

A Clinical Study of incidence and Risk Factors for Primary Postpartum Haemorrhage at Tertiary Care Hospital

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Abstract: Globally, postpartum hemorrhage (PPH) is a leading cause of maternal mortality. The global prevalence PPH is 6 to 11 %. The incidence of maternal death in India due to haemorrhage are 25.6%. Common causes of PPH are uterine atony, tissue(retained products of conception), failure of the blood coagulation system and trauma. A prospective cohort study was conducted at Umaid Hospital, Jodhpur. All the patients were diagnosed as PPH at tertiary care hospital from January 2017 to September 2017. In this study all women were included with primary postpartum hemorrhage (PPH) following pregnancy >24 weeks" gestation beyond with all modes of birth in any setting (hospital, birth centers, home vaginal delivery and caesarean section) was referred and at Umaid Hospital. The cross tabulations were used to study the demographic, obstetrical and medical factors in women with severe obstetrical haemorrhage. Total number of 18,432 patients delivered during this period. Results showed that obstetrical haemorrhage was in 350 patients (incidence of 1.89%). As 87.72% of the patients in study were rural, it contributed the high prevalence rate & antenatal care. A large proportion of the patients (73.72%) were multipara. Mortality in this study was 21.7% and most common morbidity was postpartum anemia 98.58%. Most common cause of obstetric haemorrhage in this study was uterine atonic pph. The frequency and impact of severe hemorrhage can be effectively reduced by reducing avoidable risk factors, especially those related to obstetric interventions as increased Caesarean section rate and induction of labor. Other risk factors not amenable to change such as age, ethnic origin, and preexisting medical diseases or bleeding disorders can be minimized by extra vigilance and planned conjoined management.

Keywords: Postpartum hemorrhage, Uterine atony, Maternal mortality, Antenatal care

1. Background

Globally, postpartum hemorrhage (PPH) is a leading cause of maternal mortality¹. The global prevalence PPH is 6 to 11 %^{2,3}. Rates vary by data source and country as well as assessment method with a prevalence of 10.6% when measured by objective appraisal of blood loss and 7.2% with subjective techniques. The incidence of maternal death in India due to haemorrhage are 25.6%⁴. However, there is little information on the magnitude and risk factors for PPH. Common causes of PPH are uterine atony, tissue (retained products of conception), failure of the blood coagulation system and trauma. Uterine atony is responsible for the majority (75 %) of PPH⁵. Risk factors for PPH include; past history of PPH, multiple pregnancy, fetal macrosomia, primi-gravida, grand multi-parity, older age, preterm births, genital tract injuries, non-use of oxytocics for PPH prophylaxis, labour induction, caesarean birth and intra-uterine fetal deaths. However, majority of these studies visually estimated blood loss, a method that has considerable inaccuracy⁶. The few studies that have objectively measured blood loss after childbirth are in developing countries, whose delivery settings differ from those in developed countries. Knowledge of the risk factors would inform public health interventions for PPH control. To the clinicians, risk factor identification in the antenatal and intrapartum periods may provide an opportunity for timely interventions to prevent PPH. The present study was undertaken to objectively assess the incidence and risk factors for PPH among women in rural health facilities in Rajasthan (India).

2. Methods and Source of Data Collection

A prospective cohort study was conducted at Umaid Hospital, Jodhpur. All the patients were diagnosed as PPH at tertiary care hospital from January 2017 to September 2017. In this study all women were included with primary postpartum hemorrhage (PPH) following pregnancy >24 weeks" gestation beyond with all modes of birth in any setting (hospital, birth centers, home vaginal delivery and caesarean section) was referred and at Umaid Hospital. This study excluded to all women with secondary PPH. The tertiary health care center, are staffed by clinical officers, nurses, midwives, laboratory technician, and a health inspector. Maternity services offered at health center are basic essential obstetric care. The health providers in the delivery rooms in these health facilities were trained on the data collection procedure and on measurement of postpartum blood loss. During enrolment, interviewer-administered questionnaires were used to collect data on the risk factors including: previous history of PPH, woman's age in completed years, parity and HIV sero-status obtained from patient records. Gestational age at birth was calculated based on ultrasound scan estimation, the self-report of last menstrual period (LMP), or fundal height estimation. The research team noted whether labour was induced or augmented with oxytocin, the mode of delivery, performance of episiotomy, perineal tear requiring suture, single or multiple deliveries, use of oxytocics at birth to prevent PPH (injectable oxytocin 10 IU or oral misoprostol 600 micrograms) within 1 min of delivery. The primary outcome was postpartum hemorrhage defined as blood loss of 500 mls or more after childbirth, while severe postpartum hemorrhage was a blood loss of 1000 mls or more. In women who had vaginal birth, postpartum blood loss was measured using a calibrated under-buttocks VBRASSS drape⁷. After delivery of the baby and clamping of the

