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Study of etiopathology and risk factors of postpartum haemorrhage in a tertiary care center

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DOI: https://doi.org/10.33545/gynae.2019.v3.i2b.12

Abstract
Background: Postpartum haemorrhage (PPH) is one of the most common causes of maternal morbidity and mortality throughout the world. PPH significantly leads to anaemia, infection, lactional failure, blood transfusion and psychological morbidity. Pregnancy and childbirth involves significant health risks, even to women with no preexisting health problem. The objective of this study was to analyse different causes and risk factors for postpartum haemorrhage.
Methods: This prospective observational study was conducted in the department of Obstetrics and Gynecology of Padmashree Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune India. A total number of 80 cases of PPH that fulfilled the selection criteria were included.
Results: In the current study we found the PPH was common between 25 – 28 years of age, mean gestational age of the 36.5 ± 3.4 weeks and of higher parity. Preeclampsia (35%) followed by Prolonged labour (26.3) were important risk factors for PPH.
Conclusions: Increase in PPH may result in significant maternal morbidity as well as mortality. Early identification of risk factors, causes and implementation of prevention strategies should be mainstay of management in all labour patients. Active management of third stage of labour is highly recommended in all cases.

Keywords: PPH, Preeclampsia, Prolonged labour, multiparty

Introduction

Postpartum haemorrhage is defined as more than 500 ml blood loss within 24 hours following vaginal delivery and 1000ml following caesarean delivery [1]. It is one of the most common causes of maternal morbidity and mortality throughout the world. PPH significantly leads to anaemia, infection, lactional failure, blood transfusion and psychological morbidity. It is a life threatening situation and an obstetrician's nightmare. It is an important issue in the developing world. About 12-13% of all deliveries may result in PPH with a blood loss of more than one litre while life- threatening haemorrhage occurs in 1 in 1000 deliveries [2, 3].

Worldwide it is responsible for 127,000 deaths annually. PPH is one of the leading causes of maternal mortality in Africa and Asia [4]. Hence, the risk of woman dying due to pregnancy or childbirth in her lifetime is about one in six in the developing countries as compared to 1:30,000 in Northern Europe5 and 1:3,700 in United States of America [6].

One of the ways to prevent PPH is Active management of the third stage of labor (AMTSL). It is considered to be the "gold standard" to reduce the incidence of PPH. It combines nondrug interventions with administration of uterotonic drugs [3, 7].

It is a combination of
a. Uterotonic administration (preferably Oxytocin) immediately upon delivery of baby,
b. Early cord clamping and cutting, and
c. Gentle cord traction with uterine counter traction when the uterus is well contracted (Brandt-Andrews maneuver).

Active management of third stage of labour is a feasible, low cost measure to prevent 60-70% of atonic PPH. With this background, objectives of this research are to study overall incidence, different causes and risk factors, among patients with postpartum haemorrhage [8, 9].

Aims and Objectives
▪ To analyse different causes and risk factors for postpartum haemorrhage (PPH).

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- To study etiopathology of PPH

Materials and Methods
The present observational study was conducted on all eligible cases of postpartum hemorrhage admitted in Dept. of Obstetrics and Gynecology of Padmashree Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune. The period of data collection was spread over 2 yrears from july 2016 to june 2018.

Inclusion criteria
1. Patients with estimated blood loss more than500 ml after vaginal delivery and more than 1000ml after caesarean delivery.
2. Patients with excessive bleeding that makes the patient symptomatic (eg. Lightheadedness, vertigo, syncope) and/or results in signs of hypovolemia (eg, hypotension, tachycardia or oliguria)
3. Patients with 10 percent decline in postpartum Haemoglobin concentration from prepartum levels.

Exclusion criteria
1. Women who are too sick to give consent or to be interviewed.
2. Patient unwilling to participate in the study.

