Original Article

Frequency Of Primary Postpartum Hemorrhage in Tertiary Care Hospital, Hayatabad Medical Complex Peshawar: A Descriptive Cross Sectional Study

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Abstract

Background: Postpartum hemorrhage (PPH) is an obstetric emergency that causes almost 25% of deaths among pregnant ladies every year globally.

Objective: To determine the frequency of primary postpartum hemorrhage and its risk factors in Hayatabad Medical Complex Peshawar.

Methodology: It was a descriptive study that was held at Department of Gynecology& Obstetrics, Hayatabad Medical Complex, Peshawar, Pakistan which enrolled 162 patients through non-probability consecutive sampling. After informed consent, history was taken, and physical examination was done. Demographic details of all patients were documented. All female patients in spontaneous labour reporting in emergency with a single, alive, healthy, full term (≥ 37 weeks) pregnancy with parity up to 7 were enrolled. Patients who had blood loss more than 500 ml in spontaneous vaginal delivery (SVD) and ≥ 1000 ml in cesarean section were taken as postpartum hemorrhage. All the data was processed by SPSS v26.0. Quantitative variables were presented as mean ± SD. Qualitative variables were presented in terms of frequencies and percentages. Post-stratification, chi-square test was applied taking p-value ≤ 0.05 as significant.

Results: Mean age of patients with PPH was 31.44 ± 5.7years. PPH was seen in 32.1% (n=52) cases among enrolled patients (n=162). PPH when stratified for gestational age and maternal age showed insignificant p-value ≥ 0.05. PPH when stratified with mode of delivery showed significant difference with p-value of 0.018.

Conclusion: The study concluded that postpartum hemorrhage occurs with high frequency in the studied Pakistani population. Moreover, PPH is more common following spontaneous vaginal delivery and is associated with uterine atony, which remained the most frequent underlying cause

Key words: Frequency, Primary Postpartum Hemorrhage, Risk Factors, Tertiary Care Hospital.

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Introduction

Postpartum hemorrhage (PPH) is an obstetric emergency that accounts for nearly 25% of maternal deaths worldwide each year, particularly in Africa and Asia.[1] Women in low income countries have a higher risk of death (1 in 100) than in high-income countries (1 in 1000). The global prevalence of postpartum hemorrhage is reported at 6% with the

prevalence reported at 10.5% in Africa and 2.55% in Asia.[2] Postpartum hemorrhage is a major cause of maternal mortality accounting for 25% of all maternal deaths internationally.[3]

PPH is defined as a blood loss of ≥500 mL after vaginal birth or ≥1000 mL after caesarean birth within 24 hours. The blood loss in PPH is sufficient to cause hypovolemia resulting in more than a 10% fall in hematocrit occurring within 24 hours of birth or necessitating blood transfusion.[4] The common causes of postpartum hemorrhage are uterine atony, vaginal hematoma, genital tract injuries, retained or adherent placental tissue, coagulation abnormalities, uterine inversion and ruptured uterus.[5] Multiple risk factors for postpartum hemorrhage include past history of postpartum hemorrhage, uterine atony, grand multigravida, older maternal age, preterm births, genital tract injuries, lack of prophylactic oxytocin use, induced labour, intrauterine fetal death, cesarean section, placenta previa or accreta, coagulation abnormalities, anemia, prolonged labour and instrumental vaginal delivery.[6] Maternal morbidity and mortality associated with postpartum hemorrhage can be prevented if the condition is promptly identified and adequately managed. The complications associated with PPH include anemia, disseminated intravascular coagulation, hypovolemic shock, liver dysfunction, renal failure, blood transfusions, hysterectomy, acute respiratory distress and death.[7] A literature review revealed that frequency of primary postpartum hemorrhage was 18.60%.[3] The most common cause of primary PPH was uterine atony (57.6%), followed by genital tract tears (29.2%), retained placental tissue (10%), uterine rupture (3.6%) and uterine inversion (1.6%) respectively.[3] One researcher reported the prevalence of primary PPH to be 1.19% in Saudi Arabian women and 7.2% in Pakistani women.[8]

The rationale of present study is that postpartum hemorrhage is a major cause of maternal mortality in our country with considerable variability over the exact frequency and its association with risk factors in Pakistani population. In a developing country like Pakistan, it is the need of the hour to identify the women at risk of developing PPH through prompt identification of its causes. The current study was planned with the aim to determine the frequency of primary postpartum hemorrhage and its risk factors in Hayatabad Medical Complex Peshawar. The findings of this study will not only help in developing local evidence-based practices to decrease the burden of PPH but also in improving delivery settings for the prevention of PPH.