umbilical cord, a drape was placed under the woman's buttocks. Blood was allowed to flow into the drape for an hour or until the attending midwife felt that the flow of blood is insignificant. The total blood loss collected in the calibrated drape by attending midwife. The used drapes with their contents were disposed of correctly by the attending midwife. In women who had cesarean section, we relied on the visual estimation of blood loss by the operating clinician.

3. Results

The cross tabulations were used to study the demographic, obstetrical and medical factors in women with severe obstetrical haemorrhage. Total number of 18,432 patients delivered during this period. Results showed that obstetrical haemorrhage was in 350 patients (incidence was 1.89%).

Table 1: Incidence of postpartum haemorrhage.

Duration	Total Deliveries	Number of Patients	Incidence
Up to January 2017 to September 2017	18432	350	1.89%

Table 2: Distribution of study population according to residence

Residence	Number of patients	Percentage
Urban	43	12.28%
Rural	307	87.72%
Total	350	100%

[p < 0.0001]

In this study 307 (87.72%) patients were from rural population and 43 (12.28%) were from urban population

Table 3: Distribution of cases according to parity

Obstetric History	Number of patients	Percentage
Primipara	92	26.28%
Multipara	258	73.72%
Total	350	100%

In present study 92 (26.28%) cases were primipara followed by 258(73.72%) we

Table 4: Distribution of cases according to gestational age

Gestational age	Number of patients	Percentage
≤ 28 Weeks	15	4.28%
28 –32 Weeks	34	9.71%
32 –36 Weeks	145	41.42%
36–40 Weeks	153	43.41%
>40 Weeks	3	0.85%
Total	350	100%

[x²=178.57; d.f.=1, p < 0.0001]

In our study 153 (43.41%) were delivered between 36–40 Weeks of gestational age and 145 (41.42%) patients had delivery between 32 –36 Weeks and 34 (9.71%) cases presented at 28–32 week gestation. Only 15 (4.28%) patients delivered at ≤ 28 week gestation. 3 (0.85%) patients presented at > 40 weeks of gestation.

Table 5: Distribution of cases according to Place of Delivery

Place of Delivery	Number of patients	Percentage
CHC	169	48.28%
GH	06	1.71%
PHC	53	15.14%
Home	25	7.14%
Tertiary Centre(Umaid)	97	27.72%
Total	350	100%

In this study 72.28% patients delivered outside tertiary centre (at CHC, PHC, GH, HOME) and 27.72% delivered at tertiary centre (Umaid Hospital).

Table 6: Distribution of cases according to nature of labour

Nature of labour	Number of patients	Percentage
Induction	268	76.57%
Spontaneous	82	23.43%
Total	350	100%

In present study only induction was done in 268 (76.57%) patients and 82 (23.42%) patients delivered spontaneously.

Table 7: Distribution of cases according to mode of delivery

Mode of delivery	Number of patients	Percentage
Caesarean Section	50	14.28%
Vaginal	300	85.72%
Total	350	100%

In our study 300 (85.72%) patients were delivered by vaginal route and 50 (14.28%) were by caesarean section.

Table 8: Distribution of cases according to Cause of PPH

Cause of PPH	Number of patients	Total (%)
Atony	155	44.28%
Trauma	101	28.85%
Coagulation disorder	03	0.85%
Tissue	81	23.14%

The most common cause of Post-partum haemorrhage in present study was uterine atony which contributed to 44.28% and other cases of PPH in present study were trauma (28.85%), tissue (23.14%), trauma with atony (14.86%), and coagulation disorder (0.85%).

