

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Retrospective Cross-Sectional Study of Prevalence, Causes And Risk Factors For Postpartum Haemorrhage (PPH) At Dr. Vithhalrao Vikhe Patil Foundation's Medical College and Hospital, Ahmednagar, Maharashtra, India.

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ABSTRACT

Postpartum haemorrhage (PPH), a major cause of maternal morbidity and mortality around the world, is more common and has more complex risk factors in India. Investigating the prevalence, causes and risk factors of PPH in Indian women is the goal of this study. An analysis of pregnant women who were more than 28 weeks gestation was done retrospectively. Each patient's detailed clinical history, including the characteristics of the mother, her obstetric history, and information on the maternal and perinatal outcomes were obtained from medical records. 242 (4.23%) of the 5710 pregnant women who were enrolled in the study had PPH. The subgroup analysis showed that for singletons, multiple pregnancies, caesarean sections, and vaginal deliveries respectively, the incidence of PPH was 4.2, 6.34, 4.03, and 4.3%. Placenta previa and placenta accreta were the two most frequent risk factors of PPH in the general population and all subgroups. Independent of the technique of delivery, having multifetal gestation was a risk factor for PPH. In singletons and situations necessitating caesarean sections, and multiparity were potential causes for PPH, but the latter suggested a lower incidence of PPH in vaginal deliveries. PPH incidence was found to be greater in vaginal or singleton deliveries when macrosomia was present. Women who delivered vaginally had a greater risk of PPH when they had preeclampsia. The two main risk factors for PPH were placenta previa and placenta accreta, albeit the risk variables varied significantly depending on the number of fetuses and the method of delivery. In the overall study, A combination of the identified risk factors showed an acceptable prediction result for identifying PPH in singleton pregnancies and in women who delivered baby through caesarean section; however, in twin pregnancies and in women who gave birth vaginally, the performance was only moderate.

Keywords: postpartum hemorrhage, incidence, risk factors, pregnancy, maternal mortality

<https://doi.org/10.33887/rjpbcs/2022.13.5.21>

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INTRODUCTION

Postpartum haemorrhage (PPH), which accounts for about 25% of maternal deaths, is the main cause of maternal mortality worldwide [1, 2]. The American College of Obstetricians and Gynecologists' updated classifications define it as blood loss that exceeds 1,000 mL within 24 hours of delivery, independent of the method of delivery [3]. About 24% of maternal deaths happen during pregnancy, 16% happen during labour and delivery, and 61% happen after delivery. In the first 24 hours after birth, 45 percent of deaths take place, most frequently as a result of postpartum haemorrhage brought on by uterine atony and/or retained placental products [4]. For postpartum haemorrhage, the estimated average time from the start of bleeding to death is only 2 hours, while for antepartum haemorrhage, it is 12 hours [4, 5]. A crucial time in women' life is when they receive proper care during the antenatal, labour, and delivery processes, as well as active management during the third stage of labour. The high prevalence of PPH remains a problem in India despite all the government's efforts, necessitating the introduction of crucial controls. Contrarily, the rate of maternal mortality has decreased recently [6]. Nevertheless, multiple organ failure, several blood transfusions, and peripartum hysterectomy are among the "mother near-misses" that are said to occur for every maternal death from PPH [7]. In order to maximise the effectiveness of the therapies that are currently available to prevent the related maternal fatalities or other bad maternal outcomes, it is necessary to correctly identify women who are at higher risk of PPH. PPH risk factors have been discovered in published studies, including a history of the condition, preeclampsia, extended labour, surgical vaginal deliveries, and caesarean sections [8-14]. Although most large-scale or nationwide research are from western nations, race may also have an impact on the prevalence of PPH [15]. Therefore, this study aims to determine the Prevalence, Causes And Risk Factors For Postpartum Haemorrhage (PPH) At Dr. Vithhalrao Vikhe Patil Foundation's Medical College & Hospital, Ahmednagar (Tertiary Care Centre).

