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Frequency of Postpartum Hemorrhage in Multigravida

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ABSTRACT

Background: Postpartum hemorrhage remains a major cause of maternal morbidity and mortality across the world, predominantly in middle- and lower-income countries. Postpartum hemorrhage is significantly associated with high parity, higher maternal age, high body mass index, and mode of delivery. Estimation of its occurrence and predictors among multigravida is critical in allowing timely intervention and prevention efforts. **Objective:** To determine the frequency of postpartum hemorrhage in multigravida at Ayub Teaching Hospital Abbottabad. **Study Design:** Descriptive cross-sectional study. **Duration and Place of Study:** This study was carried out in the Department of Obstetrics and Gynaecology, Ayub Teaching Hospital, Abbottabad, from December 2024 to May 2025. **Methodology:** A total of 111 multigravida women aged 25–40 years with singleton pregnancies beyond 36 weeks were enrolled through consecutive sampling. Baseline information, including age, parity, gestational age, body mass index, residence, and socioeconomic status, was recorded. Deliveries were observed, and postpartum hemorrhage was defined as ≥500 mL blood loss after vaginal delivery or ≥1000 mL following cesarean section, measured by calibrated weighing of blood-soaked materials. **Results:** The mean maternal age was 31.08 ± 3.02 years, with a mean parity of 4.29 ± 1.24. The overall frequency of postpartum hemorrhage was 19.8% (22/111). Significant associations were observed with maternal age (p=0.025), parity (p=0.012), body mass index (p=0.004), and mode of delivery (p=0.012). **Conclusion:** Postpartum hemorrhage was found in nearly one-fifth of multigravida women, with advanced age, higher parity, elevated body mass index, and cesarean delivery being significant predictors.

INTRODUCTION

Multigravida is the term used for those who have experienced more than one pregnancy, regardless of the outcome of the pregnancy.[1] Compared to primigravida, the multigravida women are likely to have adapted uterine biology and less myometrial activity due to the repeated distension of the uterine wall in multiple pregnancies.[2] Such adaptations predispose them to obstetrical complications in labor and parturition.[3] Multigravida is also likely to be of advanced maternal age, higher parity, and comorbidity, all of which impact maternal and neonatal outcome.[4]

Multiple pregnancies not only alter uterine dynamics but also heighten the risk of complications during and after childbirth.[5] These women are more susceptible to uterine atony, placenta previa, and adherent placenta due to repeated implantation in the same uterine cavity.[6] Prolonged or obstructed labor, genital tract trauma, and retained placental fragments are more frequent in this group, and these conditions can significantly increase maternal morbidity.[7] Furthermore, complications such as anemia, infection, and delayed recovery are common in multigravida, especially when adequate antenatal care is lacking.[8]

One of the most severe threats among multigravida women is the occurrence of postpartum hemorrhage, a still-prevalent cause of maternal mortality across the world.[9] Uterine atony is the most common underlying mechanism since multiple pregnancies lessen the effectiveness of muscle contractions of the uterus following delivery.[10] Prevalence of postpartum hemorrhage among multigravida is thus increased in comparison with primigravida, generally in grand multiparity.[11] Prevention through active management of the third stage of labor, prudent application of uterotonic agents, and close observation in the postpartum period can minimize such a risk.[12] Early detection and immediate action are vital in enhancing maternal survival and the ultimate health outcome among this high-risk group.[13]

In a study conducted by Hussain SS et al., the frequency of postpartum hemorrhage among multigravida women was found to be 7.81%.[14]

Postpartum hemorrhage is a major cause of maternal mortality and morbidities in Pakistan, and it is variable at

the regional level based on access towards healthcare and maternal profile. Abbottabad is a key referring center of the rural areas, and it serves healthcare facilities for a large cohort of multigravida who are at a high-risk owing to the unavailability of antenatal services and delayed referring cases. There is a continuing shortage of published evidence from the region about the occurrence and outcome of postpartum hemorrhage in multigravida. It is thus essential to execute the study in Abbottabad in order to generate regional evidence, guide preventing measures, and strengthen maternal healthcare services in the region.

