Frequency of Post-Partum Hemorrhage and Associated Factors in Primiparous Women

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ABSTRACT

Background: Postpartum hemorrhage refers to excessive blood loss during or after delivery, it defined as blood loss greater than or equal to 1000 ml or blood loss within 24 hours after the birth. The objective of this study is to investigate frequency of post-partum hemorrhage and associated factors in primiparous women.

Materials and Methods: A hospital based cross sectional study was conducted among 104 women aged 18-48 years, during six months (01/Oct/2022 to 30/March/2023). Women diagnosed post-partum hemorrhage and admitted in Nangarhar university teaching hospital (gestational age 36-42 weeks) were included in the study.

Findings: Among 104 women, who were observed, mean age was 25.70 ± 5.24, most affected (71.15%) age group interval was (20 to 29-year age group). About 63(60.60%) were Primiparous and (39. 40%) women were multi parous. About fourth-five (80.80%), two third (67.30%), and one -third (31.70%) of participant were, illiterate and house wives, lived in rural areas and expressed as the economic condition as poor, respectively.

Conclusion: History of pre-delivery anemia, maternal age, prolong labor, type of delivery, oxytocin use, low economic status, low education level and hypertension in pregnancy were associated factors for postpartum hemorrhage. 20-29-year age group, atony of uterus, prolonged labour, use of oxytocin, toxemia of pregnancy, and C/S delivery was statistically significant risk factors between primiparous and multiparous women. Close observation in antenatal, pre partum periods and intrapartum period is needed to identify women who have associated factors and early intervention to prevent post-partum hemorrhage.

Keywords: Associated factors, Atony of uterus, Labor, Post-partum hemorrhage

INTRODUCTION

Excessive bleeding after childbirth, a leading cause of maternal deaths worldwide, has gained international attention among medical and research communities for decades (Al-Zirqi et al., 2008). Obstetrical hemorrhage continues along with hypertension and infections as one of the infamous "triad" of causes of maternal deaths in both developed and underdeveloped countries (Cunningham et al., 1997). According to Dutta (2004), postpartum hemorrhage refers to excessive blood loss during or after delivery, generally defined as blood loss greater than or equal to 1000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process.

Postpartum hemorrhage is the leading cause of maternal death about 19.7% worldwide. The rate of maternal death is highest in low-income and middle-income countries and accounting for 480000 (32%) of death in northern Africa, but 1200 (8%) in developed regions (Lutomski et al., 2012). The cause of postpartum

hemorrhage should be determined. The most common causes are uterine atony with bleeding from the placental implantation site, genital tract trauma, or both (Cunningham et al., 1997). Atonicity of the uterus is the commonest cause of post-partum hemorrhage which accounts for 80% of cases of primary post-partum hemorrhage; with the separation of the placenta, the uterine sinuses, which are torn, cannot be compressed effectively due to imperfect contraction and retraction of the uterine musculature and the bleeding continues. (Gani & Ali, 2013) argue that post-partum hemorrhage has many other causes like, lacerations of genital tract, rupture of the uterus, episiotomy and coagulopathy. However, studies conducted in Nigeria, Denmark, and Ethiopia, revealed the commonest causes of postpartum hemorrhage were genital tract trauma and retained placenta. Hoestermann et al. (1996) states that atony of uterus promotes by many associated factors as prolongation of the stages of the labor, augmentation of the labor by oxytocin, placental abnormality, placental implantation abnormality, placental retention, parity and polyhydramnios's leiomyoma of the uterus.

In Africa, studies have shown that the major causes of maternal death are post-partum (especially primary postpartum) hemorrhage (25.7%), hypertension (14%), Sepsis (11%), abortions (8%), and other indirect causes (28%) (Halle-Ekane et al., 2016). In Africa and Asia, it is responsible for more than 30% of all maternal deaths (Khan et al., 2006). In contrast, in developed countries such as the UK and the USA obstetric hemorrhage causes just 3.4% and 11.4% of maternal deaths, respectively (Shahbazi Sighaldeh et al., 2020). According to (Kebede et al., 2019), Afghanistan is among the countries which have the highest maternal mortality rate in the world. In this war-torn country, the ratio of maternal mortality is 400 per 100,000 live births. Hemorrhage is the leading cause of maternal mortality in Afghanistan that accounts for 38% of all those deaths. To be more specific, 30% of maternal deaths are related to post-partum hemorrhage (Kebede et al., 2019).