Table 9: Risk factor for Atoni (N=155)

Risk factor	Number of patients	Total (%)
Abruption placetae	25	16.12%
Placenta Previa	19	12.25%
Chorioamnionitis	14	9.03%
Succenturate Placenta	02	1.29%
Big Size Baby	12	7.74%
Grand Multipara	08	5.16%
Prolong Labour	27	17.41%
Gross Polyhyroamniiose	16	10.32%
prev. H/O Atonic PPH	11	7.09%
Twin Pregnancy	10	6.45%
Uterine Fibroid	03	1.93%

In our study most common risk factor was prolonged labour (17.41%) followed by Abruptio placenta (16.12%), placenta previa (12.25%), gross polyhyroamniiose (10.32%) other less common risk factors were chorioamnionitis (9.03%), prev. H/O atonic PPH (7.09%), big size baby, twin pregnancy (6.45%), grand multipara and uterine fibroid (1.93%).

4. Discussion

Postpartum hemorrhage denotes excessive bleeding through vaginal route following delivery. This study was done at Umaid Hospital attached group of Dr. S. N. Medical College, Jodhpur, during January 2017 to Sept. 2017. During this period total 18432 deliveries took place.

Table 1: Comparison according incidence to incidence of PPH

Study	Incidence of PPH
Dr.FasihaTasneem (2017) ⁸	3.5%
Shaikh et al (2013) ⁹	5.1%
Sheikh et al ¹⁰	1.47%
Edhi et al ¹¹	1.74%
Our study	1.89%

The incidence of PPH in this study was 1.89%. The Indian PPH incidence in vaginal delivery is 2–4% and in LSCS 6%. The incidence of PPH in study of Dr. Fasiha Tasneem⁸ was 3.5%. The incidence of PPH in other studies conducted in south India was 5.1% and 3.1% respectively^{9,10}.

Table 2: Comparison according to residence

Study	Rural	Urban
SamieenaAshraf et al ¹⁴	75.8%	24.2%
Temesgen et al ¹⁵	60.70%	39.30%
Present study	87.72%	12.28%

The incidence of PPH was higher in rural patients (87.72%) than urban patients (12.28%) which is statistically significant (p value = .0001). This distribution is comparable to study of Samieena Ashraf¹⁴ and Temesgen et al¹⁵

Table 2: Comparison according to parity

Study	Pimipara	Multipara
Chandrika et al ¹³	38%	62%
Al-Zirqi et al ¹⁶	36%	64%
A. E. Olowokere et al ¹⁷	37.2%	62.8%
Temesgen et al ¹⁵	26.79%	40.05%
Present study	26.28%	73.72%

In present study 258 (73.72%) cases were multipara. This result agree with study done by Chandrika S. Kodla¹³, Al-Zirqi et al¹⁶, A. E. Olowokere et al¹⁷ and Temesgen Ma et al¹⁵. Higher Parity is a risk factor for development of PPH.

Table 4: Comparison cases according to gestational age

Study	Gestational Age	Incidence
NeenaAgarwal ¹²	36–40 weeks	83%
Al Riyami N et al ¹⁸	36–46 weeks	76.02%
Our study	36–40 weeks	84.83%

In present study 153 (43.41%) were delivered between 36–40 Weeks of gestational age and 145 patients had delivery

Table 8: Comparison according to risk factors for atonicity

Study	Retained Placental bits	Abruptio Placentae	Placenta Prevea	Prolong Labour	Polyhydroamniose	Chorioamnionitis	Grand Multipara
Olowokere et al ¹⁷	52.4%	–	–	2.05%	–	2.5%	20%
Al-Zirqi et al ²¹	18.97%	3.00%	2.51%	2.40%	–	–	1.40%
Chandrika et al ¹³	7.82%	22.6%	16.52%	15.65%	–	–	5.51%
Oyelese (2010) ²²	19.8%	2.2%	–	–	9.5%	7.1%	–
Present study	41.7%	16.12%	12.25%	17.41%	10.32%	9.03%	5.16%

between (41.42%) 32–36 Weeks. Our study were comparable with NeenaAgarwal(2009)¹², Al Riyami N et al¹⁸ where incidence higher in age group of 36–40 weeks.