The questionnaire included the information regarding age, gestational age, parity, history of abortions, prior obstetric history, co-morbidity and addiction. It also included information regarding amount of blood loss, risk factors, mode of delivery, birth weight of child, causes of PPH, blood transfusion, management of PPH and maternal morbidity. After collection of data, the data entry forms were checked for their completeness and missing and incomprehensible data was rechecked from the respective participant profile.
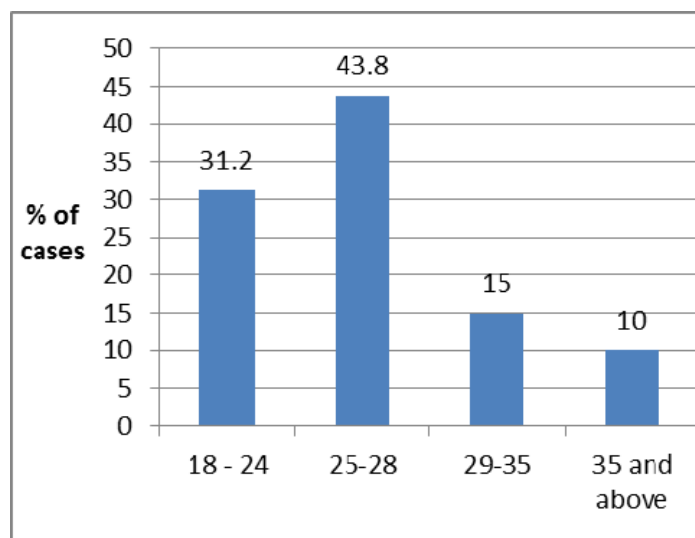
Results

Fig 1: Distribution of cases according to age

It was observed that 25 (31.2) participants were between 18 – 24 years of age, 35 (43.8) participants were between 25 – 28 years of age, 12 (15.0) participants were between 29 – 35 years of age and 8 (10.0) participants were above 35 years of age.
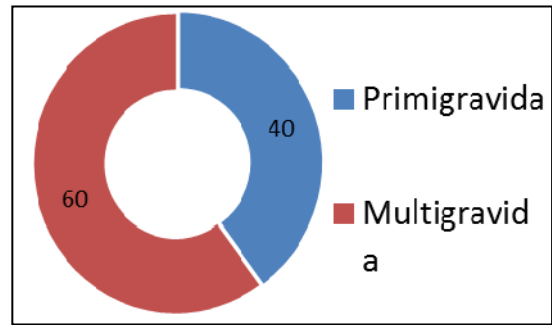

Fig 2: Distribution of cases according to parity Above fig shows the most of PPH cases were multigravida.

Table 1: Distribution of cases according to Gestational age

Gestational age (weeks)	Frequency	Percent
34-<36	16	20.0
36-<38	28	35.0
38-<40	30	37.5
>40	6	7.5
Total	80	100.0

The mean gestational age 36.5 ± 3.4 weeks.

Table 2: Distribution according to co-morbidity (multiple co-morbidities possible)

Co-morbidity	Frequency	Percent
Diabetes Mellitus	12	15.0
Hypertension	30	37.5
Anemia	20	25.0
No significant co-morbidity	34	42.5

It was observed that 12 (15.0) cases had diabetes mellitus, 30 (37.5) cases had hypertension, 20 (25.0) cases had Anemia and 34 (42.5) cases had no significant co-morbidity.

Table 3: Distribution according to Addiction

Addiction	Frequency	Percent
Chewable Tobacco	7	8.7
Alcohol	2	2.5
Drugs	0	0
No Addiction	71	88.8
Total	80	100.0

In our study, addiction was not much common among PPH cases and same as in Indian women population.

Table 4: Distribution of cases according to Risk factors

Risk factors	Frequency	Percent
PIH/Preeclampsia	28	35.0
Prolonged labour	21	26.3
Previous LSCS	14	17.5
Large for gestational age	8	10.0
Twin pregnancy	5	6.3
APH/IUD	4	5.0
Total	80	100.0

In our study we observed that 28 (35.0) cases had PIH/Preeclampsia, 21 (26.3) cases had Prolonged labour, 14 (17.5) cases had previous LSCS, 8 (10.0) cases had Large for gestational age, 5 (6.3) cases had Twin pregnancy and 4 (5.0) cases had APH/IUD.

