Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Obstetrics and Gynecology Research

Journal homepage: www.ijogr.org

Original Research Article

Postpartum hemorrhage -- clinical profile and referral patterns in a tertiary care teaching institution in south Kerala, India

Lisha Lakshman[1], Adma Harshan[2], Heera Trivikrama Shenoy[3*], Ranjana B[1], Simi Jameela[2]

[1]Dept. of Obstetrics and Gynecology, Malabar Medical College Hospital and Research Centre, Modakkallur, Kerala, India
[2]Dept. of Obstetrics and Gynecology, Government Medical College, Thiruvananthapuram, Kerala, India
[3]Dept. of Obstetrics and Gynecology, Azeezia Medical College Hospital, Adichanalloor, Kerala, India

Abstract

Aim and Objective: The aim of the present study was to review the maternal records of cases of PPH and to evaluate the clinical profile, risk factors & referral patterns associated with PPH at our tertiary care centre

Materials and Methods: A hospital record based retrospective study was conducted in obstetrics & gynecology department, Government Medical college Thiruvananthapuram & women who gave birth after 28 weeks of gestation who had PPH after normal vaginal delivery or caesarean between January 2019 and January 2021 were the participants.

Results: In the present study 31.9% with PPH were from 26- 30yrs. Majority (58%) of the study population were booked cases and 67.2% of study participants had regular antenatal visits. 78.1% of the referred cases had received proper initial emergency management of PPH before referring to tertiary centre, which might be attributed to introduction of regular training programmes of KFOG like EMOCALS workshop, ORRT, MDNMSR. Anaemia (34.4%) and GHTN (20.1%) were the common risk factors among pph patients. Out of 119, 55% had minor PPH. Atonic PPH was the major cause of PPH (52.5%) followed by traumatic PPH (30.8%) which in majority were managed medically Near- miss were 21% and 3.4% of mothers succumbed to death.

Conclusion: Post-partum haemorrhage is a leading cause of maternal mortality and morbidity especially in developing countries. Correcting the avoidable risk factors, active management of 3rd stage of labour and promote institutional deliveries are key steps in preventing PPH. Timely referral, regular training of the health care workers to tackle obstetric emergencies is crucial and mandatory to reduce the maternal mortality due to obstetric haemorrhage.

Keywords: PPH, Maternal mortality, Obstetric referral, Blood transfusion, atonic, Hypertension, traumatic, Clinical profile.

Received: 10-05-2024; **Accepted:** 24-12-2024; **Available Online**: 13-08-2025

1. Introduction

Worldwide about half a million women die as results of complications of pregnancy and child -birth. Nearly all (99%) of these deaths were in the low and middle- income countries Hemorrhage, usually occuring in the postpartum period, was responsible for between one quarter and one third of obstetric deaths. According to the World health organization, obstetric hemorrhage causes 127,000 deaths annually worldwide and is the leading cause of maternal mortality. The risk of dying from PPH depends not only on the amount and the rate of blood loss but also the health status of the woman. A major reason why many patients die from hemorrhage was because once bleeding starts, death could occur in around 2 hours compared to 10 hours for eclampsia and 72 hours for obstructed labor.

PPH is a frequent complication of delivery and its incidence is commonly reported as 2% - 4% after vaginal delivery and 6% after cesarean section with uterine atony being the cause in about 50% cases. PPH remains the number one killer of mothers and accounts 28% of all maternal deaths in developing countries while in high income countries it accounts about 13% of maternal deaths. There is an increase risk in the PPH due to number of changes in recent years in obstetric practice and maternal demographics; these include

*Corresponding author: Heera Trivikrama Shenoy
Email: ranjanableo91@gmail.com

https://doi.org/10.18231/j.ijogr.v.12.i.3.11

increase in the rate of cesarean delivery, a larger proportion of multiple gestation births, and more pregnant women of advanced maternal age.

