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Etiologies of Post-Partum Haemorrhage Following Lower Uterine Caesarean Section

Nujhat Sharmin Urmi*[1], Natia Rahnuma[1], Rukshana Khan[1], Rebeka Sultana Mishu[1], Nila Ahmed[1], Tahmina Sharmin[1]

[1] Department of Obstetrics and Gynaecology, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, Bangladesh

Abstract: ***Background:*** The most dangerous complication and the most critical cause during pregnancy and childbirth is post-partum hemorrhage (PPH). Severe anemia, acute respiratory distress syndrome (ARDS), acute renal failure (ARF), coma, and cardiac arrest are all possible side effects. Aim of the study is to find out the etiology of post-partum haemorrhage following lower uterine caesarean section. ***Materials and Methods:*** The study was carried out in the Department of Obstetrics and Gynecology, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, as a cross-sectional study. This study comprised 75 patients who had a postpartum haemorrhage after a lower uterine caesarean operation. Patient with postpartum haemorrhage after CS was assessed using a complete history, clinical examination, and appropriate investigations. Clinical history, confirmed haemodynamic condition, and quantifying blood loss were used to make the diagnosis of postpartum haemorrhage. ***Results:*** Uterine atony was the most common cause of PPH in 44 (58.7%) patients, followed by 16 (21.3%) placental abruption, 11 (14.7%) abnormalities in placental implantation, 3 (4.0%) chronic late bleeding, and 1 (1.3%) uterine rupture. Primary PPH was observed in 46 individuals (61.3%) and secondary PPH in 29 patients (38.7%). The majority of patients (93.3%) were alive, with only 5 (6.7%) dying. ***Conclusion****:* The most prevalent cause of PPH was uterine atony, which was followed by placental abruption, anomalies in placental implantation, chronic late bleeding, and uterine rupture. Individuals were found to have the majority of main PPH.

Keywords: Postpartum Hemorrhage (PPH), Uterine Atony, Lower Uterine Caesarean Section, Placental Abruption, Maternal Mortality.

Original Research Article

Correspondence:
Dr. Nujhat Sharmin Urmi
Assistant Professor, Department of Obstetrics & Gynaecology, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, Bangladesh
E-mail: drurmi470@gmail.com

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Article at a glance:

Study Purpose: *The purpose of this study was to find out the etiology of post-partum haemorrhage following lower uterine caesarean section.*
Key findings: *Uterine atony is the leading cause of postpartum hemorrhage (PPH) following lower uterine caesarean section, where the uterus fails to contract adequately after delivery.*
Newer findings: *Advances in uterotonic drugs, such as carbetocin, are showing greater efficacy in preventing uterine atony compared to traditional oxytocin, particularly in high-risk women.*
Abbreviations: *ARF: Acute Renal Failure, CS: Caesarean Section.*

INTRODUCTION

Post-partum hemorrhage (PPH) is the most serious complication and most critically important cause during pregnancy and childbirth. It can cause severe anemia, acute respiratory distress syndrome (ARDS), acute renal failure (ARF), coma, and cardiac arrest. Uterine atony, retained tissue, genital tract tear, coagulation problem, and uterine rupture are most common causes of post-partum hemorrhage. In developing countries, PPH is one of the leading causes of maternal mortality, accounting for 25–43% of maternal death.[1] PPH is usually defined as a blood loss >500 mL following a vaginal birth or a loss of >1,000 mL after a cesarean birth. The increased rates of atonic PPH have

emphasized the importance of active management in the third stage of labor.[2] In another study revealed common causes of PPH include retention of the placenta, endometritis, and delayed placental bed involution. Other less common etiologies are congenital coagulopathies, cervical cancer, submucous fibroids, placenta adherens, cesarean scar dehiscence, uterine pseudoaneurysm, and uterine rupture.[3] Postpartum hemorrhage (PPH) is the most common complication of deliveries and its magnitude is reported to be 2–4% and 6% after vaginal and cesarean-sections (C/S) deliveries respectively.[4-5] Caesarean section (CS) is a recognised risk factor for primary PPH.[10] Excess blood loss is more commonly associated with caesarean section than vaginal delivery.[14] This study could help to reduce the risk association, management and outcome of PPH case following caesarean section.[6-7]

