

# Clinical study of risk factors in patients with postpartum hemorrhage at a tertiary hospital

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## Abstract

**Background:** Postpartum hemorrhage may occur in 1-5% of deliveries in developed as well as in developing countries and it is still most common cause of maternal morbidity and mortality. Clinicians must be aware of risk factors for PPH and should take these into account when counselling women about place of delivery. Present study was aimed to study risk factors in patients with postpartum hemorrhage at a tertiary hospital. **Material and Methods:** Present study was hospital based, prospective, observational study, conducted in pregnant women, > 18 years, delivered at our hospital, had labelled with postpartum hemorrhage. **Results:** During two-year study period, 4892 deliveries were conducted at our hospital, 86 patients had postpartum hemorrhage (1.76 %), majority were from 21-24 years (37.21 %) followed by 25-29 years age group (31.4 %). Mean age of study group was  $23.53 \pm 3.92$  years. In present study common risk factors were severe anaemia (Hb < 7 gm%) (36.05 %), previous LSCS (26.74 %), hypertensive disorders of pregnancy (22.09 %), premature rupture of membranes (17.44 %), hypothyroidism (17.44 %), abruptio placentae (17.44 %), Prolonged labor (15.12 %) and placenta previa (15.12 %). Interventions other than more than 2 uterotronics (100.00 %) and > 2 PCV blood transfusions (84.88%), were bilateral uterine artery ligation (45.35%), bilateral uterine artery ligation + bilateral internal iliac artery ligation (9.30%), obstetric hysterectomy (15.12%) and perineal tear repair (9.30%). Mortality was noted in six patients (atonic PPH – 3 cases, mixed PPH 2 cases, placenta accreta spectrum- 1 case) **Conclusion:** In present study, significant risk factors for post-partum hemorrhage were 21-24 years age, primipara, severe anaemia (Hb < 7 gm%), previous LSCS, hypertensive disorders of pregnancy, premature rupture of membranes, hypothyroidism, abruptio placentae, prolonged labor and placenta previa.

**Keywords:** risk factors, post-partum hemorrhage, atonic PPH, previous LSCS, hypertensive disorders of pregnancy.

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## INTRODUCTION

Postpartum hemorrhage may occur in 1-5% of deliveries in developed as well as in developing countries and it is still most common cause of maternal morbidity and mortality.<sup>1</sup> Postpartum hemorrhage is labelled when in vaginal delivery blood loss of above 500 ml, in C-section blood loss of above 1000 ml or 1500 ml loss in obstetric

hysterectomy. Another definition of PPH is that blood loss sufficient to cause hypovolemia, a 10% drop in the hematocrit or requiring transfusion of blood products (regardless of route of delivery).<sup>1,2</sup> Post-partum hemorrhage is a preventable cause of maternal mortality. Maternal deaths due to post-partum hemorrhage are significantly low (approximately 8%) in developed countries. i.e. pregnant women giving childbirth in the developing countries are exposed to greater risk of dying during labour than countries in their developed counterparts.<sup>3</sup> Several risk factors for PPH are known, such as anemia, multiple pregnancy, Obstetric interventions ( augmentation and induction of labor, instrumental vaginal delivery, cesarean delivery) and chorio-amnionitis, however PPH may occur among patients with no known risk factors.<sup>4</sup> Prediction strategy assumes risk factor evaluation before any childbirth. Risk factors for PPH may present antenatally or intrapartum; care plans must be modified as and when risk factors arise.

Clinicians must be aware of risk factors for PPH and should take these into account when counselling women about place of delivery. Our ability to reduce the risk of PPH depends on ongoing investigations of previously unaccounted for causes and risk factors. Present study was aimed to study risk factors in patients with postpartum hemorrhage at a tertiary hospital

## MATERIAL AND METHODS

Present study was hospital based, prospective, observational study, conducted in Department Gynaecology and Obstetrics, Bharati Vidyapeeth University, Sangli, India. Study duration was of 2 years (July 2019 to June 2021). Study approval was taken from institutional ethical committee.