METHODOLOGY

This descriptive study was undertaken in the Department of Obstetrics and Gynaecology at Ayub Teaching Hospital, Abbottabad, over a six-month period from December 2024 to May 2025. A total of 111 participants were included. The sample size was estimated using the World Health Organization software, employing a 95% confidence interval and a 5% absolute precision, while considering an anticipated prevalence of postpartum hemorrhage in multigravida women at 7.81%.[14] Patients were enrolled through a non-probability consecutive sampling approach.

Approval for the study was granted by the institutional ethics review committee before initiation. Women between 25 and 40 years of age, carrying a singleton pregnancy beyond 36 weeks of gestation confirmed by last menstrual period, and with a history of at least two previous pregnancies, irrespective of their outcomes, were eligible for inclusion. Women with hypertension, prior induced abortions, bleeding disorders such as disseminated intravascular coagulation, aplastic anemia, or thrombocytopenia were excluded.

After obtaining informed written consent, baseline characteristics were documented at the time of admission, including age, parity, gestational age, body mass index, residential background, and socioeconomic level. A detailed obstetric history and examination were conducted, and participants were followed until delivery. The type of delivery was also recorded.

Postpartum hemorrhage was considered present if blood loss within 24 hours of delivery amounted to at least 500 milliliters after vaginal birth or 1000 milliliters following cesarean section. Blood loss was quantified by weighing soaked pads, gauzes, and clots, with weight differences translated into milliliters on the basis that one gram equaled one milliliter of blood.

Statistical analysis was performed using IBM SPSS version 26. Quantitative data such as age, parity, gestational age, and body mass index were expressed as mean with standard deviation or median with interquartile range, depending on distribution. Categorical data, including socioeconomic status, residential background, type of delivery, and occurrence of postpartum hemorrhage, were summarized as frequencies and percentages. Stratification was applied for potential confounders, including age, parity, gestational age, body mass index, socioeconomic status, residential background, and mode of delivery. Chi-square test or Fisher's exact test was used where appropriate, with a p-value of ≤0.05 considered statistically significant.

RESULTS

The study included 111 multigravida patients with a mean age of 31.08±3.02 years and mean gestational age of 39.02±1.16 weeks (as shown in Table-I). The mean parity was 4.29±1.24 and mean BMI was 26.09±2.57 kg/m^2. Regarding residence, 59 patients (53.2%) were from rural areas while 52 patients (46.8%) were from urban areas. Socioeconomic status distribution showed 55 patients (49.5%) were poor, 39 patients (35.1%) were middle class, and 17 patients (15.3%) were rich. Mode of delivery was nearly equally distributed with 57 patients (51.4%) having vaginal delivery and 54 patients (48.6%) undergoing cesarean section (as shown in Table 1).

Table 1

Patient Demographics

Demographics		Mean ± SD
Age (years)		31.08±3.02
Gestational Age (weeks)		39.02±1.16
Parity		4.29±1.24
BMI (kg/m^2)		26.09±2.57
Residence	Rural n (%)	59 (53.2%)
	Urban n (%)	52 (46.8%)
Socioeconomic Status	Poor n (%)	55 (49.5%)
	Middle n (%)	39 (35.1%)
	Rich n (%)	17 (15.3%)
Mode of Delivery	Vaginal Delivery n (%)	57 (51.4%)
	C-section n (%)	54 (48.6%)

The overall frequency of postpartum hemorrhage among the study population was 22 cases (19.80%) while 89 patients (80.20%) did not experience postpartum hemorrhage (as shown in Table 2).

Table 2

Frequency of Postpartum Hemorrhage Among Multigravida Patients (N=111)

Postpartum Hemorrhage	Frequency	% age
Yes	22	19.80%
No	89	80.20%
Total	111	100%

When examining associations with demographic factors, age showed a significant association with postpartum hemorrhage (p=0.025), where patients ≤30 years had 6 cases (11.1%) compared to 16 cases (28.1%) in patients >30 years (as shown in Table-III). Gestational age did not show significant association (p=0.189) with 11 cases (15.9%) in ≤39 weeks group and 11 cases (26.2%) in >39 weeks group. Parity demonstrated significant association (p=0.012) with 6 cases (10.5%) in ≤4 parity group versus 16 cases (29.6%) in >4 parity group. BMI showed highly significant association (p=0.004) with 4 cases (7.7%) in ≤25 kg/m^2 group compared to 18 cases (30.5%) in >25 kg/m^2 group. Residential status showed no significant association (p=0.533) with 13 cases (22.0%) in rural and 9 cases (17.3%) in urban populations. Socioeconomic status showed no significant association (p=0.947) with 11 cases (20.0%) in poor, 7 cases (17.9%) in middle, and 4 cases (23.5%) in rich categories. Mode of delivery demonstrated significant association (p=0.012) with 6 cases (10.5%) following vaginal delivery versus 16 cases (29.6%) following cesarean section (as shown in Table 3).