PPH is a significant public health threat in developing nation like India contributing to perinatal and maternal mortality and morbidity. Hence the aim of my study is to review the maternal records of cases of PPH and to evaluate the Clinical profile and risk factors associated with it at our tertiary care centre, so that we can take prompt measures to prevent it and keep ourselves ready to tackle expected PPH.

2. Aims & Objectives

1. To study the Clinical profile of Postpartum hemorrhage cases admitted in Obstetrics and gynaecology department of Government Medical College Thiruvananthapuram between January 2019 and January 2021
2. To estimate the proportion of referred cases who have received initial management for post-partum haemorrhage from the periphery admitted in Obstetrics and gynaecology department of Government Medical College Thiruvananthapuram between January 2019 and January 2021.

3. Materials and Methods

3.1. Study design

Record based retrospective study.

3.2. Study setting

Government Medical College Thiruvananthapuram.

3.3. Study population

Women who gave birth after 28 weeks of gestation between January 2019 and January 2021.

3.4. Inclusion criteria

1. Women admitted at government Medical college Thiruvananthapuram hospital who gave birth after 28 weeks of gestation between January 2019 and January 2021 and had PPH after normal vaginal delivery or caesarean.

3.5. Exclusion criteria

1. Absence of key information in medical records.

3.6. Study period

18 months after obtaining IEC clearance.

3.7. Sample size

All cases that met the eligibility criteria collected from the medical records.

3.8. Sampling technique

Samples were selected consecutively from the medical records

3.9. Study procedure

After obtaining ethical clearance, information of patients with PPH admitted in Government medical college, Thiruvananthapuram was collected from Medical records. Those who met the eligibility criteria were included in the study.

Data was collected using a structured proforma. Data of the patients included in the study were evaluated. Information on maternal health before and during pregnancy, detailed information about delivery and complications occurring intrapartum or postpartum was collected Volume of PPH, transfusion information, modes of delivery and various candidate risk factors were recorded. In addition to clinical typing, lab indices of all the patients were also collected.

3.10. Study variables

1. Sociodemographic variable – Age of delivery, Level of education, socioeconomic status, occupation
2. History of caesarean delivery
3. Parity
4. BMI before pregnancy
5. Booked or not
6. Referred cases
    a. Details regarding the Initial management of PPH done at the peripheral institution prior to the referral
    b. Whether referring centre was informed prior.
7. Previous history of PPH
8. Pregestational – medical disease prior to pregnancy
9. Pregnancy related variables
    a. Regular or irregular prenatal examination
    b. singleton or twin pregnancy
    c. HELLP syndrome
    d. Pregestational diabetes
    e. GDM
    f. Chronic hypertension, Gestational Hypertension
    g. Fibroids
    h. Anaemia, thrombocytopenia, blood coagulation disorder
    i. Placenta previa, placenta abruption, placenta accrete spectrum
    j. Polyhydramnios
    k. Macrosomia
10. Labor related obstetric variables
    a. Induction of labor
    b. Precipitate labor
    c. Prolonged labor
    d. Mode of delivery

11. Blood loss – minor, major, massive
12. Lab indices – Blood routine, coagulation profile
13. Patient outcome – mortality, morbidity, Near miss
14. Treatment given

    a. Medical, mechanical, surgical management
    b. Blood transfusion given or not

3.11. Data collection tool

Data was collected using a structured proforma.

3.12. Data analysis

Data was entered into Excel and analysed using SPSS version 26 categorical variables were expressed as percentage and frequency. Continuous variables were expressed as mean and standard deviation.

