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A study of prevalence, causes, risk factors and outcome of severe obstetrics haemorrhage

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Abstract

Severe obstetric hemorrhage is the most feared obstetric emergency that can occur to any woman at childbirth. If unattended, the hemorrhage can kill even a healthy woman. The Hemorrhage accounts for nearly one-quarter of all maternal deaths and for almost half of all postpartum deaths in low-income countries. The most common type of obstetric hemorrhage is postpartum hemorrhage (PPH), mainly primary. PPH occurring within 24 h postpartum. Primary PPH is the focus of this article. This was a cross sectional observational study conducted in a Tertiary care hospital conducted from November 2010 to June 2012 having high no of referrals from city as well as periphery. The cross tabulations were used to study the demographic, obstetrical and medical factors in women with severe obstetrical haemorrhage. Total number of patients admitted in labour room was 12,800 and 12,356 patients delivered during this period. Results showed that severe obstetrical haemorrhage (more than 1500 ml) was in 115 patients (prevalence of 0.9%). The prevalence of severe obstetric haemorrhage was 0.9 %. As 85.2% 0f the patients in study were unbooked, it contributed the high prevalence rate & antenatal care. 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 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.

Introduction

Severe obstetric hemorrhage is the most feared obstetric emergency that can occur to any woman at childbirth. If unattended, the hemorrhage can kill even a healthy woman.[1] The Hemorrhage accounts for nearly one-quarter of all maternal deaths and for almost half of all postpartum deaths in low-income countries.[2,3] Obstetric haemorrhage is influenced by the definition, clinical management and characteristic of population. Obstetric haemorrhage is the world's leading cause of maternal mortality and accounts for an estimated 127,000 deaths each year. Identification and modification of certain risk factors may include previous post partum haemorrhage, multiple pregnancies, macrosomia, induction of labour, operative vaginal deliveries and cesarean section.[4, 5]

The most common type of obstetric hemorrhage is postpartum hemorrhage (PPH), mainly primary. PPH occurring within 24 h postpartum. Primary PPH is the focus of this article. Secondary PPH is less common, occurring between 24 h and 6 weeks postpartum, most likely due to infection secondary to retained placental products.[6] Any review of obstetric hemorrhage is complicated by the lack of agreement on what constitutes excessive blood loss. Primary PPH is defined according to WHO (World Health Organization) as blood loss 500 ml in the first 24 h postpartum.[7]

It is important to document the prevalence, risk factors and consequences of severe obstetric haemorrhage. Such information would help to improve both preventive and curative health care services. Hence the present study.

Material and Methods

This was a cross sectional observational study conducted in a Tertiary care hospital conducted from

November 2010 to June 2012 having high no of referrals from city as well as periphery.

Inclusion Criteria

- All anc >24 wks till 42 days post delivery with haemorrhage
- Those having Blood loss >1500ml and
- Haemodynamically unstable (collapse)

On admission to the hospital their detailed history such as name, age, parity, socio economic status, address, whether booked or unbooked, whether handled at home by untrained dais / relatives, at PHC's by health workers, medical officers, or at private nursing home were noted.

A complete obstetric history included duration of pregnancy, duration of onset of pain, history of vaginal leak, history of bleeding, etc . In case of referred case, time, date, place of referral, method of interventions like use of IV fluid, use of oxytocin, epidosin, per vaginal examination, ARM, any inducing agent instillation, episiotomy given, any instrumental use, blood transfusion, whether manual removal of placenta was tried were noted. A detailed past obstetric history, past menstrual history, past history, family and personal history were noted

Result

The cross tabulations were used to study the demographic, obstetrical and medical factors in women with severe obstetrical haemorrhage. Total number of patients admitted in labour room was 12,800 and 12,356 patients delivered during this period. Results showed that severe obstetrical haemorrhage (more than 1500 ml) was in 115 patients (prevalence of 0.9%).

Table 1: Total number of booked and unbooked cases

Type	No of cases	%
Booked	17	14.78
Unbooked	98	85.21
Total	115	100

Among 115, only 17 (14.78%) patients had antenatal checkups at least 3 visits while rest 98 (85.21%) were not booked.