Table 3

Association of Postpartum Hemorrhage with Demographic Factors

Demographic Factors		Postpartum Hemorrhage		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	6 (11.1%)	48 (88.9%)	0.025
	>30	16 (28.1%)	41 (71.9%)	
Gestational Age (weeks)	≤39	11 (15.9%)	58 (84.1%)	0.189
	>39	11 (26.2%)	31 (73.8%)	
Parity	≤4	6 (10.5%)	51 (89.5%)	0.012
	>4	16 (29.6%)	38 (70.4%)	
BMI (Kg/m^2)	≤25	4 (7.7%)	48 (92.3%)	0.004*
	>25	18 (30.5%)	41 (69.5%)	
Residential Status	Rural	13 (22.0%)	46 (78.0%)	0.533
	Urban	9 (17.3%)	43 (82.7%)	
Socioeconomic Status	Poor	11 (20.0%)	44 (80.0%)	0.947*
	Middle	7 (17.9%)	32 (82.1%)	
	Rich	4 (23.5%)	13 (76.5%)	
Mode of Delivery	Vaginal Delivery	6 (10.5%)	51 (89.5%)	0.012
	C-section	16 (29.6%)	38 (70.4%)	

*Fischer Exact Test

DISCUSSION

The current study found a postpartum hemorrhage prevalence of 19.8% among multigravida patients, which illustrates the high clinical burden of the obstetric complication in multiparous women. The study found that a myriad of demographic and clinical factors are significantly linked with increased risk of postpartum hemorrhage, which offers useful information regarding risk stratification and prevention measures. The strong association of advanced maternal age (>30 years) with postpartum hemorrhage could be attributed to age-related anatomical and physiological changes such as diminished uterine muscle tone, diminished myometrial contractility, and weakened vascular integrity responsible for ineffective hemostasis after delivery. Increased parity (parity >4) served as a strong predictor of postpartum hemorrhage, which can be explained in terms of the gradual attenuation of uterine muscle fibers in multiple pregnancies, culminating in uterine atony and inefficient compression of spiral arteries after placental dissociation. Association of higher BMI (BMI >25 kg/m^2) values with increased hemorrhage risk is attributed to the effects of maternal fat infiltration upon the uterus, as increased fat infiltration in myometrial fibers is responsible for declining muscle efficiency and the duration of the third stage of labor, thus exposing the uterus to heightened hemostatic stress. Cesarean delivery had significantly increased hemorrhage rates in comparison with vaginal delivery, in accordance with the inherent surgical complications such as incisional bleeding, possibility of surgical manipulation-triggered uterine atony, and increased predisposition towards placental complications necessitating operative measures for resolution. Gestational age, residential status, and socioeconomic factors did not show strong associations with the outcome of postpartum hemorrhage, thus suggesting the primacy of biological and clinical factors over sociodemographic variables in determining hemorrhage risk in the context of multigravida patients.

Our study results demonstrated an overall postpartum hemorrhage frequency of 19.80% among 111 multigravida patients, which aligns closely with several previous investigations. This finding is remarkably similar to the 18.6% prevalence reported by Munir et al. [15] in their large cohort of 1,344 deliveries at Lady Willingdon Hospital, Lahore, and the 20.4% rate observed in the spontaneous labor group by Mubasher et al. [16] at Benazir Bhutto Hospital Rawalpindi. The consistency across these Pakistani studies suggests a relatively stable PPH prevalence pattern in the regional multigravida population, despite different study periods and methodologies.

