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Original Research Article

Prevalence and risk factors of postpartum hemorrhage among caesarean delivery cases at Popular Medical College

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ABSTRACT

Background: Postpartum hemorrhage (PPH) remains one of the leading causes of deaths in the world, which is a big challenge to obstetric care. Cesarean birth, though life-saving in nature. a lot of situations, is in a greater risk of hemorrhagic complications. This paper will seek to identify the incidence of postpartum bleeding and determine the risk factors of it in women undergoing caesarean. Popular Medical College delivery.
Methods: This is a cross-sectional study that was carried out in the Department of Obstetrics and Gynecology at Popular Medical College, Dhaka, Bangladesh from January 2024 to January 2025, 68 women who had caesarean delivery within the period of study. Analysis of the data was done in the SPSS version 25.0 by descriptive statistics.
Results: The prevalence of PPH was 20.6% in 68 caesarean births. Antenatal 42.6% of women had anemia and an anemic mom had a greater PPH. Placenta previa/accreta was present in 11.8% of incidences and exhibited the most significant association with PPH. Emergency caesarean section also. had an increased PPH rate. In total there was 16.2% blood transfusion among all women and in PPH cases, others had to be in the ICU and undergo surgery.
Conclusions: The research indicates that the prevalence of PPH among caesarean births at Popular medical is high (20.6%). College, with some of the main risk factors being antenatal anemia, placenta previa/accreta and emergency caesarean. Many the degree of PPH in this environment was such that affected women needed transfusion and critical care.

Keywords: Caesarean delivery, Placenta previa, Postpartum hemorrhage

INTRODUCTION

PPH is a major cause of maternal morbidity and mortality in the world today and almost a quarter of the causes a quarter of global maternal deaths and this creates a significant burden to the obstetric care systems especially in low-end countries. and middle-income countries.[1] Nevertheless, regardless of the development of obstetric services, PPH remains in the list of the primary preventable maternal deaths.

Prevention and early treatment of PPH, hence, are Areas of concern in maternal health at the global level in the first place. The WHO recommends that good prevention, early identification and competent intervention are the signifiers of decreasing the burden of postpartum hemorrhage in the vagina. birth and caesarean birth.[2] Caesarean delivery (CD) although saving lives in most cases is risky in itself profile as far as obstetric hemorrhage is concerned. In comparison, caesarean section has a higher intraoperative blood. pain in relation to vaginal birth, higher risk of uterine atony and postoperative difficulties that raise the chances of risk of PPH.

A number of good studies have established significant predictors of severe PPH after CD, such as but not limited to placenta previa, placenta accreta spectrum, several previous caesareans, perioperative anemia, extended pre-partum labor before intrapartum caesarean and surgical complication as a result of adhesions.[3] Such risk factors emphasize the relevance of standardized preoperative testing and focused approaches to the prevention of PPH

in high-risk women. The recent large cohort studies have helped to narrow down the knowledge on PPH risk in caesarean births. In a retrospective study of nearly 3,500 caesarean deliveries, maternal anemia, placental showed the same (2022). Among the most powerful predictors of hemorrhage are abnormalities, fetal macrosomia and emergency CD.[4] Besides, new predictive models that have been developed based on machine learning methods have proven. assert that it will be accurate in predicting personalized PPH risk before surgery, which justifies their possible use in preparedness in clinical decision-making and resources.[5] The PPH burden in the world is particularly severe in South Asian nations, one of which is Bangladesh.