Table 2: Age wise distribution of cases

Age (years)	No of cases	%
16-20	10	8.69
21-25	57	49.56
26-30	39	33.91
31-35	10	8.69
36-40	02	1.73
Total	115	100

As youngest age group was 16 & oldest was 40 years, hence above class interval was taken. Maximum cases were between age group of 21-25 which contribute to 57 (49.56%). The mean age was 25.5±4.14 years

Table 3: Parity wise distribution of cases

Parity	No of cases	%
Primigravida	39	33.91
Multigravida	71	61.73
Grand multi	05	4.34
Total	115	100

Among 115 cases, most of them i.e. 72 (61.73%) were mutigravida.

Table 4: Condition of patient on admission

Condition of patient on admission	No of cases	%
Hemodynamically stable	68	59.13
Hemodynamically unstable	47	40.86
Total	115	100

Among 115 cases, 68 (59.13%) were haemodynamically stable and rest 47 (40.86%) were hemodynamically unstable.

Table 5: Cause wise distribution of cases

Causes	No of cases	%	P value
Retained placenta	09	7.82	0.590
Genital tract trauma	05	4.34	0.750
Uterine atony	39	33.91	0.191
Abruption	26	22.60	0.926
Placenta previa	19	16.52	0.587
Coaguopathy	06	5.21	0.492
Uterine rupture	11	9.56	0.169
Total	115	100	

Among 115 patients, most common cause of obstetric haemorrhage was uterine atony which contributed to 39 (33.91%) followed by abruption 26 cases (22.60%), and placenta previa were19 (16.52%), retained placenta 9 cases (7.82%), genital tract trauma 5 cases (4.34%), coagulopathy 6 cases (5.21%) and uterine rupture were 11cases (9.56%).

Table 6: Medical variables related to cases

Medical variables	No of cases	%
Cardiac diseases	02	9.09
Hypertension	09	40.90
Diabetes mellitus	02	9.09
Sickle cell disease	06	27.27
Total	19	100

Among 115 cases, 22 patients had medical disorders, among them most common was hypertension which contribute to 09 cases (40.90%) followed by sickle cell disease 6 (27.27%).Only 2(9.09%) suffered from diabetes.

Table 7: Pregnancy related variabes

Condition	No of cases	%
Multiple pregnancy	07	5.51
Previous c s	23	18.11
PIH	32	25.19
HELLP	09	7.08
GDM	03	2.36
Anemia	53	41.73
Total	127	100

Among 115 cases, commonest risk factor for obstetric haemorrhage was anemia 53 cases (41.73%), next common being pregnancy induced hypertension 32cases (25.19%), then previous cesarean section 23 cases (18.11%) , HELLP 9 cases (7.08%) , multiple pregnancy 7 cases (5.51%), and GDM 3 cases (2.36%).

Table 8: Labor related variables (n=115)

Variables	No of cases	%
Vaginal delivery	47	40.86
Cesarean section	64	55.65
Assisted breech delivery	04	3.47
Induction of labor	16	13.91
Prolonged labor	18	15.65
Macrosomia	04	3.47
Genital tract injuries	05	4.34
Exploratory laprotomy	29	25.21

Among 115cases, 64 (55.65%) patients delivered vaginally and 47 (40.86%) underwent cesarean section and 4 (3.47%) of them had assisted breech delivery. 16 cases (8.55%) were induced & 18 cases (9.62%) had prolongeded labor. 4 cases (2.13%) accounts for macrosomia, 5 cases (2.71) had genital tract injuries 29 cases (15.5%) underwent exploratory laprotomy.

Table 9: Outcome variables related to cases (n=115)

Outcome	No of cases	%
Maternal mortality	25	21.73
Maternal morbidity	90	78.26
Perinatal mortality	32	27.82
Perinatal morbidity	68	59.13

Among 115 cases mortality occurred in 25 cases (21.73%).The common causes for mortality being shock, septicemia, pulmonary edema, DIC, ARDS, ARF and CRA. Ninety (78.26%) cases had morbidity in one form or the other as shown in the following table.

Out of 115 cases 32(27.82%) cases had perinatal mortality while 68(59.13%)had perinatal morbidity. Only 15(13.04%) delivered healthy babies.