Our findings regarding age-related PPH risk, where patients >30 years showed significantly higher rates (28.1% vs 11.1%, p=0.025), corroborate the age-related trends identified by Ali et al. [17] who found increased PPH risk with advancing maternal age (aOR 1.10, 95% CI 1.04-1.1). Similarly, Kebede et al. [18] demonstrated that maternal age ≥35 years was a strong predictor of PPH (AOR 6.8, 95% CI 3.6-16.0). This consistent age-related pattern across different populations suggests that advanced maternal age represents a universal risk factor for PPH, likely due to decreased uterine contractility and increased obstetric complications associated with aging.

The significant association between higher parity (>4) and increased PPH risk (29.6% vs 10.5%, p=0.012) in our study contrasts with some previous findings. While Majid et al. [19] reported that 32.18% of their PPH cases were grand-multiparous, and Munir et al. [15] found 56.8% of PPH cases occurred in para 3-4 women, the relationship between parity and PPH risk remains complex. Fenn et al. [20] noted that 42.7% of vaginal delivery PPH cases had parity ≥5, supporting our finding that grand multiparity increases PPH risk, possibly due to uterine overdistension and reduced contractile capacity in women with multiple previous pregnancies.

Our observation of significantly higher PPH rates following cesarean section compared to vaginal delivery (29.6% vs 10.5%, p=0.012) is strongly supported by Fenn et al. [20] who reported PPH rates of 13.0% after cesarean section versus 4.0% after vaginal delivery. This substantial difference can be attributed to the inherent surgical risks, altered uterine contractility following surgical manipulation, and the higher baseline blood loss associated with cesarean procedures. The mean blood loss of 1,400 mL in cesarean cases versus 860±498.5 mL in vaginal deliveries reported by Fenn et al. [20] further substantiates this relationship.

The highly significant association between BMI >25 kg/m^2 and PPH risk (30.5% vs 7.7%, p=0.004) in our study provides new insights, as this specific relationship was not extensively explored in the compared studies. Shah et al. [21] reported varying PPH rates across BMI categories (30% for BMI <19, 26% for BMI 19-24.9, 27% for BMI 25-29.9, and 25% for BMI >30), but without clear statistical significance testing. Our findings suggest that overweight and obese multigravida women may be at substantially higher risk for PPH, possibly due to increased operative interventions, prolonged labor, and mechanical factors affecting uterine contraction.

While our study focused on multigravida patients, the comparison with studies including primigravidas reveals interesting patterns. Shah et al. [21] and Hussain et al. [14]

specifically examined primigravidas and found PPH rates of 26.9% and 8% respectively, suggesting that parity status significantly influences PPH risk. Mubasher et al. [16] included 67% multigravida patients and reported higher PPH rates in induced labor (44.4% vs 20.4%), emphasizing the additional risk factor of labor induction that we did not specifically address in our study.

The geographical and healthcare system variations may explain some differences in PPH prevalence across studies. While Pakistani studies (including ours) generally report PPH rates between 18-27%, international studies like Fenn et al. [20] from Oman and Kebede et al. [18] from Ethiopia reported rates of 4-13% and 16.6% respectively. These variations likely reflect differences in healthcare infrastructure, antenatal care quality, and population characteristics, as highlighted by Ali et al. [18] who emphasized the importance of skilled birth attendance and adequate antenatal care in PPH prevention.

This study is limited in various ways and must be considered in the context in which it is used. As a single-center study in a single tertiary care hospital, the results may not be generalizable across the broad spectrum of healthcare institutions or populations having distinct demographic profiles. The sample size of 111 patients, although sufficient for statistical comparisons, reduces the ability to identify smaller effects and may fail to identify the entire continuum of risk factors for postpartum hemorrhage among multigravida women. It is not possible to establish causal associations of the observed risk factors and the development of PPH under the cross-sectional study design. Confounding variables such as labor induction techniques, labor duration, uterotonic agent use, or distinct obstetric maneuvers that could affect bleeding outcomes were not considered in the study. It is still considered a limitation that the study is based on clinical evaluation for the diagnosis of PPH in place of objective assessment of blood loss, as it would add variation in case detection and classification.

CONCLUSION

Our research concluded that postpartum hemorrhage is still a serious complication among multigravida patients, and that advanced maternal age, grand multiparity, high body mass index, and cesarean delivery are key risk factors. Results show that multigravida patients who are older than thirty years old and higher parity are at high risk of generating postpartum hemorrhage. It is also observed that patients who are either overweight/obese, as well as those who have a cesarean section, have a high rate of bleeding complications.

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