Methodology

It was a descriptive cross-sectional study conducted at the Department of Gynecology & Obstetrics, Hayatabad Medical Complex, Peshawar-Pakistan which enrolled 162 patients through non-probability consecutive sampling.[3] The duration of the study was six months following ethical approval. The sample size was calculated using the WHO sample size calculator for population proportion with specified absolute precision, taking a 95% confidence level, 6% absolute precision, and an anticipated population proportion of 18.6%.[3]

Ethical Consideration: After obtaining ethical approval (Reference No.: CPSP/REU/OBG-2016-021-7997, dated June 24, 2019), informed written consent was taken, and demographic parameters, including age, gravidity, parity, and duration of gestation, were docu-mented for all patients.

Inclusion criteria: A relevant clinical examination was performed, followed by necessary investigations and delivery. Labor and birth details were documented, including duration of labor; mode of delivery (spontaneous, instrumental, or cesarean section); placenta delivery time (complete or piecemeal), and estimated blood loss was calculated by counting the number of soaked pads since delivery. The amount of blood loss was recorded. Patients who had blood loss >500 mL in SVD and ≥1000 mL in cesarean section were classified as having postpartum hemorrhage. Active management of the third stage of labor was performed by an experienced gynecologist.

Exclusion criteria: Patients who had pregnancy associated with hypertension, diabetes, obesity, anemia, fever, chorioamnionitis, polyhydramnios, placenta previa, placenta accreta or placental abruption, ruptured uterus, uterine inversion, fetal congenital anomalies, preterm, intrauterine fetal death, twin pregnancies and secondary PPH were excluded from the study.

Statistical Analysis:

All data were processed using SPSS version 26.0. Nor-

mality of the data distribution was evaluated using the Shapiro–Wilk test to determine the suitability of parametric tests. Quantitative variables like maternal age, gravidity, parity, and gestational age were presented as mean ± standard deviation (SD). Qualitative variables like postpartum hemorrhage status, mode of delivery, and etiology of PPH were presented in terms of frequencies and percentages. Post-stratification, the chi-square test was applied, taking p-value ≤ 0.05 as statistically significant.

Results

Baseline parameters of all enrolled patients (n=162) in terms of age, gestational age, gravidity, parity, mode of delivery, PPH, and genital tract tear were presented as frequencies and percentages in Table I. The mean ± SD for age was 31.44 ± 5.7 years. PPH was seen in 32.1% (n=52) of the cases among the enrolled patients.

Table I: *Baseline Characteristics of the Enrolled Patients (n = 162)*

Parameters	Categories	Frequency (n)	Percentage (%)
Age (years)	18-25	36	22.2
	26-32	79	48.8
	33-40	47	29
	Mean ± SD (Years)	31.44 ± 5.7	
Gestational Age (weeks)	35-36.6	46	28.4
	37-39.9	71	43.8
	>40	45	27.8
	Mean ± SD (weeks)	32.44 ± 9.8	
Gravidity (weeks)	1-3	83	51.8
	4-6	79	48.8
	Mean ± SD	32.44 ± 9.8	
Parity	1 -2	58	35.8
	3-4	82	50.6
	>4	22	13.6
Mode of Delivery	SVD	76	46.9
	Cesarean Section	86	53.1
PPH	Yes	52	32.1
	No	110	67.9
Genital Tract tear	Yes	49	30.2
	No	113	69.8
Uterine atony	Yes	96	59.3
	No	66	40.7

Table II: *Stratification of Primary Postpartum Hemorrhage by Gestational Age Groups*