According to the latest news of national health. surveys, hemorrhage is among the leading causes of maternal mortality in Bangladesh, which is normally aggravated by delay. in care seeking, low access to blood transfusion services and meager emergency obstetric care unit resources.[6] The need to know the trend of PPH relative to caesarean cases has gained significance in the recent past patient safety and quality improvement, in the context of increasing caesarean delivery rates in the country. In similar low the incidence of severe postpartum hemorrhage in the presence of resources settings after caesarean delivery has been reported to exceed high-resource settings, influenced by poor antenatal optimization of hemoglobin, scarce supply of uterotonics and lags in operative action.[7] In addition to this, regional studies have indicated. the role of preeclampsia, multiple gestation and extended obstructed labor in blood loss during caesarean births.[8]

Local institutional information is therefore critical in the process of coming up with contextual intervention. A number Bangladesh clinical trials on the methods of minimizing the PPH during caesarean birth have been conducted. For example, one randomized controlled trial established carbetocin useful in the prevention of uterine atony during caesarean section, in comparison with oxytocin, which is demonstrating the possible effectiveness of optimized pharmacologic prevention.[9] The proposed research will focus on establishing the commonality of postpartum bleeding and the risk factors involved in the samples of women experiencing the same caesarean section at Popular Medical College.

METHODS

This cross-sectional research was done in the Department of Obstetrics and Gynecology of Popular Medical College, Dhaka, Bangladesh from January 2024 to January 2025, using 68 women who had undergone caesarean delivery during the study period. The women were recruited when they used the caesarean section and were fully supplied in the ante natal intra and post-operative records. Exclusion criteria were known bleeding disorders, chronic anticoagulant therapy, coagulopathies, incomplete medical histories or non-participation. Data were recorded with the help of a structured checklist on the socio-demographics, obstetric history, antenatal risk factors, operative indicators and maternal outcomes. PPH was considered to be ≥1000 ml of blood. loss in the post caesarean and the severe PPH was considered ≥1500 ml or transfusion of at least two units of. blood. Antenatal anemia was set at hemoglobin less than 11 g/dl and placental abnormalities (previa/accreta) were diagnosed clinical or radiological diagnosis. The variables that were studied were prevalence of PPH, risk factors. and maternal effects like transfusion and ICU hospitalization.

The analysis of data was performed with the help of descriptive statistics. Association with the SPSS version 25.0 with $p<0.05$ as a significance level. Ethical approval was obtained from the Institutional Review Board of Popular Medical College.

RESULTS

Most participants were between 20–29 years (41.2%) and nearly half were multiparous (47.1%). The majority resided in urban areas (72.1%) (Table 1). Term pregnancies constituted 70.6% of cases. Antenatal anemia was present in 42.6% of women, hypertensive disorders in 22.1% and placental abnormalities in 11.8% (Table 2). Previous caesarean section (29.4%) and fetal distress (20.6%) were the most frequent indications for caesarean section, followed by obstructed or prolonged labor (17.6%) (Table 3). Postpartum hemorrhage occurred in 20.6% of women. Among PPH cases, 64.3% had blood loss between 1000–1499 ml and 35.7% had ≥1500 ml. Blood transfusion was required in 16.2% of participants (Table 4).

Higher proportions of PPH were observed among women with anemia (34.5%), hypertensive disorders (40%), placental abnormalities (62.5%), emergency caesarean delivery (28.6%) and prolonged labor (41.7%). Previous caesarean section showed no significant association with PPH (Table 5). Among the 14 women who developed PPH, 78.6% required blood transfusion and 71.4% required two or more uterotonics. ICU admission occurred in 28.6% of cases and 14.3% required surgical intervention (Table 6).

Table 1: Socio-demographic characteristics of participants (n=68).

Variable	Category	Frequency (N)	%
Age group (in years)	<20	6	8.8
	20–29	28	41.2
	30–34	22	32.4
	≥35	12	17.6

Continued.

Variable	Category	Frequency (N)	%
Parity	Nulliparous	24	35.3
	Multiparous (1–2)	32	47.1
	Multiparous (≥3)	12	17.6
Residence	Urban	49	72.1
	Rural	19	27.9

Table 2: Obstetric and clinical characteristics (n=68).