**Inclusion criteria:** Pregnant women, >18 years, delivered at our hospital, with any one of the following criteria: Patients with estimated blood loss more than 500 ml after vaginal delivery, more than 1000ml after caesarean

delivery, 1500 ml loss in obstetric hysterectomy. Patients with excessive bleeding that makes the patient symptomatic (e.g., Light-headedness, vertigo, syncope) and/or results in signs of hypovolemia (eg, hypotension, tachycardia or oliguria). Patients with >10 % decline in postpartum haemoglobin concentration from prepartum levels or required blood transfusion.

**Exclusion criteria-** Women who are too sick to give consent or to be interviewed or not willing to participate in the study.

A written informed consent was taken for participation from patient/relatives. Demographic and clinical data such as maternal age, gestational age, parity, history of abortions, prior obstetric history, co-morbidity period of gestation, risk factors for PPH, amount of blood loss, mode of delivery, birth weight of child, causes of PPH, blood transfusion, management of PPH and maternal morbidity. Data was collected and compiled using Microsoft Excel, statistical analysis was done using descriptive statistics.

## RESULTS

During two year study period, 4892 deliveries were conducted at our hospital, 86 patients had postpartum hemorrhage (1.76 %), majority were from 21-24 years (37.21 %) followed by 25-29 years age group (31.4 %). Mean age of study group was  $23.53 \pm 3.92$  years. As per parity status majority were primiparous (51.16 %) followed by parity status >2 (26.74 %). As per gestational age majority were from 38-40 weeks (31.4 %) followed by 36-38 weeks (26.74 %)

**Table 1: General characteristics**

Characteristics	No. of cases	Percentages
Age in years		
19-20	3	3.49%
21-24	32	37.21%
25-29	27	31.40%
30-34	16	18.60%
$\geq 35$	8	9.30%
Parity		
1	44	51.16%
2	19	22.09%
>2	23	26.74%
Gestational age (weeks)		
<34 weeks	8	9.30%
34- 36	9	10.47%
36- 38	23	26.74%
38- 40	27	31.40%
>40	19	22.09%

In present study common risk factors were severe anaemia (Hb < 7 gm%) (36.05 %), previous LSCS (26.74 %), hypertensive disorders of pregnancy (22.09 %), premature rupture of membranes (17.44 %), hypothyroidism (17.44 %), abruptio placentae (17.44 %), Prolonged labor (15.12 %) and placenta previa (15.12 %).

**Table 2: Risk factors associated with PPH**

Risk factors	No. of cases	Percentages
Severe Anaemia (Hb < 7 gm%)	31	36.05%
Previous LSCS	23	26.74%
Hypertensive disorders od pregnancy	19	22.09%
Premature rupture of membranes	15	17.44%
Hypothyroidism	15	17.44%

Abruptio placentae	15	17.44%
Placenta previa	13	15.12%
Prolonged labor	13	15.12%
Mal presentation	9	10.47%
Instrumental delivery	9	10.47%
Genital trauma	8	9.30%
Gestational diabetes mellitus	8	9.30%
Fever	7	8.14%
Primary LSCS	6	6.98%
Multiple pregnancy	5	5.81%
Macrosomia (Birth weight > 4 kg)	5	5.81%
Polyhydramnios	5	5.81%
Placenta accreta spectrum	1	1.16%
Fibroid uterus	1	1.16%

Interventions other than more than 2 uterotronics (100.00 %) and > 2 PCV blood transfusions (84.88%), were bilateral uterine artery ligation (45.35%), bilateral uterine artery ligation + bilateral internal iliac artery ligation (9.30%), obstetric hysterectomy (15.12%) and perineal tear repair (9.30%). Mortality was noted in six patients (atonic PPH – 3 cases, mixed PPH 2 cases, placenta accreta spectrum- 1 case).