3.13. Ethical considerations

1. Study was initiated after obtaining human Ethics Committee clearance.

4. Results

The study included 119 participants who met the eligibility criteria

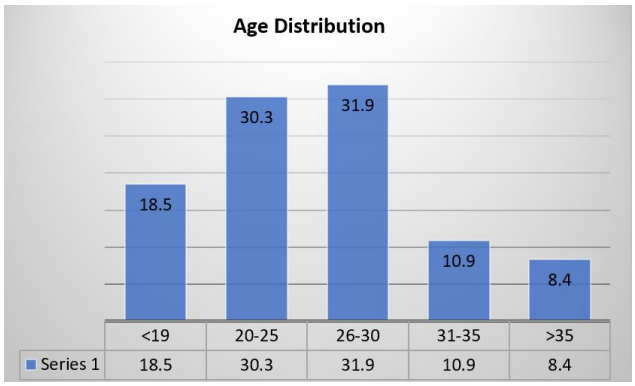

Figure 1: Age wise distribution of study participants

Figure 1, it was seen that majority of PPH cases belongs to 26-30 age category (31.9%) and was comparable to the age pattern of women who delivered in this institution.

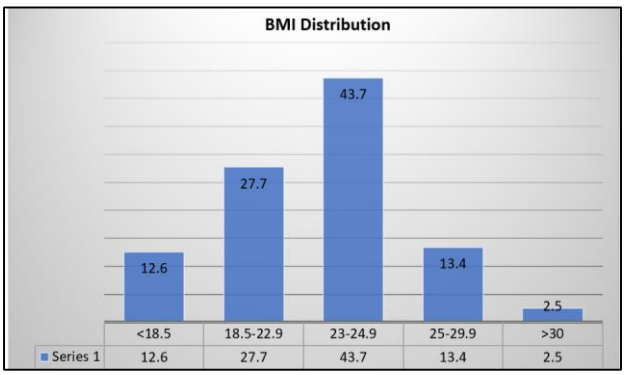

Figure 2: Distribution of BMI

That majority of PPH cases had BMI between 23- 24.9, that is 43.7%. 13% of PPH cases comes under overweight category (BMI: 25-29.9) and only 2.5% cases comes under obesity category (BMI : >30).

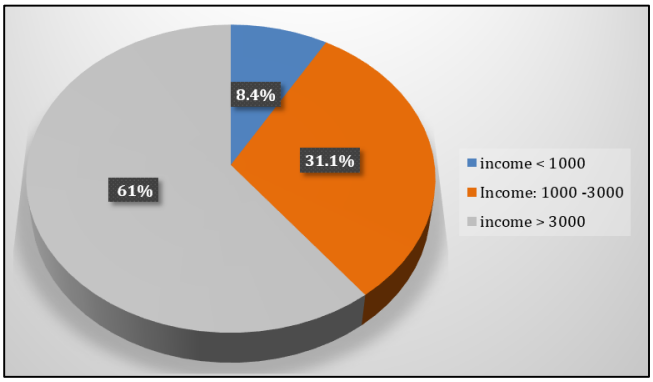

Figure 3: Distribution of monthly income among study participants

Figure 3 shows the analysis of near miss cases according to the monthly income. 61% of them had monthly income exceeding > Rs 3000. 31.1% had a monthly income between Rs 1000 to 3000. 8.4% had monthly income of < Rs 1000.

This **Figure 4** shows the booking status of the PPH cases.as we can see 58%were booked at SATH and 21.8% were booked outside. 20.2% had no prior ANC.

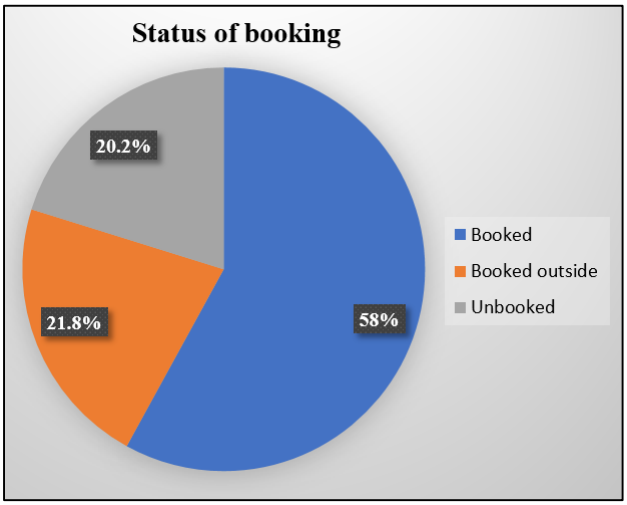

Figure 4: Distribution according to booking status

Figure 5 shows that the majority of PPH cases were from rural areas (62.18%) while the rest of them were i.e. 40.8% from the urban areas.