		Gestational Age			Total	P-value
		35-36+	37-39+	>40		
Primary Postpartum Hemorrhage	Yes	15	21	15	51	0.459
	No	31	51	29	111	
Total		46	72	44	162	
Stratification of Primary Postpartum Hemorrhage with Maternal Age groups						
Maternal Age (years)		18-25	26-32	33-40	Total	p-value
Primary Postpartum Hemorrhage	Yes	16	20	15	51	4.266
	No	20	60	31	111	
Total		36	80	46	162	

p value < 0.05 significant, p value calculated by Chi square test of association

Table III: *Primary Postpartum Hemorrhage stratification with Mode of Delivery*

		Mode of Delivery		Total	P-value
		Normal Vaginal Delivery	Cesarean Section		
Primary Postpartum Hemorrhage	Yes	24	27	51	0 .028*
	No	52	59	111	
Total		76	86	162	

*p value < 0.05 significant, p value calculated by Chi square test of association, *Statistically significant*

Post partum hemorrhage was stratified for gestational age, maternal age and mode of delivery as shown in Table-II. PPH when stratified for gestational age and maternal age that showed insignificant p-value ≥ 0.05.

PPH when stratified with mode of delivery showed significant difference with p-value of 0.028 as shown by Table-III.

Discussion

The effectiveness of a nation's health care system is reflected in maternal mortality or morbidity. Twenty five percent of maternal mortality worldwide and

sixty percent in some underdeveloped nations are caused 1 by postpartum hemorrhage. Prevalence of PPH in Pakistan has been documented as 34%.[5] In the present study, the frequency of PPH was 18.6%, which is lower than this earlier national estimate but higher than the 2.5% incidence reported in a tertiary hospital in Greece by Mitta et al.[9] Differences in study design, population characteristics, case definition and methods of blood-loss assessment may explain the variability in reported rates.

PPH has been reported to be less common in high-income settings, affecting roughly 2–11% of deliveries, but is more frequent and more deadly in many low and middle-income countries, including those in sub-Saharan Africa, where it accounts for around one-third of maternal deaths.[2,10] The majority of patients (74.8%) who experienced PPH in the current study were un-booked, meaning they had not used the prenatal health services and had not been evaluated for the possibility of developing PPH during birth. Globally, variations in prevalence reflect disparities in access to skilled birth attendants, facility-based deliveries, and Active Management of the Third Stage of Labor (AMTSL), all of which significantly influence outcomes. Recent WHO data reaffirms that the risk of maternal mortality due to PPH in low-income countries is almost tenfold higher than in high-income nations.[11] In such contexts, even moderate delays in diagnosis and response significantly increase morbidity and mortality.

In the present study, uterine atony and lower genital tract lacerations were found to be the primary causes of postpartum hemorrhage. This pattern is consistent with previous literature, which identifies atony as the leading cause of PPH and highlights genital tract trauma as another major contributor.[10,12] The incidence of uterine atony was 58% in one earlier study, which is comparable to our findings of 59.3%.[13] Uterine atony remains the leading cause of primary PPH globally. Oxytocin remains the standard uterotonic used during active management of the third stage of labor. However, in resource-limited settings where oxytocin storage or administration is a challenge, misoprostol or heat 15 stable carbetocin offer feasible alternatives as reflected in recent clinical studies in which oxytocin served as the comparator against carbetocin, including randomized trials of heat-stable carbetocin and dose-finding studies of carbetocin in caesarean delivery.[14,15] Recent Cochrane meta-analyses suggest that combination regimens such as ergometrine-oxytocin are more effective in reducing severe PPH than single-agent therapy, although implementation must consider side-effect profiles and storage feasibility.[16] Oxytocin-assisted active third-stage labor management lowers the incidence of PPH by 40%.[16] Because Misoprostol 800 micrograms per rectum is affordable and can be kept at room temperature, it can be used in place of injectable oxytocic medications for the prevention of PPH in home or basic health facility births.[16] Patients who are at risk of developing PPH should be referred to medical facilities with trained medical staff and blood banks. In 29.2% of cases in our study, lower genital tract injuries during delivery were discovered. Differences in the distribution of PPH etiologies, such as genital tract lacerations, have been reported across studies, and variations may be influenced by population characteristics, delivery practices, and gestational age, which is known to affect PPH risk.[17] According to a hospital-based study from Nigeria, 11.84% of PPH cases were attributed to tears of the vulva, perineum, vagina, cervix or uterus.[18] Genital tract trauma is recognized as a key contributor to hemorrhage in both vaginal and operative deliveries. Routine post-delivery inspection of the birth canal, particularly after instrumental birth or prolonged labor, is therefore essential. The RCOG Green-top Guideline No. 52 specifically emphasizes early recognition and skilled repair of perineal and genital tract trauma as part of effective PPH prevention and management.[18,19] Furthermore, supervised training and mannequin drills for junior residents performing instrumental deliveries can reduce iatrogenic injuries and improve patient outcomes. These results emphasize that for postgraduate trainee physicians to perform instrumental deliveries, appropriate supervision and training are required. The need for early recognition of bleeding cannot be over emphasized. Traditional visual estimation underestimates blood loss by up to