METHODS

The cross-sectional study was carried out in the Department of Obstetrics and Gynecology, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, Bangladesh. This study comprised 75 patients who had a postpartum haemorrhage after a lower uterine caesarean. Data was collected prospectively from June 2022 to July 2023. Patient with postpartum haemorrhage after CS was assessed using a complete history, clinical examination, and appropriate investigations. Clinical history, confirmed haemodynamic condition, and quantifying blood loss were used to make the diagnosis of postpartum haemorrhage. The detailed history was included name, age, parity, socio-economic status, whether antenatal checkup was taken or not. A complete obstetric history was included duration of pregnancy, pre-eclampsia, coagulopathy, multiple gestation and antepartum haemorrhage in current pregnancy; and previous PPH, and previous caesarean section. The causes of CS such as placenta praevia, obstructed labour, failed induction prolong labour, foetal distress and malpresentaion was also recorded. Risk factors of postpartum hemorrhage following CS such as retained placental bit, puerpural sepsis, uterine atony, cervical injury and Placenta praevia was recorded. The management of post-partum haemorrhage was according to management protocol of the hospital. Categorical variables were expressed as frequency and percentage, while continuous variables, as mean and standard deviation. Data was analyzed in the Statistical Package for the Social Sciences (SPSS) 26.0 software.

RESULTS

More than one fourth (26.7%) patients belonged to age 26-30 years. The mean age was found 28.8±7.0 years with range from 19 to 41 years. More than three forth (78.7%) patients were ≥37 weeks of gestation. The mean gestational age was 37.4±1.9 weeks with range from 36 to 40 weeks. Almost two third (64.0%) patients had multi gravida and 27(36.0%) had primigravida. Majority (38.7%) of the patients received antenatal check-up irregularly, 21(28.0%) received regularly and 25(33.3%) didn't received any antenatal check-up (Table-1). 44(58.7%) patients were found in uterine atony, 16(21.3%) in placental abruption, 11(14.7%) in defects in placental insertion, 3(4.0%) in persistent late hemorrhage and 1(1.3%) in uterine rupture (Table-2). 46(61.3%) patients were found primary PPH and 29(38.7%) was secondary PPH (Figure-1). Majority (93.3%) patients were alive and 5(6.7%) were death (Table-3).

Table 1: Baseline characteristics of the patients (n=75)

Variables	Frequency	Percentage
Age (Year)		
≤20	17	22.7
21-25	10	13.3
26-30	20	26.7
31-35	16	21.3
>35	12	16.0
Mean ±SD	28.8	±7.0
Gestational age (weeks)		
<37	16	21.3
≥37	59	78.7

Mean±SD	37.4	±1.9
Gravida		
Primigravida	27	36.0
Multigravida	48	64.0
Antenatal check-up		
Regular	21	28.0
Irregular	29	38.7
Not done	25	33.3

Table 2: Distribution of the study patients according to cause of PPH (n=75)

Cause of PPH	Frequency	Percentage
Uterine atony	44	58.7
Placental abruption	16	21.3
Defects in placental insertion	11	14.7
Persistent late hemorrhage	3	4.0
Uterine rupture	1	1.3

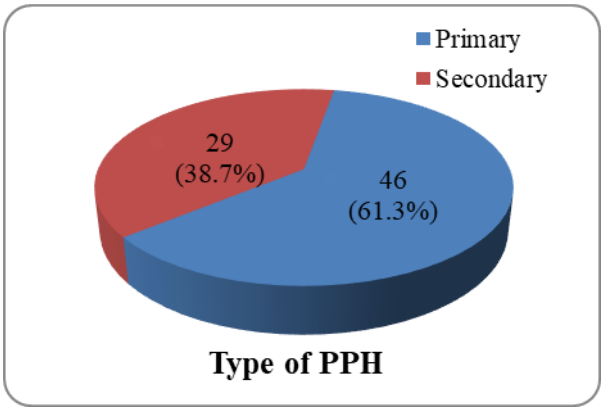

Figure 1: Pie chart showing type of PPH of the study patients (n=75)