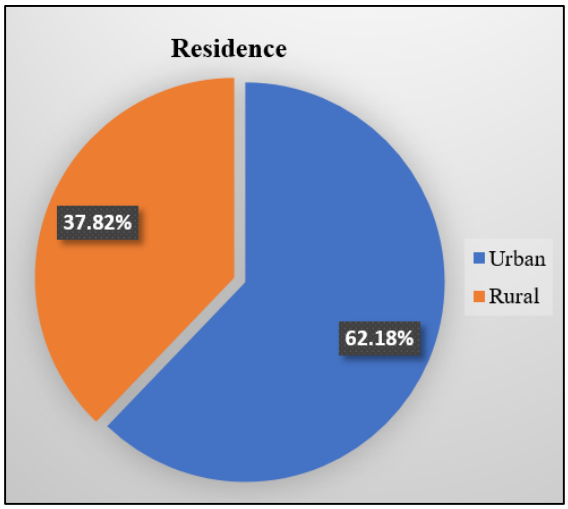

Figure 5: Place of residence among study participants

Figure 6 shows the distribution of study population based on referral pattern. Out of 119 total study participants 53.7% were referred cases and 46.2% cases were not referred out of which 69 PPH cases were booked cases.

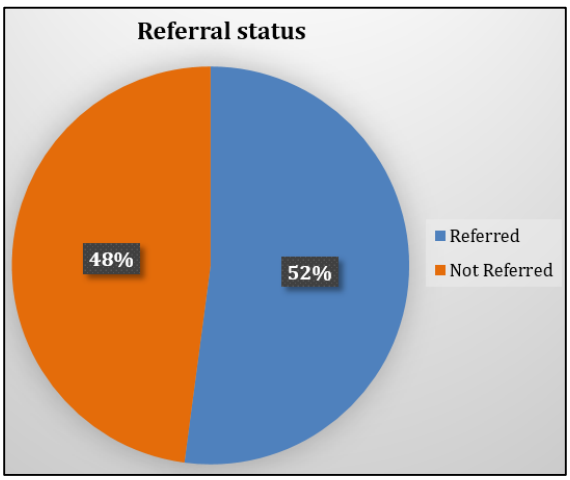

Figure 6: Distribution according to refferal pattern

Referral patterns: Of the 119 PPH cases admitted in SATH, 64 cases were referred and of that 67 percent was timely references. High risk cases like previous history of PPH, placenta previa, placenta accrete spectrum were identified earlier and were referred at or before 32 weeks.

Out of 64 cases that have been referred to SATH hospital with PPH, 45 (70.3%) cases had proper referral letter briefing the initial management and steps taken to tackle excessive blood loss during PPH.

Out of 64 referred cases 50 i.e. 78.1% of PPH cases received initial management from peripheral institution prior to reference which significantly helped in reducing the maternal mortality due to PPH. And only 21.9% did not receive the initial management. The reason behind this being frequent training of the obstetricians all over Kerala on tackling obstetric emergencies in order to reduce maternal mortality rates in our state. The various programs implemented by Kerala Federation of Obstetrics and Gynaecology (KFOG) included EMOCALS (Emergency Obstetric Care And Life Support) workshops, ORRT (Obstetric Rapid Response Team), MDNMSR (Maternal Death Near Miss Surveillance). The referral pattern of PPH cases admitted in SATH. majority are as follows ie 32.8% of cases were referred from community health centres, followed by Private hospitals that accounts for 17.2% of referred cases which might be mainly due to financial constraints of the patients.