MATERIALS AND METHODS

This study was conducted in Dr. Vithhalrao Vikhe Patil Foundation's Medical College & Hospital, Ahmednagar (tertiary care centre) in dept. of OBGY from Maharashtra State in India, from 1st June 2021 to 31st May 2022. Medical records were used to obtain complete clinical records for each birth, including socio - demographic variables, obstetric history, and maternal and perinatal outcome data. A retrospective Cross-sectional hospital-based study design was conducted by using hospital delivery registry book and Patients medical record files from 1st June 2020 to 31st May 2022 with aim of determining the prevalence, causes and associated factors for postpartum haemorrhage. The Ethical Committee of Dr. Vithhalrao Vikhe Patil Foundation's Medical College & Hospital, Ahmednagar approved the study. Due to the study's retrospective nature, informed consent was not required.

Inclusion criteria

All pregnant women between the ages of 18 and 50 who delivered fetuses after 28 weeks of gestation.

Exclusion criteria

Women who had gestational ages <28weeks at the time of delivery.

The estimated blood loss of 1,000 mL within 24 hours postpartum was the study's principal finding. The blood loss volume was visually estimated using the scaled suction containers that absorbed fluids from the operating table, the amount of blood-soaked medical gauzes, and the area that was blood-stained in the surgical drapes. The surgery and nursing records both included information about the overall amount of blood loss. The demographic factors were maternal age, socio-economic status, parity, and literacy. There are three categories for maternal age: 25 years, 25-35 years, and >35 years. Nullipara (no h/o previous delivery > 28 weeks of gestation) and multipara were the variables used to group parity. Medical and obstetric factors refer to methods of conception, number of fetuses [singleton or twin], hypertensive disorders of pregnancy, placenta previa, placenta accreta, mode of delivery (vaginal delivery or cesarean section), and macrosomia. The term "placenta previa" refers to the placenta being implanted over or close to the internal cervical OS (less than 2.5 cm on ultrasonography). According to medical records or placental pathology, the placenta accreta spectrum, which includes placenta accreta, increta,

and percreta, was characterised as placental infiltration of the uterine wall based on ultrasonography before delivery. A birth weight of more than 4 kg was considered macrosomia.

RESULTS

242 participants (4.23%) in this study had PPH. According to subgroup analysis, the incidence of PPH was, respectively, 4.2, 6.34, 4.03, and 4.31% in patients of singletons, twin pregnancies, caesarean sections, and vaginal deliveries.

Table 1: Prevalence of singleton and twin pregnancy with incidence of PPH

	Delivered	PPH	Percentage
Singleton	5584	234	4.2%
Twins	126	8	6.34%
Total	5710	242	4.23%

Table 2: Mode of delivery with incidence of PPH

Mode of delivery	Delivered	PPH	Percentage
Vaginal	3874	168	4.3%
C-section	1836	74	4.03%
Total	5710	242	4.23%

In this study, the age > 35 years showed the more incidence of PPH (11.0%) than other age groups, it could be because of higher prevalence of placenta previa, previous scar cases, ART, c- section, co-morbidities.

Table 3: Incidence of PPH according to different age groups.

Age (Years)	Delivered	PPH	Percentage
<25	3289	126	3.8%
25-35	2258	98	4.3%
>35	163	18	11.0%
Total	5710	242	4.23%

In this study, there is incidence of PPH in multi gravid is more than primigravida which is 4.35, 4.06 respectively.

Table 4: incidence of PPH according to parity of the patient.

Parity	Delivered	PPH	Percentage
primigravida	2312	94	4.06%
Multigravida	3398	148	4.35%

In this study, the preterm deliveries of gestational age 32 weeks-33weeks+6days have shown the highest incidence of PPH (12.5%).

Table 5: Incidence of PPH at different gestational age

Gestational Age	Delivered	PPH	Percentage
>37	5298	225	4.2%
34-36+6 days	376	13	3.4%
32-33+6 days	24	3	12.5%
<32	12	1	8.3%

In this study, the incidence of the PPH is highest in the lower socioeconomic class which is 5.4%.

Table 6: Socioeconomic class with its incidence of PPH

Socio-economic class (By modified kuppuswamy scale)	Deliveries	Incidence of PPH	Percentage
Upper class	520	12	2.3%
Upper middle	694	19	2.7%
Lower middle	886	26	2.93%
Upper lower	1580	74	4.6%
Lower	2030	111	5.4%

In this study, according to the data collected with incidence of 4.3%, it shows that the rural population is at risk for incidence of PPH.

