1640) of cases. The most common risk factors were induction of labor (16%), DM with pregnancy (14.4%), macrosomia (7%), multiple pregnancy (6%) and placenta previa (5.6%). History of PPH was found in 2.1% of cases while hypertensive disorders were identified in 5.2% (Table 3).

	N (%) (Total = 1640)
Previous PPH	35 (2.1%)
Multiple pregnancy	99 (6%)
Polyhydramnios	25 (1.5%)
Big Baby	115 (7%)
Chorioamnionitis	18 (1.1%)
DM with pregnancy	236 (14.4%)
APH	28 (1.7%)
Placental Abruption	28 (1.7%)
Placenta Previa	92 (5.6%)
Bleeding Disorder	12 (0.7%)
Hypertensive disorders	85 (5.2%)
SROM>24%	25 (1.5%)
Precipitated labor	17 (1%)
Prolong 2nd Stage of Labor	37 (2.3%)
Induction of Labor	263 (16%)
Total	1115 (67.9%)

Table 3: *Risk factors.*

Delivery data of cases are shown in table 4. 59% of patient had spontaneous vaginal delivery, while 19.6% required operative vaginal delivery, and 21.4% delivered by cesarean section. 1.7% of the cases had a third degree perineal tear, while only 0.2% had a fourth degree perineal tear (Table 4).

	N (%) (Total = 1640)
Mode of delivery (N, %)	
SVD[1]	969 (59%)
OVD[2]	321 (19.6%)
CS[3]	350 (21.4%)
Episiotomy (N, %)	786 (47.9%)
OASI[4] (N, %)	
3rd degree	29 (1.7%)
4th degree	3 (0.2%)

Table 4: *Delivery data.*

1: SVD: Spontaneous Vaginal Delivery

2: OVD: Operative Vaginal Delivery

3: CS: Cesarean Section

4: OASI: Obstetric Anal Sphincter Injury.

Regarding the cause of PPH; uterine atony was found in 45.8%, trauma to the birth canal was found in 32.9%, 4.9% of cases had retained products of conception, 0.4% had coagulopathy, and the cause was combined in the remaining 16% of cases (Table 5).

	N (%) (Total = 1640)
Atonic	751 (45.8%)
Traumatic	540 (32.9%)
Retained products	81 (4.9%)
Coagulopathy	6 (0.4%)
Combined	262 (16%)

Table 5: *Causes of PPH.*

The details of management options are shown in table 6. 28.5% of patents required blood products transfusion. Bakri balloon was inserted in 3.3% of cases. 2% of patient had B Lynch compressing stitch. Peripartum hysterectomy was performed in 14 cases (0.9%). Only 7 patients (0.4%) required a re-laparotomy (Table 6).

	N (%) (Total = 1640)
Medications	
Oxytocin	1592 (97.1%)
Methergin	353 (21.5%)
Syntometrine	208 (12.7%)
Carboprost	337 (20.5%)
Carbetocin	80 (5%)
Misoprostol	726 (44.3%)
Tranexamic acid	121 (7.4%)
Blood transfusion	467 (28.5%)
Surgical interventions	
Episiotomy repair	786 (47.6%)
Repair of vaginal tears	34 (2%)
Repair of perineal tear	
1st degree	137 (8.4%)
2nd degree	182 (11.1%)
3rd degree	29 (1.7%)
4th degree	3 (0.2%)
Repair of cervical tear	42 (25.6%)
Evacuation of vulval/vaginal hematoma	13 (0.8%)
Vaginal packing	27 (1.6%)
Uterine packing	5 (0.3%)
Manual removal of placenta	15 (0.9%)
Bakri Balloon	54 (3.3%)
Uterine artery ligation	16 (1%)
Internal iliac artery ligation	7 (0.4%)
B-Lynch	32 (2%)
Hysterectomy	14 (0.9%)
Relaparotomy	7 (0.4%)
Others	70 (4.3%)

Table 6: *Management of PPH.*

There were no maternal mortalities in our study. 10% of cases required SICU admission (Table 7).