Table 1: Distribution according to medical morbidity

	Frequency	Percent
Previous h/o PPH	18	15.1%
Medical disorders		
Heart disease	3	2.5%
Diabetes mellitus	12	10%
HTN	17	14.2%
Respiratory disease	1	0.8%
Epilepsy	4	3.36%
Psychiatric illness	2	1.7%
Nil	82	68.9%

Table 1 shows the medical disorders among the study population, majority ie 68.9% had no medical disorder.

Out of 119 study population with PPH only 15.1% had previous history of PPH, whereas 84.9% had no such previous history.

Table 2: Distribution based on pregnancy related complications

	Frequency	Percent
Nil	41	34.4
GHTN	24	20.1
Preeclampsia	11	9.2
HELLP	1	0.8
Anemia	27	22.6
Thrombocytopenia	4	3.3
Blood coagulation disorder	4	3.3
Fibroid complicating	9	7.5
GDM	23	19.3

Table 2 shows the pattern of pregnancy related complication in our study population, and among that most common complication was anemia i.e. 22.6% followed by GHTN i.e. 20.1%.

Table 3: Distribution based on obstetric complications

	Frequency	Percent
Previous CS	20	16.8
Previous 2 CS	2	1.68
Placenta previa	3	2.52
Polyhydramnios	12	10.08
Adherent placenta	2	1.68

Table 3 most of PPH patients admitted at SATH were previous CS cases i.e. 16.8% and polyhydramnios was seen in 10.08% which is a major risk factors for PPH, adherent placenta were seen in two cases and we had to proceed with obstetric hysterectomy in order to control bleeding.

Table 4: Distribution based on labour related obstetric variables- type of labour

Category	Frequency	Percentage
Hysterotomy	1	0.8
Induced labour	28	23.5
Instrumental delivery	7	5.9
LSCS	35	29.5
Spontaneous vaginal delivery	48	40.3
Total	119	100

Table 4 illustrated the type of labour in all the PPH cases been admitted in SATH, majority of cases ie 40.3% had undergone spontaneous vaginal delivery. 29.5% LSCS cases had PPH, 23.5% induced delivery and 5.9% instrumental deliveries had out of 119 PPH cases admitted in SATH only 7.6% of cases had history of precipitate labour.

Table 5: Distribution of study population based on amount of blood loss and PPH types

500 – 1 L (minor)	66	55
1 – 1.5 L (major)	41	34.2
> 1.5 L (massive)	13	10.8

Table 5 illustrates distribution of PPH cases based on amount of blood loss. Majority of PPH cases had minor blood loss ie 55%, followed by major ie 34.2%, and proportion of massive amount of blood loss was 10.8%. Blood loss was calculated from the documented evidence (notes as well as direct communication) of the primary hospital of care where she was treated.

Table 6: Distribution of study population based on cause of PPH

	Frequency	Percentage
Need for blood transfusion	85	-------
Atonic PPH	63	52.5
Traumatic PPH	37	30.8
Combined (atonic+ traumatic)	10	8.3
Retained placenta	9	7.5
Coagulopathy	8	6.7

Table 6 depicts the requirement of blood and blood products in management of PPH cases at our tertiary care centre. And it was found that 71.4% of all the PPH cases received blood transfusion. The decision for blood transfusion was made by assessing patients clinical status like presence of pallor, tachycardia, hypotension and also by assessing the amount of blood loss ie whether the PPH was minor, major or massive Majority of PPH cases had minor blood loss ie 55%, followed by major ie 34.2%, and proportion of massive amount of blood loss was 10.8%.