Table 7: Patient's residence with its incidence of PPH

Patient's residence	Delivered	PPH	Percentage
Rural	4236	186	4.3%
Urban	1474	56	3.7%

In this study, the unbooked cases were at more risk for incidence of PPH with percentage of 4.7

Table 8: Booked or unbooked with incidence of PPH

Booked/unbooked	Deliveries	Incidence	Percentage
Booked	3658	144	3.9%
Unbooked	2052	98	4.7%

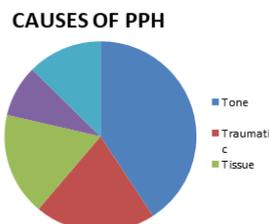
In this study, the anemic patients have shown more incidence (11.9%) of PPH than hypertensive patient (7.96%). Macrosomia is also a high risk factor for PPH.

Table 9: Other significant conditions with their incidence of PPH

Other conditions	Delivered	PPH
Hypertensive disorders of pregnancy	1658	132
Anemia	1984	238
Malpresentation	686	31
Previous Scar	1874	112
Cervical stitch	283	14
Macrosomia	212	22
Placenta previa	26	12
Placenta accreta spectrum	18	08

Causes of PPH among women delivered in this study facility, different causes related to postpartum hemorrhage within two consecutive years were identified. However, the uterus atony, trauma, retained placenta, placental abnormalities, coagulopathy (4T's) were the major causes of PPH. The mothers with coagulopathy disorder were 9%, traumatic PPH 21%, retained placenta 18%, and atone uterus 42%, other causes 13%.

Causes



DISCUSSION

According to the study's findings, 242 (4.23%) of the 5710 pregnant women who participated in it suffered from PPH. The group results suggests that, for singletons, twin pregnancies, caesarean sections, and vaginal deliveries, respectively, the incidence of PPH was 4.2, 6.34, 4.03, and 4.3%. According to a study involving 8.5 million pregnant women in the United States in 2008, the incidence of PPH was 2.8% [16]. Another larger study with more than 30 million patients from 2014 revealed a comparable prevalence of 3.2% [17]. Research from 2009 in Canada revealed a 7.9% incidence of PPH in vaginal births and 2.7% in cases of caesarean section [18]. However the main cause of PPH found in the study was Atonic PPH (42%) and placental abnormalities which seems to be the main causes the same as the result found in different studies in both developing and developed countries [19 – 21]. According to study conducted by Li S, Gao J, Liu J, Hu J et al incidence of PPH in twin gestation is 3.4% and in our study it is 6.34% [22]. And also study conducted by Li S, Gao J, Liu J, Hu J et al incidence of PPH in their study is 1.7 and in our study it is 4.03% [22]. In our study most common age group of patients is < 25 but more incidence of PPH is seen with patient's age > 35 years.

According to study conducted by Mesfin S, Dheresa M, Fage SG et al incidence of PPH in multigravida is 11.2% but in our research study it is only 4.35%. and also by the study of Mesfin S, Dheresa M, Fage SG et al more incidence in gestational age of 37- 41 weeks but in our study it is around 32-34 weeks our findings are nt comparable with them. According to our study, PPH is more commonly seen in lower socio-economic status [23].

According to study conducted by Mvandal S, Kindimba C et al the incidence of PPH in their study in cases of macrosomia and anemia (hb<10) is 8.7%, 33.65 respectively which is in our study is 10.3 and 11.9% respectively. Placenta previa and placenta accreta spectrum have the highest incidence rate of 46.15 and 44.44% respectively [24].

CONCLUSION

The risk variables for PPH were very slightly impacted by the number of fetuses and the delivery mode. Placenta previa and placenta accreta were the two main PPH risk factors. A combination of the identified risk factors produced acceptable predictive results in predicting PPH in the overall cohort, singleton pregnancies, and women who gave birth via caesarean section; however, the effectiveness was only moderate in twin pregnancies and in women who gave birth vaginally.

Early pregnancy concerns such prior PPH, numerous pregnancies, coagulopathy diseases, malpresentation, and others might help doctors identify the pregnant women who are at risk for severe intervention. The practice of home birth should be outlawed, and rural health services should be enhanced.