Table 5: Comparison according to nature of labour

Study	Spontaneous	Induction
Oyelese Y et al ²²	67.2%	32.8%
Al-Zirqi I et al ²¹	89.20%	10.80%
Chandrika et al ¹³	86.09%	13.91%
Our study	23.43%	76.57%

Our results were not correlated with studies of Oyelese Y et al²², Al-Zirqi I et al²¹ and Chandrika et al¹³ where incidence of induction of labour was less than our study. Our incidence of induction was higher (76.57%) because most of patients had high risk like PIH, abruptio placetae, chorioamninitis, jaundice, PROM, which needed induction resulting in uterine atonic PPH.

Table 6: Comparison according to mode of delivery

Study	Vaginal	Cesarean
A. E. Olowokere et al ¹⁷	89.7%	16.3%
Chandrika et al ¹³	40.86%	55.65%
Al-Zirqi et al ¹⁶	84.45%	14.80%
Temesgen et al ¹⁵	86.70%	13.33%
Present Study	85.72%	14.28%

In our study out of 350 patients 300 (85.72%) were delivered by vaginal route and 50 (14.28%) were by caesarean section. (c 2 = 111.77, df = 2, P = 000) these results comparable with a study of A. E. Olowokere et al¹⁷, Al-Zirqi et al¹⁶, Temesgen MA et al¹⁵ where PPH was recorded more in vaginal delivery because most of patient were delivered by vaginal route followed by caesarean section. Vaginal route was most preferred route for delivery as this is natural route hence incidence of PPH also high in this group

Table 7: Comparison according to cause of death

Study	Atony	Trauma	Tissue	Thrombosis
Sheikh et al ¹⁹	54%	10.77%	34%	1.23%
Parinita et al ²⁰	79.17%	16.67%	4.16%	–
Temesgen et al ¹⁵	45%	14%	40%	–
Present Study	44.28%	28.85%	23.14%	0.85%

The most common cause of Post-partum haemorrhage in present study was uterine atony which contributed to 44.28% cases. Our result correlated with study of Sheikh et al¹⁹, Parinita et al²⁰ and Temesgen et al¹⁵ where uterine atony was most common cause of PPH. Other cause of PPH in present study were trauma, these results correlated with studies of Sheikh et al¹⁸², Temesgen MA et al¹⁵ and Parinita¹⁸⁶. Tissue was third most common cause of PPH in present study which was correlated with the studies of Sheikh et al¹⁹, Temesgen MA et al¹⁵.

In present study most common risk factor for atonicity was retained placental bits (41.7%) which was comparable with the Olowokere et al¹⁷, Al-Zirqi et al²¹, Oyelese (2010)²². Retained products of conceptions impaired the contractions of uterus resulting in atonic PPH. prolonged labour (17.41%) was second most common risk factor which was comparable with the study of Chandrika et al¹³. In prolonged labour stage uterine muscles get exhausted and hypoxic resulting in atonic PPH. Abruptio placenta (16.12%) was also risk factor for PPH which was comparable with the study by Chandrika et al¹³. Abruptio placenta (16.12%) was also risk factor for PPH which was comparable with the study by Chandrika et al¹³. placenta previa (12.25%) was responsible for atonic PPH which was correlated with studies of Chandrika et al¹³. In placenta previa, placenta implants in lower segments. Lower segment not have contractile property resulting PPH. polyhydroamniose (10.32%) and chorioamnionitis (9.03%) were risk factor for PPH, comparable with study of Oyelese et al (2010)²². Chorioamnionitis responsible for inflammatory reaction in uterine muscles and lead to atonic PPH. grand multipara was risk factor for PPH, comparable with studies Chandrika et al¹³ and Al-Zirqi et al²¹.

5. Conclusion

"Women are not dying because of a diseases we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving".

The problem is in developing countries because the available effective tools for prevention and treatment of PPH are not feasible and applied practically, many birth are home deliveries with untrained birth attendants. The crux of the problem is that prevention and treatment is available but for prompt accurate diagnosis, training of birth attendants in rural settings is most important, also training for storage of drugs and of their correct use is paramount. A major factor is also delay in transportation due to lack of vehicle and poor roads hence in developing countries low technology treatments need to be looked at. Also we need to pay attention to community education, emergency obstetric care, training of birth attendants and primary health care doctors and also look at the use of newer drugs like misoprostol and newer drug delivery system like Uniject TM which have shown some promise as potential solution to this life threatening cause of maternal mortality. The training of doctors for AMTSL is very important. **So we can dream of a zero mortality and morbidity in these cases in the next 20 years.**

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