Table 7: Type of management

	Frequency
Medical management	53
Repair of perineal/vaginal tear	43
Manual removal of placenta	9
B-lynch sutures	7
Balloon tamponade	17
Stepwise devascularisation	14
Caesarean hysterectomy	12
Devascularisation+ balloon tamponade	1
Internal iliac ligation	1

Table 8: Maternal morbidity

	Frequency
Nil	85
Near miss	25
Sepsis	14
DIC	13
Renal failure	6
Obstetric hysterectomy	12

5. Discussion

Worldwide, more than 500,000 women die each year from complications of pregnancy and childbirth, with 99% of deaths taking place in developing countries.[1] About 24% of maternal deaths occur during pregnancy, 16% during labor and birth, and 61% occur during the postpartum period.

Forty-five percent of deaths occur within the first 24 hours of birth, mostly as a result of postpartum hemorrhage due to uterine atony and/or retained products of conception.[2] More so than the other major obstetric complications, the response time for hemorrhage is limited. The estimated average interval from onset of bleeding to death ranges from only 2 hours for postpartum hemorrhage to 12 hours or antepartum hemorrhage.[3] Cause and timing of death are relevant because almost half of the women in developing countries give birth at home assisted by an unskilled attendant; this proportion is higher for rural, underserved areas.[4] Women and unskilled attendants are usually not equipped to handle obstetric emergencies, yet referral rates for emergency obstetric care are typically low.[5]

A framework that has guided safe motherhood programming and research for the last 15 years is the Delay Model, which proposes that delay may occur at 3 different points in time: 1) the decision to seek care (sometimes broken problem recognition and decision to seek care), 2) reaching care, and 3) receiving emergency obstetric care.[6-8]

These are each influenced by a combination of sociocultural, economic, environmental, and health services factors such as perceived and actual quality of care, as well as the existence of multiple options for care. The premise of the framework is that a reduction in the delays will lead to a decrease in mortality.

Kerala has got much better health indices like Maternal Mortality Ratio (MMR) and Infant Mortality Rate (IMR) compared with other states in India. But the question often asked is, whether Kerala has achieved its potential in this regard. We have to consider that MMR of Kerala in early nineties was said to be 87. According to the Millennium Development Goal 5, Kerala's MMR should therefore come down to about 20 by 2015. As per the latest Sample Registration System, (SRS) the MMR of Kerala was 66 (SRS 2010-12). Kerala Federation of Obstetrics & Gynaecology estimates this to be about 50 on the basis of Confidential Review of Maternal Deaths (CRMD). All these figures suggest that there is need for urgent action in reducing maternal deaths in our state.

Our analysis of the situation in Kerala has clearly shown that the steps urgently required are:

1. To increase the competence of the practicing obstetricians and labour room staff in providing emergency obstetric care and basic life support (EMOCALS).
2. To ensure that the quality of obstetric care provided is standardized.

The Kerala Federation of Obstetrics and Gynaecology has been conducting confidential review of maternal deaths since 2004 and the findings of first six years (2004 to 2009) are published in two volumes. The reports have shown that there are many avoidable maternal deaths in Kerala. These are mainly due to postpartum hemorrhage, hypertensive disorders of pregnancy, sepsis, and amniotic fluid embolism. Early detection and prompt care of these problems would have saved many of these lives. If the patient has an acute collapse, life support measures have to be initiated immediately. For this the obstetricians and labour room nurses have to be trained and retrained.

5.1. EMOCALS (D and N) training

The ability to provide emergency care and life support measures is a must for anybody attending a labour and delivery. The Kerala Federation evolved a compact training program called EMOCALS to train obstetricians (EMOCALS-D) and Nurses (EMOCALS _N). The Kerala Health Services and NRHM realized the importance of the training program for the staff in the Health Services and hence the project was launched. It is a joint project of the Kerala Federation of Obstetrics and Gynecology, Kerala Health Services and the National Rural Health Mission (NRHM) Kerala. The urgent need for training the obstetricians and nurses, especially in the peripheral centre was highlighted by the Confidential Review of Maternal Deaths (CRMD).