Table 5: Distribution of cases according to Mode of delivery

Mode of delivery	Frequency	Percentage
Vaginal delivery	36	45.0
Instrumental delivery	16	20.0
-forceps	6	7.5
-vacuum	10	12.5
LSCS	28	35.0
-emergency	18	22.5
-elective	10	12.5
Total	80	100

Above table shows the distribution of participants according to mode of delivery. It was seen that 36 (45.0) cases had vaginal delivery, 16 (20.0) cases had instrumental delivery and 28 (35.0) cases had LSCS while among the LSCS cases, 18 (22.5) cases had emergency LSCS and 10 (12.5) cases had elective LSCS.
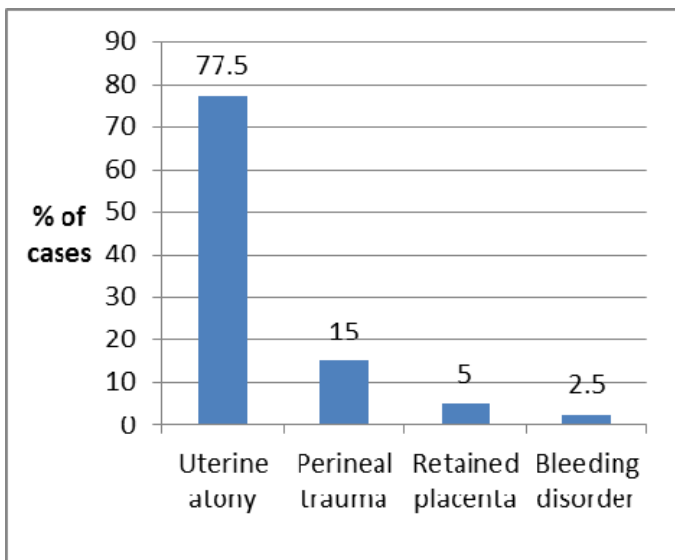
Table 6: Distribution of cases according to birth weight of neonate

Birth weight	No.	Percent
1.5 - <2 kg	4	5.0
2 - <2.5 kg	28	35.0
2.5 - <3 kg	36	45.0
3 - <3.5 kg	8	10.0
More than 3.5 kg	4	5.0
Total	80	100.0

Table 7: Causes of PPH

Causes of PPH	Frequency	Percent
Uterine atony	62	77.5
Perineal trauma	12	15.0
Retained placenta	4	5.0
Bleeding disorder	2	2.5
Total	80	100.0

It was observed that 62 (77.5) cases had Uterine atony, 12 (15.0) cases had Perineal trauma, 4 (5.0) cases had Retained placenta and 2 (2.5) cases had Bleeding disorder.

Fig 3: Distribution of cases according to Causes of PPH

Discussion

PPH remains a major cause of both maternal mortality and morbidity worldwide more so in developing countries with an estimated mortality rate of 140,000 per year or one maternal death every four minutes. PPH occur in 4-5% of all deliveries, majorities of death occur within four hours of delivery indicating that it is a consequence of third stage of labour. [3,9]

The four important causes of PPH are atony, trauma, retained placenta or adherent placenta and coagulation abnormalities In the present study the mean age of the participants was 26.4 ± 7.4 years.

The study of Solwayo Ngwenya [10] and study of Sam Ononge *et al.* [11] observed that the mean age of the participants with PPH was 27.7 ± 6.9 years and 24.4 ± 6 years respectively.

In the study conducted by Sam Ononge *et al.*, [11] it was observed that 17 (20.7) participants were between ≤19 years of age, 58 (70.7) participants were between 20 – 34 years of age and 7 (8.5) participants were ≥35 years of age.