Table 10: Secondry outcome variables or maternal morbidity indicators (n=90)

Morbidity indicators	No of cases	%	Morbidity indicators
Sepsis	20	22.22	Sepsis
DIC	19	21.11	DIC
ARF	15	16.67	ARF
Dialysis	07	7.78	Dialysis
Devascularisation	21	23.33	Devascularisation
Internal iliac A ligation	04	3.74	Internal iliac A ligation
Hystrectomy	23	25.56	Hystrectomy
Massive transfussion	79	87.78	Massive transfussion
Pulmanary edema	09	10.00	Pulmanary edema
MODS	19	21.11	MODS
ARDS	11	12.22	ARDS
Uterine artery emboisation	09	7.82	Uterine artery emboisation
Respiratory failure	18	15.65	Respiratory failure

DIC- Disseminated intravascular coagulation, ARF-acute renal failure,MODS-multiorgan dysfunction syndrome, ARDS- Acute respiratory distress syndrome.

Among 115 cases , 20 cases (8.95%) accounted for sepsis, 19 cases (8.52%) accounted for acute renal failure, 7 cases (3.13%) underwent dialysis, 21cases (9.41%) had devascularisation, & 23(10.31%) patients underwent hysterectomy. 79 patients (35.42%) received massive transfusion , 9 patients (4.03%) account for pulmonary edema, 19 cases (8.52%) accounted for mutiorgan failure, 11 cases(4.93%) accounted for ARDS.

Table 11: Perinatal morbidity indicators (n=115)

Indicators	Number	%
NICU admission	30	26.09
Prematurity	75	65.22
Jaundice	35	30.43
Septecimia	4	3.48
No morbidity	15	13.04

Out of 115 cases 15(13.04%) delivered healthy babies. NICU admission was indicated for 30 (26.09%) babies. Seventy-five (65.22%) babies were premature, 35 (30.43%) babies suffered from jaundice and 4(3.48%) babies suffered from septicemia.

Discussion

Prevalence

The prevalence of severe obstetric haemorrhage was 3.4 %. In this study measurement was based on visual estimation of blood loss. The prevalence is comparatively higher in developing countries as compared to developed countries.[8] In our study the prevalence may be due to the study place is a tertiary care hospital getting heavy referrals. According to Al-Zirqi, S Vangen, L Forsen *et al*, the prevalence of severe obstetric haemorrhage was 1.7% which might be at least partly due to differing definitions and recording practices.[9]

V Brace *et al*[10] found an incidence of major obstetric hemorrhage of 3.7 per 1000 births; other investigators have reported incidences ranging

from 1 to 13.3 per 1000 births, depending on the definition used. Stones *et al*[11] defined life-threatening obstetric hemorrhage as a blood loss exceeding 2000 ml and reported a rate of 3.2 per 1000 deliveries, not dissimilar to our own. Waterstone *et al*[12] studied major obstetric hemorrhage in a delivery population approximately the same size as Scotland and reported a rate of 6.7 per 1000 deliveries; however, their threshold for inclusion was lower than ours.

Antenatal care

The booking status is important contributing factor for hemorrhage. As 85.2% 0f the patients in study were unbooked, it contributed the high prevalence rate & antenatal care. The current level of antenatal care in our country is 43.8% (WHO 1999)[13] which is more than twice the level than in our study, which is 14.7%. This reflects the very poor standard of obstetric care of our expectant mother in our catchment area.

Age wise distribution of cases

The significant increase in hemorrhage with age above 25 years emphasizes the importance of not deferring pregnancy to older age.[14] This high incidence attributed to age may be due to increased parity, placenta previa, abruption placenta, uterine atony and increased incidence of cesarean section. The mean age in this study was 25.5 ±4.14 , most common age group was 21 to 25 which accounts to 49.56% which was comparable to Al-Zirqi et al (37.8%).[9] This shows that at risk approach for better utilization of scare resources is not rational and each pregnancy whether teen or otherwise has to be considered important, as maternal complications cannot be predicted with reasonable and emergency obstetric care (EMOC) should be made available to all pregnancy women at all times, since child birth can take place at any time, and also complications can occur at any time as observed by Rajesh Kumar (2002).[15]

Parity wise distribution of cases

A large proportion of the patients (62%) were multipara which was comparable to Al-Zirqi *et al*.[9] It was seen that occurrence of postpartum hemorrhage increased with increasing parity. This was comparable with the other study of Limaye *et al*.[16]

Hemodynamic stability on admission

In our study 40.86% cases were hemodynamically unstable which was more compared to Limaye *et al*[16], (18.8%) patients were in hemodynamically unstable condition probably due to high number of referrals & delay in referral in irreversible state.