Variable	Category	N (%)
Gestational age	Preterm (<37 weeks)	10 (14.7)
	Term (37–40 weeks)	48 (70.6)
	Post-term (>40 weeks)	10 (14.7)
Antenatal anemia (Hb <11 g/dl)	Present	29 (42.6)
	Absent	39 (57.4)
Hypertensive disorders of pregnancy	Present	15 (22.1)
	Absent	53 (77.9)
Placental abnormalities	Previa	5 (7.4)
	Accreta spectrum	3 (4.4)
	None	60 (88.2)

Table 3: Indications for cesarean delivery (n=68).

Indication	Frequency (N)	%
Previous cesarean section	20	29.4
Fetal distress	14	20.6
Obstructed or prolonged labor	12	17.6
Malpresentation	8	11.8
Severe preeclampsia/eclampsia	7	10.3
Placenta previa/accreta	4	5.9
Others	3	4.4

Table 4: Prevalence and severity of postpartum hemorrhage (n=68).

Variable	Category	N (%)
PPH occurrence	Yes	14
	No	54
Severity of PPH (estimated blood loss)	1000–1499 ml	9 (64.3)*
	≥1500 ml	5 (35.7)*
PPH requiring blood transfusion	Yes	11
	No	57

*Percentage among PPH cases (n=14).

Table 5: Association of maternal and obstetric factors with PPH (n=68).

Risk factor	Present (N)	PPH (N)	PPH (%)	P value
Antenatal anemia	29	10	34.5	0.02*
Hypertensive disorders	15	6	40.0	0.03*
Placenta previa/accreta	8	5	62.5	0.001*
Emergency cesarean	42	12	28.6	0.04*
Previous cesarean	20	4	20.0	0.41
Prolonged labor	12	5	41.7	0.03*

*Significant at $p<0.05$.

Table 6: Maternal outcomes among PPH cases (n=14).

Outcome	N	%
Blood transfusion required	11	78.6
ICU admission	4	28.6

Continued.

Outcome	N	%
Use of ≥2 uterotonics	10	71.4
Surgical intervention (B-Lynch, ligation)	2	14.3
No major complications	6	42.9

DISCUSSION

In this study of 68 caesarean deliveries at Popular Medical College, the prevalence of PPH was 20.6% (14/68). Gong et al, reviewed 3,498 caesarean deliveries and reported a PPH rate of approximately 20%, which is remarkably close to our observed prevalence.[10] They found placenta previa/accreta and antenatal anemia to be significant contributors and this is in line with the trend of risk factors which exist among our PPH cases. In 7.4% of the total population of women (5/68), we noted severe hemorrhage (≥1500 ml). Zewdu et al reported severe PPH in 3.6% of the caesarean births in Ethiopia, which is lower than our 7.4%.[7]

This difference may represent the differences in comorbidities in patients, abnormal placental rates and surgical habits in institutions among cohorts. Our sample had 42.6% (29/68) of antenatal anemia and anemia was significantly related with PPH (PPH in anemic mothers=34.5%). It was established by Butwick et al that low predelivery hemoglobin is a significant risk factor in the occurrence of severe PPH with greater odds of hemorrhage being recorded amongst mothers with anemia who have undergone a caesarean section.[3]

Equally, Ahmadzia et al have also validated anemia to be one of the best predictors of peripartum transfusion, which supports our conclusion that anemic women bore a significantly larger burden of hemorrhage.[11] This study found a close connection between placenta previa/accreta and hemorrhage: 62.5% (5/8) of the women diagnosed with an abnormal placentation had PPH. Gong et al revealed that placenta previa and placenta accreta were considered as one of the most potent independent predictors of PPH, which is in line with the high rate observed in our series.[10] We discovered that emergency caesarean delivery had a larger risk of hemorrhage 28.6% (12/42) emergency cases had developed PPH. Similar trends were noted by Butwick et al who found that hemorrhage rates were higher during intrapartum or emergency caesarean section as compared to planned section as a result of hemodynamic unsteadiness, long labor duration and challenging surgeries.[3] The study conducted in the current paper showed that 16.2% (11/68) of all mothers and 78.6% of PPH cases needed blood transfusion. In a large cohort in the United States, Ahmadzia et al found markedly lower rates of transfusion in general (2-3%), although they were found significantly increased in the presence of anemia, placenta abnormalities and caesarean section at birth, which is exactly the situation with most of the women in our PPH cohort.[11] Thus, even though we transfuse more absolutely, the sources that are driving it are much more similar to those found in international statistics. Moreover, the severity of hemorrhage in the given group is denoted by the ICU admission (28.6% of PPH cases) and surgical hemostatic intervention (14.3% of PPH cases). In China, Wang et al developed machine-learning models and found anemia, placental abnormalities, gestational age and operative urgency to be highly predictive of postpartum bleeding volume, which is also linked to severe consequences in our population.[5]