Regular checkup during prenatal period, intranasal, post-natal and closed observation at the time of 3rd stage of labor is a dangerous state in mothers' lives. At this time more deaths happen therefore this study aims to determine the associated factors of postpartum hemorrhage and reduce maternal death and morbidity. It provides the opportunity for the health policy makers to expand better policy for maternal health.

MATERIALS AND METHODS

Study Area

It is a hospital based cross-sectional study design, carried out in six-month period in 104 women to estimate the frequency of associated factors for post-partum hemorrhage in primiparous women. Collection of the data was done in Nangarhar University Teaching Hospital, Jalalabad city, Nangarhar, Afghanistan. For the purpose of interview, a questionnaire was made. The participants of the study include the mothers who came for childbirth and suffered from post-partum hemorrhage at the time of the study, and admitted in Nangarhar University Teaching Hospital. The inclusion criteria were all the mothers whom came for delivery at age 18-48, and suffered from primary post-partum hemorrhage after spontaneous vaginal delivery or delivered by cesarean section. Massive bleeding in abortions and PPH in women whom suffered from other chronic disease as chronic heart disease and chronic pulmonary disease were excluded.

The postpartum hemorrhage diagnosed by the blood loss measured by visual estimation (mainly relies on number of blood soaked materials, drapes and in c/s suction canisters), the estimated blood loss volume, shock index and hemoglobin level and the number of pads sodden with blood.

Samples Collection

The data were collected from 01/Oct/2022 till 30/March/2023. The objectives of the study were told to the participants and a verbal consent were taken. In a calm place and a private room the interview were conducted. The trainees of specialization program and senior doctor staff were hired for gathering the data. For a reliable collection of the data the training of the staff and editing the questionnaire were done.

Statistical Analysis

The data was inserted to the IBM SPSS version 26 for analysis. For all continues variables we used the univariate analysis and descriptive statistics including mean ± standard deviation frequency, and percentage. Comparison between primiparous and multiparous was made by using ANOVA test. Instead of names of participants by using codes and numbers the confidentiality of the study was ensured.

RESULTS

This study involved 104 Post-partum Hemorrhage cases delivered (from 01/Oct/2022 to 30/March/2023) at Nangarhar University Teaching hospital in Jalalabad, Nangarhar Afghanistan. The mean age of mothers was 25.70 ± 5.24 with a range 18–48 years. About 8 (7.70%) women were under 20 years, 74 (71.15%) were 20 to 29 year and 22 (21.15%) were 30 and more than 30 years. Mean BMI 24.58 ± 2.66, about 10% of them were obese (Table 1).

Among fourth-five (80.80%) of the participant were illiterate (not educated) and house wives, while 20 (19.20%) were literate. Two third (67.30%) lived in rural areas and one-third (32.70%) of them lived in urban areas. Only 12.5% the participant expressed their economic status as good, however one –third expressed as poor. Majority of the study participant didn't have job, only 20% had skilled and unskilled occupations. About two-thirds of the study participants consisted of primiparous mothers 63 (60.60%) and one third (39. 40%) were multi parous.

Table 1: Socio-Demographic characteristics

Demographic variables		Number N =104	Percentage 100%
Age	Less than 20 year	8	7.70
	20 to 29 year	74	71.15
	30 and more than 30 years	22	21.15
Body weight	BMI normal (18.5-24.9)	94	90.40
	Over weight and obese	10	9.60
Educational status	Illiterate	84	80.80
	Literate	20	19.20
Residence	Rural	70	67.30
	Urban	34	32.70
Economic status	Poor	33	31.70
	Average	58	55.80
	Good	13	12.50
Occupation	No (house wife)	84	80.80
	Yes	20	19.20
Parity	Primi parous	63	60.60
	Multi parous	41	39.40

Table 2 shows that about 32 (50.20%) primiparous participants had normal vaginal delivery, 31 (49.20%) had cesarean section and instrumental/assisted deliveries. 31(75.60%) multiparous women had normal vaginal delivery, 10 (24.40%) had cesarean section and instrumental/assisted deliveries. Of the respondent about one-third 47.60% primiparous and 19.50% multiparous were used oxytocin during delivery and (52.40%) primiparous and 80.50% multipara were not used oxytocin during the birth of their babies.