In our study, 32 (40.0) cases were of primigravida and 48 (60.0) cases were of multigravida .The study of Nakagawa *et al.*, [12] observed that most of the cases were primigravida (60.6) While two more studies Sam Ononge *et al.*,[11] and Gregory Edie Halle-Ekane *et al.*, [13] were noted consistent findings with our study .

In the present study the mean gestational age of the participants was 36.5 ± 3.4 weeks.

Solwayo Ngwenya *et al.*, [10] found that the mean gestational age of the participants was 38.6 ± 2.2 weeks and by Nakagawa *et al.*, [12] the mean gestational age of the participants was 39.9 (36.6 – 1.9).

In the present study, it was observed that 28 (35.0) participants had blood loss between 500 – 999 ml, 37 (46.2) participants had blood loss between 1000 – 1499 ml, 12 (15.0) participants had blood loss between 1500 – 1999 ml and 3 (3.8) participants had blood loss between 2000 – 2499 ml. Similar findings were reported by many observational studies [12, 13].

In this study, it was observed that 12 (15.0) cases had diabetes mellitus, 30 (37.5) cases had hypertension, 20 (25.0) cases had Anemia and 34 (42.5) cases had no significant co-morbidity.

Chandrika S. Kodla *et al.*, [14] found that 2 (9.0) cases had diabetes mellitus, 9 (40.9) cases had hypertension, 2 (9.0) cases had cardiac diseases and 6 (27.7) cases had Sickle cell disease.

In the study of Gregory Edie Halle-Ekane *et al.*, [13] there was no significant relation.

In the present study, it was observed that 28 (35.0) cases had PIH/Preeclampsia, 21 (26.3) cases had Prolonged labour, 14 (17.5) cases had previous LSCS, 8 (10.0) cases had Large for gestational age, 5 (6.3) cases had Twin pregnancy and 4 (5.0) cases had APH/IUD. Similar findings were reported by Solwayo Ngwenya *et al.* [10] Chandrika S. Kodla *et al.* [14].

In the study conducted by Solwayo Ngwenya *et al.*, [10] it was seen that 56 (75.7) cases had vaginal delivery and 18 (24.3) cases had LSCS and by Sam Ononge *et al.*, [11] it was seen that 82 (76.6) cases had vaginal delivery and 25 (23.4) cases had LSCS. Findings of these studies were consistent with our study.

In the present study it was observed that 4 (5.0) participants had birth weight between 1.5 – 2 kg, 28 (35.0) participants had birth weight between 2 – 2.5 kg, 36 (45.0) participants had birth weight between 2.5 – 3.0 kg, 8 (10.0) participants had birth weight between 3.0 – 3.5 kg, 4 (5.0) participants had birth weight more than 3.5 kg. A study was conducted by Nakagawa *et al.* [12], and they found that the mean birth weight of neonates was 3040 (1642 - 4220) grams and by Sam Ononge *et al.*, [10] macrosomia of birth weight more than 4000 grams was seen in 15 (14.0) cases.

In the present study, it was observed that 62 (77.5) cases had Uterine atony, 12 (15.0) cases had Perineal trauma, 4 (5.0) cases had Retained placenta and 2 (2.5) cases had Bleeding disorder.

While studies of Solwayo Ngwenya *et al.*, [10] and Chandrika S. Kodla *et al.*, [14] observed similar findings.

Conclusion

From the results of our study, we conclude that PIH/Preeclampsia was the most common risk factor followed by prolonged labour and previous LSCS. These three risk factors together contributed to 75% of the post-partum hemorrhage cases.

Uterine atony followed perineal trauma were the most common causes of PPH. Together they form 90% of the causes of PPH. Blood transfusion was required in 55% of the cases followed by platelet transfusion in 7.5% cases and FFP in 5% cases. Early identification of risk factors, causes and implementation of prevention strategies should be mainstay of management in all labour patients. Active management of third stage of labour is highly recommended in all cases. It is important and crucial to prevent morbidity and mortality.

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