In the present study the age of the patients ranged from 17 to 45 years, out of them maximum number of the study participants were in the age group of 26-30 years (31.9%) as in Sheikh L et al,[9] Ajenifuja KO et al[10] (48%) while Tondge G et al and Duhan L et al[12] reported 71% and 88% women in 25- 30 years age group.

In the present study, it was reported that majority of pregnant women participated in the study were first time mothers 45(66.2%), followed by Para 2 (27.9%) while 5.9% were grand - multi. Gunavardane et al[1] reported 52.5% multipara and 32% primipara, Tondge et al[11] reported 42% primipara which is similar to our study while Ajenifuja KO et al[10] found contrast results. Duhal L et al[12] found primipara hand in hand with multipara.

In the present study the commonest etiology for PPH was uterine atony which accounts for 52.5% and traumatic PPH in 30.8%, followed by Atony with trauma in 8.3%, Retained placental tissue was seen in 7.5%, Atonic PPH and Coagulopathy in 4.2%, coagulopathy 2.5% of the cases. Sheikh L et al[9] had 54% cases of atonic uterus. Genital tract trauma was reported in 9%, Tongde G et al[11] reported 69% uterine atony and 20% genital tract trauma and Duhan L reported 68% and 23.7% cases respectively. In the study by Ajenifuja retained placenta was the most common cause 48.21%, uterine atony 10.7%, trauma 8% and was attributed this to poor management of 3rd stage of labour.

Use of oxytocics has been associated with 60% decrease in incidence of PPH. Similarly, Henry et al also found retained placental tissue as the commonest etiology.[1]

Our study reveals 58% booked and 21.8% Unbooked cases which was similar to the studies of Dashora et al[14] 30% of unbooked Ajenifuja et al 30.36%, Tongde G 40%. In contrast Duhan L et al reported 72% unbooked cases.[12]

Postpartum haemorrhage was managed by various modalities of treatment. Most of the cases were managed by medical treatment 44.2% followed by Repair of perineal/ vaginal tear 35.8%, which was also observed in the studies of Gunavardane et al[15] 47.5% and Duhan L et al 55%. Caesarean hysterectomy was done in 10% in our study, 2.63% in study of Duhan L et al while Gunavardane et al reported in 21.3% cases.[12,15]

Many complications were associated with postpartum haemorrhage. Our study reveals that 16.8% of participants were cases with previous caesarean section and 10.08% of cases had polyhydramnios, which was also seen in the studies of Gunavardane 18% and 12% and Duhan L et al 26%. The present study reveals that prolonged labour has been seen in 29.4% which was also seen in the studies of Gunavardane et al 34.4% and Duhan L et al 26%. Tongde G et al reported no factor in 65% cases and prolonged labour only in 7.6% cases. Postpartum haemorrhage remains the leading cause of maternal mortality worldwide and also in India. In the present study the mortality among PPH patients 3.4%.[11,12,15]

In the present study 53.7% of total PPH cases were in referrals, out of them 67.5% were timely referred, and 78.1% of them had received initial emergency management from periphery before reaching the tertiary centre, this has significantly reduced the mortality due to PPH.

Replacement of lost blood is of paramount importance in the management of PPH cases. Therefore, blood bank well stocked with blood and blood products that is functioning 24 hours is essential. In the present study blood and blood product transfusion is done in 71.4% of the patients.

6. Conclusion

Post-partum haemorrhage is a leading cause of maternal mortality and morbidity especially in developing countries. Prevention is important and includes identifying and correcting the avoidable risk factors and active management of 3rd stage of labour, promote institutional deliveries, increase awareness, and increase trained health care professionals and all accurate and prompt measures to minimize the blood loss during and after the delivery. Timely referral, regular training of the health care workers to tackle obstetric emergencies is the key to reduce the maternal mortality due to obstetric haemorrhage.

7. Author Contribution

Lisha Lakshman prepared the protocol, collected data, assessed eligibility and methodological quality of studies and wrote the review. Adma Harshan conceived the idea, conducted searches, assessed eligibility and quality of studies. Dr Simi J performed the statistical analysis and Dr Heera Shenoy T supervised the review. Dr Ranjana B provided comments on the manuscript.