50%. WHO and ACOG now recommend using calibrated drapes and quantitative blood loss (QBL) protocols as standard practice.[14,19-20] Implementing QBL rather than relying on soaked pad counts, as used in this study, would provide more accurate diagnosis and timely intervention. Moreover, recent evidence from the E-MOTIVE trial has revolutionized early PPH care. This multicenter randomized trial showed that using a bundled approach including uterine massage, oxytocin, tranexamic acid (TXA), IV fluids, and early team escalation, reduced severe bleeding by 60%.[20,21] This highlights the importance of bundle-based management and structured team responses. TXA, in particular, has emerged as a first-line adjunctive therapy. The WOMAN trial demonstrated a significant reduction in maternal deaths due to bleeding when TXA was administered within 3 hours of birth.[21,22] Its incorporation into first-response kits in all labor rooms could be a cost-effective, high-impact intervention. There should be mannequin drills, and senior registrar-level physicians with the necessary skills should either perform instrumental deliveries themselves or allow junior physicians to do so under close super vision. Primary PPH is a potentially fatal obstetric emergency that raises Pakistan's rate of maternal morbidity and mortality. According to the current research, primary PPH is more common in our healthcare system than in the developed world.

Conclusion

Postpartum hemorrhage continues to be a major obstetric concern in Pakistan, with this study demonstrating a high frequency of PPH in the studied population. Uterine atony emerged as the most frequent underlying cause, followed by genital tract injuries, and PPH was found to be more common following spontaneous vaginal delivery. These findings underline the need for vigilant intrapartum monitoring and timely management to reduce preventable complications. Strengthening maternal healthcare services, ensuring early risk identification, and promoting adherence to evidence-based preventive measures remain essential to mitigating the burden of PPH and improving maternal outcomes.

Limitations and Recommendations

This study was conducted at a single tertiary care hospital, which may limit the generalizability of its findings to other settings, particularly rural or primary healthcare environments. The cross-sectional design restricts the ability to establish causal relationships between identified risk factors and the occurrence of postpartum hemorrhage. Additionally, the use of visual estimation and pad counts for assessing blood loss may have introduced measurement bias, potentially underestimating the actual prevalence of PPH. The exclusion of certain high-risk obstetric cases also limits the scope and applicability of the results.

To improve maternal outcomes and reduce the burden of PPH, early antenatal booking and regular follow-ups should be strongly encouraged. Training programs focused on emergency obstetric care and perineal repair must be implemented for clinical staff, particularly junior residents. Active management of the third stage of labor should be standardized in all delivery settings. Health facilities must adopt quantitative blood loss monitoring instead of subjective estimation methods and ensure the timely availability of uterotonics and tranexamic acid. Public health efforts should focus on educating communities about the importance of institutional deliveries, early recognition of danger signs, and seeking timely care. Strengthening referral systems and equipping healthcare system with essential resources are also vital to address life-threatening obstetric emergencies like PPH.

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Authors Contribution:

SA: Conceptualization of Project, Data collection and Revision

SMT: Data Collection, Statistical Analysis and Revision of manuscript.

SA: Literature Search, Drafting and Proof Reading.

SMA: Statistical Analysis, Data collection and Revision

AK: Drafting, Writing of manuscript and Revision.