	N (%) (Total = 1640)
SICU admission	10 (0.6%)
Hysterectomy	14 (0.9%)
DIC	10 (0.6%)
Maternal mortality	0

Table 7: *Maternal outcome.*

Discussion

Blood loss of 500 ml following a delivery is generally considered as physiologically normal and anything above this limit is known as Post-partum hemorrhage [1]. However, Definitions of obstetrical hemorrhage vary, there is no definite agreement among authors, and in general, obstetrical hemorrhage is defined as loss of 500 mL of blood after vaginal birth or 1,000 mL after cesarean section. The visual estimate of the amount of bleeding is deemed unreliable and frequently underestimates the magnitude of the problem. Others have used reduced hemoglobin/hematocrit values to evaluate the amount of blood loss, but it is known that there is only a slight correlation of these values during the acute stage of the hemorrhage [4]and evaluate severe postpartum hemorrhage management.\\n\\nSTUDY DESIGN: The study population is a cohort of vaginal delivery and cesarean section patients with severe postpartum hemorrhage secondary to uterine atony. The study was designed as a descriptive, prospective, longitudinal, and multicenter study, during 10 months in 13 teaching hospitals.\\n\\nRESULTS: Total live births during the study period were 124,019 with 218 patients (0.17%. In our local guidelines, we adapt more clinically orient subdivision of PPH, not only including the blood loss, but the clinical picture of the patient as well as the need for blood components transfusion, that's not important only to give more targeted management, but also highlight the importance of how patient react differently to hemorrhage (i.e. evidence of shock in case of bleeding less the 1000 mls will but the patient in major PPH).

In economically developed and developing countries, post-partum hemorrhage is a leading cause of severe maternal morbidity and mortality. Approximately, 14 million women suffer postpartum hemorrhage annually [5]. In our population, the PPH rate of 5.1% is comparable to the international rate of 1 - 5% [6], in a unit of almost 18000 deliveries per year that's quite acceptable and indicating the efficiency of active management of third stage and proactivity in risk allocation of patients. So, this review mainly relates to these patients who either have no risk factors identified or have not responded to intervention measures applies to the perceived antenatal risks.

It is likely that the assessment of blood loss volume has been given too much emphasis: practitioners do not base their decision to treat solely on repeated formal blood loss estimates, but more on a clinical decision based on a variety of factors, including back- ground risk, rate of blood flow, practitioner personality, and availability of therapy, as well as the volume of blood lost. More research is required to understand this process, but a decision to treat based on the physiological response to blood loss, such as shock index (pulse/systolic blood pressure) or symptoms may be more appropriate [7].

Only about one-third of PPH cases have identifiable risk factors. These are believed to include: a history of prior PPH, nulliparity, overdistended uterus (e.g. caused by multiple gestations or a large baby), placental abnormalities; such as placenta previa or placenta accrete, coagulation abnormalities, anemia, induction of labor, augmentation of labor, or use of an epidural, and prolonged labor. In spite of speculation to the contrary, high multiparity does not appear to be a risk factor.

Taking that notion into account it reflects two important conclusions; first is the relative success in risk identification, hence prevention of PPH in the high risk group. The other conclusion is the unpredictability of PPH in the low risk group (about one thirds of our cases),

which lead to more controversy regarding the preventive measures (i.e. is it cost effective to generalize radical preventive measures as active management third stage, or in the contrary it might yield unnecessary burden on the resources and personnel).

There are no known risk factors to help predict which women will fail to respond to treatment with conventional uterotonics [8]. In our study it is shown that the great impact of high BMI in increasing the risk of PPH (about 43% of our patients had a BMI of > 30), diabetes (mainly GDM) is another considerable risk factor (up to 14.4% of the patients). Targeting those adjustable risk factors will significantly reduce the growing rate of PPH.

