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MATERNAL OUTCOMES IN POSTPARTUM HEMORRHAGE AFTER CESAREAN SECTION

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Abstract

Objective: *to determine the frequency of maternal outcomes in postpartum hemorrhage after cesarean section at a tertiary care hospital*

Study design: *Descriptive study*

Place and duration of study: *Department of Obstetrics & Gynecology, Unit-IV, Liaquat University of Medical and Health Sciences Jamshoro, over a period of one year from March 2024 to February 2025.*

Methodology: *A total of 114 women develop PPH after cesarean within 24 hours had age between 18 – 45 years, gestational age ≥28 weeks, irrespective of parity, both booked and un-booked cases were included via non-probability sampling technique. Women were included either through emergency or outpatient department. Patients with cardiac diseases, diabetes mellitus, chronic kidney diseases, with history of bleeding disorder and taking therapeutic anticoagulants were excluded from the study. After taking the baseline data, women were evaluated for the maternal outcomes of PPH after cesarean section. Data was analyzed with the help of SPSS version 27.0. Mean ± SD was reported for quantitative data, whereas, frequency and percentages were computed for qualitative data. Stratification was done to control the effect modifiers. Post-stratification Chi-square test was applied. P-value ≤ 0.05 was taken as significant.*

Results: *The mean age of the women enrolled in this study was 26.31 ± 4.45 years, mean BMI was 25.46 ± 2.42 kg/m^2 and mean gestational age was 38.03 ± 1.45 weeks. 49 (42.9%) were primigravida and 65 (57.1%) were multigravida. 44 (38.6%) had previous C-section and women were rural resided 16 (14%). Maternal outcomes in women with postpartum hemorrhage after cesarean section were assessed, most frequent outcome which was observed in this study was anemia 79 (69.2%) followed by hypovolemic shock 23 (20%), hysterectomy 2 (1.75%) and acute renal failure 2 (1.75%) each.*

Conclusion: *We noted a high rate of anemia in women who developed PPH after C-section in this study. Addressing anemia during pregnancy and further research in this area are recommended to improve maternal outcomes*

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INTRODUCTION

Postpartum haemorrhage (PPH) is a major cause of maternal morbidity and mortality, accounting for about one-third of all pregnancy-related deaths in Africa and Asia[1]. Severe obstetric bleeding after childbirth is a life-threatening emergency. PPH occurs in 2-4% of all vaginal deliveries and 6-7% of cesarean deliveries.[2] The World Health Organization estimates that globally, nearly half a million maternal deaths occur during the antepartum, partum and postpartum period.[3] Evidence from developing countries has shown that a mother remains at risk during her postpartum period even after a safe antepartum and partum period.[4]

The major risk factors that contribute to PPH are uterine atony, prolonged third phase of labor, retained placenta, maternal age of above 35 years, gestational age above 37 weeks, pregnancy induced hypertension, anemia, having previous history of PPH, uterine rupture, abruptio placenta, placenta previa.[5] The high magnitude of PPH and its adverse outcome is still a major health problem in developing countries.[6] The mothers with PPH, are at higher risk of several complications, including severe anemia, hypovolemic shock, acute renal failure, need a blood transfusions, open surgery, care in intensive care units, disseminated intravascular coagulation, hysterectomy and cardiac arrest or death.[7,8] The proper identification of women at higher risk of PPH is crucial to enable optimization of the available interventions to reduce the associated maternal deaths or other adverse maternal outcomes.[9,10]

The current study was designed to determine the frequency of maternal outcomes in postpartum hemorrhage after cesarean section at a tertiary care hospital. The motive behind carrying out this study was to prevent this dreadful complication especially in developing countries like Pakistan where modalities of treatment may not be readily available.

METHODOLOGY:

This study was conducted in the department of Obstetrics & Gynecology, Liaquat University of Medical and Health Sciences Jamshoro, over a period of one year from March 2024 to February 2025. After taking written informed consent, a total of 114 women develop PPH after cesarean within 24 hours had age between 18 – 45 years, gestational age ≥28 weeks, irrespective of parity, both booked and un-booked cases were included via non-probability sampling technique. Women were included either through emergency or outpatient department. Patients with cardiac diseases, diabetes mellitus, chronic kidney diseases, with history of bleeding disorder and taking therapeutic anticoagulants were excluded from the study. Sample size was calculated by using OPENEPI calculator by taking the prevalence of anemia in patients i.e. P = 90.1%[9], margin of error, d = 5.5%, level of confidence = 95%, then calculated sample was 114. After taking the baseline data, women were evaluated for the maternal outcomes of PPH after cesarean section.

Data was analyzed with the help of SPSS version 27.0. Mean±SD was reported for quantitative data, whereas, frequency and percentages were computed for qualitative data. Stratification was done to control the effect modifiers. Post-stratification Chi-square test was applied. P-value ≤ 0.05 was taken as significant.