PPH is a serious concern in low-income and middle-income nations as shown in one of the national reviews of Bangladesh, which revealed that hemorrhage caused the highest maternal mortality rate.[6] In the same manner, Yesmin et al, have done a comparative trial of prophylactic uterotonics during caesarean section in Bangladesh which have highlighted the significance of prevention measures in women at high-risk.[9]

Limitations

The limitation of the study was that the research was done in one hospital and the sample of the research is small. Therefore, the findings may not be a mirror of the entire community.

CONCLUSION

The given study indicates a high prevalence of PPH (20.6% among caesarean births in the Popular Medical College) and identifies the risk factors as an antenatal anemia, placenta previa/accreta and emergency caesarean. The severity of PPH in this context was also evident in the fact that many of the affected women needed transfusion and critical care.

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REFERENCES

1. Romero Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. The Lancet Global Health. 2014;2(6):323-33.
2. World Health Organization. WHO recommendations for the prevention and treatment of postpartum haemorrhage. In WHO recommendations for the prevention and treatment of postpartum haemorrhage. 2012.
3. Butwick AJ, Ramachandran B, Hegde P, Riley ET, El-Sayed YY, Nelson LM. Risk factors for severe

postpartum hemorrhage after cesarean delivery: case-control studies. Anesth Analg. 2017;125(2):523-32.
4. Gong J, Chen Z, Zhang Y, Liu YY, Pu JC, Xiong CY, et al. Risk-factor model for postpartum hemorrhage after cesarean delivery: a retrospective study based on 3498 patients. Scient Rep. 2022;12(1):22100.
5. Wang M, Yi G, Zhang Y, Li M, Zhang J. Quantitative prediction of postpartum hemorrhage in cesarean section on machine learning. BMC Med Inform Dec Mak. 2024;24(1):166.
6. Jabeen S, Siddique AB, Hossain AT, Khan S, Haider MM, Tahsina T, et al. Haemorrhage-related maternal mortality in Bangladesh: Levels, trends, time of death and care-seeking practices based on nationally representative population-based surveys. J Global Heal. 2023;13:7001.
7. Zewdu D, Tantu T. Incidence and predictors of severe postpartum hemorrhage after cesarean delivery in South Central Ethiopia: a retrospective cohort study. Scient Rep. 2023;13(1):3635.
8. Hosseinzadeh M, Heshmatkhah E, Abtahi D. Prevalence and risk factors of postpartum hemorrhage in cesarean section: a retrospective cohort study. J Obst Gynec Cancer Res. 2023;8(3):285-94.
9. Yesmin S, Begum F, Bain S, Tareq AI, Parvin S, Jahan FI, et al. Carbetocin versus Oxytocin in the Prevention of Postpartum Haemorrhage after Caesarean Section. Bangladesh J Obstet Gynaecol. 2020;35(2):63-7.
10. Gong J, Chen Z, Zhang Y, Liu YY, Pu JC, Xiong CY, et al. Risk-factor model for postpartum hemorrhage after cesarean delivery: a retrospective study based on 3498 patients. Scient Reports. 2022;12(1):22100.
11. Ahmadzia HK, Phillips JM, James AH, Rice MM, Amdur RL. Predicting peripartum blood transfusion in women undergoing cesarean delivery: a risk prediction model. PLoS One. 2018;13(12):208417.

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