**Table 3:** Management outcomes.

Type of intervention for PPH	No. of cases	Percentages
Uterotonics > 2	86	100.00%
Blood transfusions > 2 PCVs	73	84.88%
Surgical intervention		
Bilateral uterine artery ligation	39	45.35%
Bilateral uterine artery ligation + bilateral internal iliac artery ligation	8	9.30%
Obstetric hysterectomy	13	15.12%
Perineal tear repair	8	9.30%
Mortality	6	6.98%

## DISCUSSION

Atonicity of the uterus is the commonest cause of PPH: with the separation of the placenta, the uterine sinuses, which are torn, cannot be compressed effectively due to imperfect contraction and retraction of the uterine musculature and the bleeding continues.<sup>6</sup> Apart from an increased risk of maternal mortality (12 to 17.2%) EPH may lead to further serious complications related to severe anemia, such as acute kidney injury (29.3%), hepatic failure, Sheehan Syndrome, adult respiratory distress syndrome (24.6%) and disseminated intravascular coagulopathy (DIC) (11.7%)<sup>7</sup> Rajeshwari, *et al.*,<sup>8</sup> studied 142 women with postpartum hemorrhage, majority of the women were primiparous, in the age group of 25 to 29 years, and, pre-existing anaemia was seen in 11%, PROM in 16%, hypothyroidism in 20% were found as risk factors and 19% of the woman underwent secondary LSCS. Similar findings were noted in present study. Chandrika SK<sup>9</sup> noted that severe obstetrical hemorrhage (more than 1500 ml) was in 115 patients (prevalence of 0.9%). The prevalence of severe obstetric hemorrhage was 0.9 %. A large proportion of the patients (62%) were multipara. Mortality in this study was 21.73% and morbidity was 78.26%. Most common cause of obstetric hemorrhage in this study was uterine atonic PPH. In a study of 80 cases of PPH, Yogesh T *et al.*,<sup>10</sup> noted that PPH was common

between 25 – 28 years of age, mean gestational age of the  $36.5 \pm 3.4$  weeks and of higher parity. Preeclampsia (35%) followed by Prolonged labour (26.3) were important risk factors for PPH. Nanani M.<sup>11</sup> studied 200 cases of PPH, most common risk factor for the post-partum hemorrhage was the atonicity of the uterus (84%) followed by PIH (37%), APH (22.5%), prolonged labour (14%) and retained placental products (8.5%) cases of PPH. Others were large baby induced PPH (7%), genital tract Injuries (6.5%), ruptured uterus (4.5%), multi parity (4.5%), infections (2.5%) and uterine inversion (1%). In a study Kebede BA *et al.*,<sup>12</sup> noted that among 422 study participants, overall prevalence of primary postpartum hemorrhage was 16.6%. Mothers aged 35 and above [AOR = 6.8, 95% CI (3.6, 16.0)], pre-partum anemia [AOR = 5.3, 95% CI (2.2, 12.8)], complications during labor [AOR = 1.8, 95% CI (2.8, 4.2)], history of previous postpartum hemorrhage [AOR = 2.7, 95% CI (1.1, 6.8)] and instrumental delivery [AOR = 5.3, 95% CI (2.2, 12.8)] were significant predictors of primary postpartum hemorrhage. PPH may be aggravated by pre-existing anaemia and, in such instances, the loss of a smaller volume of blood may still result in adverse clinical sequelae. Anaemia in pregnancy is common and linked to postpartum hemorrhage in terms of uterine atony. The more severe the anaemia, the more likely the greater blood

loss and adverse outcome. It is possible to early identify mothers with anemia in their antenatal care follow-up, and take appropriate measures.<sup>12</sup> The speed with which death from PPH occurs presents a major challenge in settings with poor communications and referral systems and shortages of necessary drugs and equipment. Active management of the third stage of labour is highly effective at preventing postpartum hemorrhage among facility-based deliveries. It is more effective than physiological management in preventing blood loss, severe postpartum hemorrhage (>500 ml) and prolonged third stage of labour.<sup>13</sup> Given that PPH can occur without warning, rural communities should consider ways to increase both primary prevention (iron supplementation, AMTS) and secondary prevention of PPH (availability of obstetric first aid, availability of transport, and availability of emergency obstetric care).<sup>14</sup>

## CONCLUSION

In present study, significant risk factors for post-partum hemorrhage were 21-24 years age, primipara, severe anaemia (Hb < 7 gm%), previous LSCS, hypertensive disorders of pregnancy, premature rupture of membranes, hypothyroidism, abruptio placentae, prolonged labor and placenta previa. Anemia is a correctable entity, significantly associated with uterine atony and should be corrected antenatally on a priority basis.

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