It is thought that most PPHs result from an atonic uterus, where the loss of myometrial tone allows maternal blood flow to the placental bed (500 ml/minute during pregnancy) to continue unchecked. Other causes include retained placental tissue, tears of the uterus, cervix, or vagina, and clotting disorders (the '4Ts' mnemonic: tone, tissue, trauma, and thrombin) (Week., *et al.* 2015). In our cohort of cases, uterine atony affected almost half of the patients and traumatic PPH in one third of them, we believe the reason behind this increment in traumatic PPH the is increase rate of 2nd stage cesarean section with its detrimental effect as well as the rate of operative delivery, this of course counteracted by the relative drop in atonic PPH contrary to the international figures [9,10] due to our strict adherence toward active management third stage and early detection of risk factors. The prophylactic administration of uterotonics has been shown to reduce the incidence of PPH through inducing uterine contractions [11].

The retrospective nature of the present study is definitely a limitation. However, its major strength is that it comes from a high volume tertiary unit, and it included a big cohort of patients that are difficult to be matched in such relatively short period.

Conclusion

The incidence of PPH in our study is comparable to international figures. Identifiable risk factors were found in 2/3 of cases. Targeting these risk factors together with strict adherence to management guidelines and protocols will insure a dramatic decrement in PPH rate with its subsequent complications.

Availability of Data and Materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request. All data generated or analyzed in the present study are included in this published manuscript.

Authors' Contribution

Conceptualization: HA Saleh, ME Aboulfotouh.

Data curation: ME Aboulfotouh, NE Hassan, FM Elkhatib, NM Almulla.

Formal analysis: AA Alibrahim, AS Saleh.

Methodology: HA Saleh, ME Aboulfotouh.

Project administration: HA Saleh, ZS Bushurbak.

Resources: NE Hassan, FM Elkhatib.

Software: AS Saleh, AA Alibrahim.

Supervision: HA Saleh, ZS Bushurbak, SO Amu.

Validation: AA Alibrahim, SO Amu.

Writing - original draft: ME Aboulfotouh.

Writing - review and editing: AA Alibrahim, SO Amu.

Ethics Approval and Consent to Participate

This study was a quality assurance project and data were kept unidentifiable, and hence ethical approval was not required. It was a retrospective study, so consent for participation was not applicable.

Consent for Publication

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

Bibliography

1. Edhi MM., *et al*. "Post partum hemorrhage: causes and management". *BMC Research Notes* 6 (2013): 236.
2. WHO. "Reducing the Global Burden: Postpartum Haemorrhage". Making Pregnancy Safer (2007).
3. Calvert C., *et al*. "Identifying Regional Variation in the Prevalence of Postpartum Haemorrhage: A Systematic Review and Meta-Analysis". *PLoS ONE* 7.7 (2012): e41114.
4. Montufar-Rueda C., *et al*. "Severe postpartum hemorrhage from uterine atony: A multicentric study*". Journal of Pregnancy* (2013): 525914.
5. Sosa CG., *et al*. "Risk factors for postpartum hemorrhage in vaginal deliveries in a Latin-American population". *Obstetrics and Gynecology* 113.6 (2009): 1313-1319.
6. Weisbrod AB., *et al*. "Emergent management of postpartum hemorrhage for the general and acute care surgeon". *World Journal of Emergency Surgery* 4 (2009): 43.
7. Pacagnella RC., *et al*. "A systematic review of the relationship between blood loss and clinical signs". *PLoS ONE* 8.3 (2013): e57594.
8. Sheldon WR., *et al*. "Postpartum haemorrhage management, risks, and maternal outcomes: findings from the World Health Organization Multicountry Survey on Maternal and Newborn Health". *BJOG: An International Journal of Obstetrics and Gynaecology* 121.1 (2014): 5-13.
9. Callaghan WM., *et al*. "Trends in postpartum hemorrhage: United States, 1994-2006". *American Journal of Obstetrics and Gynecology* 202.4 (2010): 353.e1-6.
10. Lutomski JE., *et al*. "Increasing trends in atonic postpartum haemorrhage in Ireland: an 11-year population-based cohort study". *BJOG: An International Journal of Obstetrics and Gynaecology* 119.3 (2012): 306-314.
11. Tuncalp O., *et al*. "Prostaglandins for preventing postpartum haemorrhage". *Cochrane Database of Systematic Reviews* 15 (2012): CD000494.

Volume 8 Issue 2 February 2019