Table 3: Maternal outcome of the study patients (n=75)

Maternal outcome	Frequency	Percentage
Death	5	6.7
Alive	70	93.3

DISCUSSION

In this present study it was observed that more than one fourth (26.7%) patients belonged to age 26-30 years. The mean age was found 28.8±7.0 years with range from 19 to 41 years. Similar observation was found Gupta et al. study they showed PPH is more prevalent in elderly age group between 36-40 years (28%) and 20% in >40 years.[8] Chen et al. study found that the mean age was found 31 years.[9] Montufar-Rueda et al. the mean age was found 25.31±7.3 years.[10] In this current study, more than three forth (78.7%) patients were ≥37 weeks of gestation. The mean gestational age was 37.4±1.9 weeks with range from 36 to 40 weeks. Montufar-Rueda et al. study observed that the mean gestational age was found 37.6±3.2 weeks.[10]

In this study, almost two third (64.0%) patients had multi gravida and 27(36.0%) had primigravida. Gupta et al. study observed that haemorrhage occurred in primigravidae 30% and 70% in multigravidae.[8] Edhiet al. study observed that most of the patients had post-partum hemorrhage after the delivery of 1st child 10(38.5%), while 8(30.8%) suffered after the birth of 3rd child and 4(15.4%) suffered after the birth of 2nd child.[11] In study of Shabnamet al. observed that 47(50.5%) were primigravida and 46(49.5%) were multigravida.[12]

In this current study it was observed that 44(58.7%) patients were found in uterine atony, 16(21.3%) in placental abruption, 11(14.7%) in defects in placental insertion, 3(4.0%) in persistent late hemorrhage and 1(1.3%) in uterine rupture. Shao and Pradhan study showed that placenta previa found in 48 cases (35.3%) was the commonest cause of hemorrhage.[13] Uterine atony occurred in 42 (30.9%) cases with blood loss more than 500ml. Forty-six cases (33.8%) had lower segment bleeding from minimal (<500ml) to maximum massive bleeding (>5000ml) leading to hysterectomy to save mother's life. Yousuf and Haider study observed that regarding causes of PPH, most common cause was uterine atony found in 76(64.4%) cases, followed by perineal and vaginal tears in 41(34.7%) and prolonged labor in 29(24.5%).[14] Naz et al. study reported that the major cause of PPH was uterine atony found in 29 (58%) cases, followed by cervical, vaginal and perineal tears in 12 (24%) cases.[15]

Nyflot et al. findings suggest that retained placental tissue may be a more prominent cause of severe PPH than previously reported.[16] False reporting of cases caused by retained placental tissue as atonic bleeding in registries could explain this discrepancy. Retained placental tissue, including abnormal placentation, has been estimated to cause approximately 10% of all PPHs.[17] In a study examining risk factors and outcomes of massive blood transfusions during delivery, abnormal placentation was reported to be the most common cause (26.6%).[18] In this study it was observed that 46(61.3%) patients were found primary PPH and 29(38.7%) was secondary PPH. Edhi et al. study observed that 18(69.2%) patients had primary post-partum hemorrhage and 8(30.8%) had secondary post-partum hemorrhage.[11] Shabnamet al. total 1800 deliveries occurred in 6-month duration.[12] Out of which 93 women were developed primary postpartum hemorrhage, thus representing the frequency of 5.1%.

In this present study it was observed that majority (93.3%) patients were alive and 5(6.7%) were death. Shao and Pradhan study reported 1(0.7%) patients were maternal death.[13] Naz et al. showed maternal morbidity was detected in 31 (62%) of cases.[15]

CONCLUSION

The most common cause of PPH was uterine atony, which was followed by placental abruption, abnormalities in placental implantation, chronic late bleeding, and uterine rupture. Individuals were found to have the majority of primary PPH.

Authors' contributions

NSU, NR, RK: Concept and design, data acquisition, interpretation and drafting. RSM, NA and TS: Data acquisition, interpretation, drafting, final approval and agree to be accountable for all aspects of the work.

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