RESULTS:

The mean age of the women enrolled in this study was 26.31 ± 4.45 years, mean BMI was 25.46 ± 2.42 kg/m^2 and mean gestational age was 38.03 ± 1.45 weeks. 49 (42.9%) were primigravida and 65 (57.1%) were multigravida. 44 (38.6%) had previous C-section and women were rural resided 16 (14%), as shown in **(Table 1)**. Maternal outcomes in women with postpartum hemorrhage after cesarean section were assessed, most frequent outcome which was observed in this study was anemia 79 (69.2%) followed by hypovolemic shock 23 (20%), hysterectomy 2 (1.75%) and acute renal failure 2 (1.75%) each, as shown in **(Table 2)**. Maternal outcomes were also compared with respect to baseline data, no statistically significant difference was observed as p-value was > 0.05, as shown in **(Table 3)**.

Table 1: Baseline Data of the Patients (n = 114)

Baseline Data	Mean ± SD/ n(%)
Age (years)	26.31 ± 4.45
BMI (kg/m^2)	25.46 ±2.42
Gestational age (weeks)	38.03 ± 1.45
Parity	
• Primigravida	49 (42.9%)
• Multigravida	65 (57.1%)
Previous C-section	
• Yes	44 (38.6%)
• No	70 (61.4%)
Residential Status:	
• Urban	98 (86%)
• Rural	16 (14%)

Table 2: Maternal outcomes in women with postpartum hemorrhage after cesarean section (n = 114)

Maternal Outcomes	n(%)
Hysterectomy	2 (1.75)%
Hypovolemic shock	23 (20%)
Anemia	79 (69.2%)
Acute renal failure	2 (1.75%)

Table 3: Comparison of Maternal outcomes in women with postpartum hemorrhage after cesarean section with respect to baseline data (n = 114)

Baseline Data	Maternal Outcomes				P-value
	Hysterectomy	Hypovolemic shock	Anemia	Acute renal failure	
Age (years)					
• ≤30 (n=67)	00	14	41	01	0.412
• >30 (n=47)	02	09	38	01	
BMI (kg/m^2)					
• ≤ 25 (n=81)	01	08	51	01	0.087
• >25 (n=33)	01	15	28	01	
Gestational age (weeks)					
• 37-39 (n= 101)	00	17	61	01	0.078
• 40-42 (n=13)	02	06	18	01	
Parity					
• Primigravida	01	07	31	00	0.589
• Multigravida	01	16	48	02	

Residential Status: • Urban • Rural	02 00	05 18	15 64	01 01	0.061

DISCUSSION:

PPH and severe PPH are still associated with cesarean deliveries, particularly emergency cesarean sections.[11, 12] It is commonly established that delivery technique is a significant risk factor for mild PPH and may be a more accurate indicator of PPH than prenatal risk factors..[13] Given the increased risk of PPH from placental anomalies and adhesions, the higher prevalence of cesarean sections may be the result of more prior cesarean procedures. Another explanation would be that blood loss can be measured more objectively by weighing mop heads and measuring blood in the suction mechanism. Prior cesarean sections are among the risk factors for severe PPH following cesarean deliveries.[14,15] Our study found the rates of previous scars to be 38.6%, in patients who had PPH after cesarean.

Age above 25 years significantly increased hemorrhage and emphasizes the importance of not getting pregnant until at an older age.[16] The high incidence of bleeding contributed to age may be due to rising parity, uterine atonia, complicated placenta and increasing cesarean section rates. In our study, the age range of the women was between 18 – 45 with a mean age of 26.31 ± 4.45 years. Similar findings were found in other studies also.[17,18] They reported mean age as 26.153 ± 7.37 from Pakistan and 28 years ranging from 18 to 42 years from Iran

In this study, most frequent outcome which was observed in this study was anemia 79 (69.2%) followed by hypovolemic shock 23 (20%), hysterectomy 2 (1.75%) and Acute renal failure 2 (1.75%) each.

A Study was conducted in Pakistan, during the study period the frequency of PPH (7.1%), the major maternal outcomes were acute renal failure (6%), shock (9.9%) and anemia in patients (90.1%).[19] While another study, revealed the most common maternal outcomes of PPH, hysterectomy (6%) and hypovolemic shock (5.1%)[20]

One study reported that repair of cervical and vaginal tear were in 6 (P = 0.677), internal iliac ligation in 2 (P = 0.336), replacement of uterine inversion in 2 (P = 0.505) and similar to our results, no maternal deaths were recorded in other studies also.[21,22] Olowokere et al; found renal failure 2.9%, heart failure 5.9%, hypovlemic shock 14.7% and 1.5% of cases were maternal death in the tertiary health care facilities.[23] Kodla found cases of sepsis 8.95%, acute renal failure 8.52, 10.31% of cases underwent hysterectomy, 8.52% accounted for multi-organ failure, 4.93% of cases accounted for ARDS and maternal death occurred in 21.73% of cases.[24]

Conclusion:

We noted a high rate of anemia in women who developed PPH after C-section in this study. Addressing anemia during pregnancy and further research in this area are recommended to improve maternal outcomes. Prompt recognition and treatment of PPH significantly reduce severe maternal morbidity and mortality.

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