8. Source of Funding

None.

9. Conflict of Interest

None declared.

10. Ethical Approval

Ethical no.: 10/33/2021/MCT.

References

1. AbouZahr C, Wardlaw T. Maternal mortality in 2000: Estimates developed by WHO, UNICEF, and UNFPA. Geneva: World Health Organization; 2000.
2. Li XF, Fortney JA, Kotelchuck M, Glover LH. The postpartum period: the key to maternal mortality. *Int J Gynaecol Obstet*. 1996;54(1):1–10.
3. Starrs A, Inter-Agency Group for Safe Motherhood (IAGSM). The safe motherhood action agenda: Priorities for the next decade. Report of the safe motherhood technical consultation, 18–23 October 1997, Colombo, Sri Lanka. New York: Family Care, International and the Inter-Agency Group for Safe Motherhood; 1998.
4. Calvert C, Thomas SL, Ronsmans C, Wagner KS, Adler AJ, Filippi V, et al. Identifying regional variation in the prevalence of postpartum haemorrhage: a systematic review and meta-analysis. *PLoS One*. 2012;7(7):e41114.
5. Jahn A, De Brouwere V. Referral in pregnancy and childbirth: Concepts and strategies. In: De Brouwere V, Lerberghe VW, editors. Safe motherhood strategies: A review of the evidence. Studies in Health Services Organization and Policy. Antwerp, Belgium: ITG Press; 2001. p. 17.
6. Sibley L, Sipe TA, Koblinsky M. Does traditional birth attendant training improve referral of women with obstetric complications: a review of the evidence. *Soc Sci Med*. 2004;59(8):1757–68.
7. McCarthy J, Maine D. A framework for analyzing the determinants of maternal mortality. *Stud Fam Plann*. 1992;23(1):23–33.
8. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med*. 1994;38(8):1091–110.
9. Sheikh L, Najmi N, Khalid U, Saleem T. Evaluation of compliance and outcomes of a management protocol for massive postpartum hemorrhage at a tertiary care hospital in Pakistan. *BMC Pregnancy Childbirth*. 2011 Apr 13;11:28.
10. Ajenifuja KO, Adepiti CA, Ogunniyi SO. Post-partum haemorrhage in a teaching hospital in Nigeria: A 5-year experience. *Afr Health Sci*. 2010;10(1):71–81
11. Tondge G, Burande A. A retrospective study of cases of postpartum haemorrhage at tertiary health care centre. *Indian J Obstet Gynecol Res*. 2018;5(3):322–6
12. Duhan L, Nanda S, Sirohiwal D, Dahiya P, Singhal S, V. A retrospective study of maternal and perinatal outcome in patients of postpartum haemorrhage in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol*. 2017;5(6):1897–901.

13. Henry A, Birch MR, Sullivan EA, Katz S, Wang YA. Primary postpartum haemorrhage in an Australian tertiary hospital: a case-control study. *Aust N Z J Obstet Gynaecol*. 2005;45(3):233–6.
14. Dashora S, Dhanjani K, Soliriya V, Bhatia S, Gupta A. Evaluation of clinical profile of post-partum hemorrhage at a tertiary care center. *Int J Med Sci Educ*. 2019;6(4):105–9.
15. Goonewardene M, de Silva C, Medawala M, Karunarathna S. The occurrence, management and outcomes of post partum haemorrhage in a teaching hospital in Sri Lanka. *Sri Lanka J Obstet Gynaecol*. 2012;34(4):144–54.

Cite this article: Lakshman L, Harshan A, Shenoy HT, Ranjana B, Jameela S. Postpartum hemorrhage -- clinical profile and referral patterns in a tertiary care teaching institution in south Kerala, India. *Indian J Obstet Gynecol Res*. 2025;12(3):419-426.