Cause wise distribution of cases

Most common cause of obstetric haemorrhage in this study was uterine atonic pph which contributed to 33.91% comparable to Al-Zirqi, *et al* which was 30%.[9] In India (WHO 2004) the 2004 incidence of PPH was 3.2/1000 live births & in 2005 4.5/1000 live births.[17] In our study genital tract trauma 4.34%, coagulopathy 5.21% ,9.4% uterine rupture & according to Mark Waterstone et al, 5.9% of severe sepsis, and 4.4% of uterine rupture.[12]

Risk factors

Most common among medical disorders (cardiac diseases, hypertension, diabeties, sickle cell disease, & coagulopathy) was hypertension (40.9%), while Mark Waterstone, et al has 46.8% of the combined hypertensive conditions.[12] Cardiac disease were 9.09% comparable with Al-Zirqi *et al*[9] which was 5.2%. Among pregnancy related risk factors for obstetric haemorrhage commonest was Anemia (41.73%) in this study, among these 41.73% anemia cases, Others being pregnancy induced hypertension (25.19%), previous cesserian section (18.11%), HELLP (7.08%) , multiple pregnancy (5.51%), and GDM (2.36%). According to Al-Zirqi *et al*[9] anemia 50%, previous cesserian section 5.4%, HELLP 2.8% ans multiple pregnancy 2.1%.

In this study 55.65% were delivered by emergency cesarean section which comparable to Al-Zirqi *et al*[9] which was 60% Delivery by emergency CS carries the highest risk for severe obstetric hemorrhage.[11]

Morbidity indicators associated with sever obstetric haemorrhage in this study were sepsis 8.95%, acute renal failure (ARF) 8.52%, dialysis 3.13%, devascularisation 9.41%, &. 35.42% recived massive transfusion , pulmonary edema 4.3%, multi organ failure 8.52%, ARDS 4.93%. and according Al-Zirqi, *et al*[9] sepsis 2.4%, ARF 5.7%.

Abdrabbo SA *et al*[18] has reported that step wise uterine devascularization which include unilateral uterine vessel ligation (Step I), contralateral uterine ligation (Step II), lower bilateral uterine vessel ligation (Step III) Unilateral ovarian vessel ligation (Step IV) bilateral ovarian ligation (Step V). He had observed that step 1 and 2 are effective in over 80% of the cases, he also mentioned that this technique can be followed by normal menstruation and pregnancy.

Major postpartum blood loss in hemodynamically unstable patients is more likely to need hysterectomy that can be one of the most dangerous procedures. Hysterectomy rate in this study is 10.31% which corresponding with Drife J *et al*.[19]

Maternal & Perinatal Outcome

In India, according to the 2006 National Family Health Survey The single most common cause of maternal mortality is obstetric haemorrhage, generally occurring postpartum and accounting for 25 to 33% of all maternal deaths.[20]

Mortality in this study was 21.73% and morbidity was 78.26%. According to Mark Waterson *et al*[12] incidence of severe obstetric morbidity was 12/1000 deliveries, with morbidity: mortality ratio of 118:1.

Neeru Gupta[21] in her series found that the obstetric hemorrhage constituted 30% of maternal mortality in our country, which is correlating with study where maternal mortality due to hemorrhage is 21.73%.

Perinatal mortality includes both late fetal deaths (still births) and early neonatal deaths. In this study perinatal mortality was 27.82% and morbidity was 59.13%. This is similar to the study of Anjali A Kamal *et al*[22] who had perinatal mortality of 26.9%. Limaye *et al*[16] in his series also had perinata mortality of 28.3%. Perinatal morbidity indicators were NICU admission 26.09%, prematurity 65.22%, jaundice 30.43%, septecima 3.48%.

Conclusion

The prevalence of severe obstetric haemorrhage was 0.9 %. The frequency and impact of severe hemorrhage can be effectively reduced by reducing avoidable risk factors, especially those related to obstetric interventions as increased CS 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. The result of the

study indicate that severe obstetric haemorrhage can be used as an indicator to the assess the level of obstetric care. By identifying the risk factors of severe obstetrical haemorrhage, preventive measures can be taken to avoid feto maternal morbidity & mortality.

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