ACKNOWLEDGMENTS

We would like to thank the following for their support of this study: Dr. Vithhalrao Vikhe Patil Foundation's Dr. Vikhe Patil Memorial Hospital, Vilad Ghat, Ahmednagar

REFERENCES

- [1] Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, Gülmezoglu AM, Temmerman M, Alkema L. The Lancet global health 2014;2(6):e323-33.
- [2] Kassebaum NJ, Barber RM, Bhutta ZA, Dandona L, Gething PW, Hay SI, Kinfu Y, Larson HJ, Liang X, Lim SS, Lopez AD. The Lancet 2016;388(10053):1775-812.
- [3] American College of Obstetricians and Gynecologists. Obstet Gynecol 2006;108(4):1039-47.
- [4] Li XF, Fortney JA, Kotelchuck M, Glover LH. Int J Gynecol Obstetr 1996;54(1):1-0.
- [5] 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.

- [6] Creanga AA, Berg CJ, Ko JY, Farr SL, Tong VT, Bruce FC, Callaghan WM. Maternal mortality and morbidity in the United States: where are we now?. *Journal of women's health*. 2014 Jan 1;23(1):3-9.
- [7] Chandrharan E, Krishna A. *BMJ* 2017;27;358.
- [8] Kramer MS, Berg C, Abenhaim H, Dahhou M, Rouleau J, Mehrabadi A, et al. *Am J Obstet Gynecol* (2013) 209:491–497. doi: 10.1016/j.ajog.2013. 07.007
- [9] Von Schmidt auf Altenstadt JF, Hukkelhoven CW, Van Roosmalen J, Bloemenkamp KW. *PLoS One* 2013;8(12):e81959.
- [10] Sosa CG, Althabe F, Belizán JM, Buekens P. *Obstetr Gynecol* 2009;113(6):1313.
- [11] Ononge S, Mirembe F, Wandabwa J, Campbell OM. *Reproductive Health* 2016;13(1):1-7.
- [12] Al-Zirqi I, Vangen S, Forsen L, Stray-Pedersen B. *Int J Obstetr Gynaecol* 2008;115(10):1265-72.
- [13] Nyfløt LT, Stray-Pedersen B, Forsen L, Vangen S. *PloS One* 2017;12(4):e0175306.
- [14] Fukami T, Koga H, Goto M, Ando M, Matsuoka S, Tohyama A, et al. *PLoS One* 2019:208–16. doi: 10.1371/journal.pone.0208873
- [15] Gyamfi-Bannerman C, Srinivas SK, Wright JD, Goffman D, Siddiq Z, D’Alton ME, Friedman AM. *Am J Obstetr Gynecol* 2018;219(2):185-e1.
- [16] Kramer MS, Berg C, Abenhaim H, Dahhou M, Rouleau J, Mehrabadi A, et al. *Am J Obstet Gynecol* (2013) 209:491–497. doi: 10.1016/j.ajog.2013. 07.007
- [17] Reale SC, Easter SR, Xu X, Bateman BT, Farber MK. *Anesthesia & Analgesia* 2020;130(5):e119-22.
- [18] Mehrabadi A, Hutcheon JA, Lee L, Kramer MS, Liston RM, Joseph KS. *BJOG* 2013;120(7):853-62.
- [19] Nyfløt LT, Sandven I, Stray-Pedersen B, Pettersen S, Al-Zirqi I, Rosenberg M, Jacobsen AF, Vangen S. *BMC Pregnancy And Childbirth* 2017;17(1):1-9.
- [20] Tayade Motilal C. *Pravara Med Rev* 2015;7(3) 4-6
- [21] Ononge S, Mirembe F, Wandabwa J, Campbell OM. *Reproductive Health* 2016;13(1):1-7.
- [22] Li S, Gao J, Liu J, Hu J, Chen X, He J, Tang Y, Liu X, Cao Y, Liu X, Wang X. *Front Med* 2021;8.
- [23] Mesfin S, Dheresa M, Fage SG, Tura AK. *International Journal of Women's Health* 2021;13:663.
- [24] Mvandal S, Kindimba C. Prevalence, Causes and associated factors for Postpartum haemorrhage (PPH) at St. Joseph referral hospital Peramiho-Songea, Tanzania; A hospital-based retrospective cross-sectional study.