Atony of the uterus occurred in 46 (73%) primiparous and in 19 (46%) multiparous women. About 30 (47.60%) primiparous and 36(87.80%) multiparous had history of prolong labor. 10 (15.90%) primiparous and 30 (73.20%) multiparous women had history of toxemia of pregnancy.

Table 2: distribution of various obstetric associated factors

Associated factors		Primiparous n=63		Multiparous n=41	
		n	%	N	%
Type of delivery	Normal vaginal	32	50.80	31	75.60
	C/S & Instrumental / Assisted delivery	31	49.20	10	24.40
Use of Oxytocin	Not used	33	52.40	33	80.50
	used	30	47.60	8	19.50
Prolong labor	Yes	33	52.40	5	12.20
	No	30	47.60	36	87.80
Hypertension (toxemia of pregnancy)	Yes	10	15.90	30	73.20
	No	53	84.10	11	26.80
Atony of uterus	Yes	46	73.00	19	46.30
	No	17	27.00	22	53.70

The mean period of gestation in primiparous was 38.09 weeks and in multiparous was 38.40; it shows that most women had full term pregnancy period (Table 3).

Table 3: mean period of gestation

Mean period of gestation	Mean ± 2SD weeks
Primiparous	38.09± 1.21
Multiparous	38.40±1.18

The total prevalence of mild anemia in primiparous women was (22.20%) and in multiparous it was (24.40%). Moreover 11 (17.50%) primiparous women had moderate to severe anemia and in multiparous women the prevalence was (26.80%) as summarized in Table 4.

Table 4: level of Anemia in PPH patients

level of anemia	Hb level	Primi parous		Multiparous	
		n	%	N	%
No anemia	Hb > 12 grm	38	60.30	20	48.80
Mild anemia	Hb 10-11.9 gram	14	22.20	10	24.40
Moderate to severe anemia	Hb < 10 gram	11	17.50	11	26.80

Table 5 shows that placental retention was 14 (13.46%) and the rupture of uterus was occurred in 1.92%. 12.5% of participating women had genital tract lacerations, 0.96% women had an episiotomy and 2.88% had coagulopathy.

Table 5: distribution of Miscellanies Causes of Post-Partum Hemorrhage.

Causes	Frequency	Percentage
Retained placenta	14	13.46
Uterus rupture	2	1.92
Lacerations of genital tract	13	12.5
Episiotomy	1	0.96
coagulopathy	3	2.88

Table 6 show that (20-29 year) age group, atony of uterus, prolonged labour, use of oxytocin, toxemia of pregnancy, and C/S delivery was statistically significant ($p < 0.05$) risk factors between primiparous and multiparous women.

Table 6: Distribution of PPH Risk Factor among primi and multi-parous Mothers

Risk factor of PPH	Primiparous n=63		Multiparous n=41		p.value
	number	percent	number	Percent	
Atony of uterus	46	73%	19	46%	0.02
Prolonged labour	33	52%	5	12.2%	< 0.001
Use of oxytocin	30	47.6%	8	19.5%	0.03
Toxemia of pregnancy	10	15.9%	30	73.20%	< 0.001
Age (20-29 year)	54	85.7%	21	51.2%	< 0.001
C/S and Instrumental/ assisted delivery	31	49.2%	10	24.4%	0.01

DISCUSSION

Complications related to pregnancy are the main causes of the mothers' death and morbidities in developing countries. In Socio demographic factors in our study education level found to be an important factor that there were (80%) illiterate women in compare to Khyber, Pakistan (66%) and it shows that in Afghanistan the education level is lower than other countries (Gani & Ali, 2013). The other reason may be people lack the education of self-care and the role of delivering at hospitals and maternity centers and not attending prenatal

clinics for checkups. If we compare the age, in our study most frequent age group was between 20-29 years in compare to Ethiopia the maternal age was 35 or above, in our country based cultural and religious beliefs many girls get married at a young age. Low literacy rate is also encouraging family to marry an early age, lower age however some researches indicates there is not any significant relationship between women age and PPH (Fukami et al., 2019). In our study about two-third (67.30%), participant was lived in rural areas compare to Tanzania the rural percentage was (73.3%) which shows that the health facilities in under developed countries (Afghanistan) are not accessible and available in rural areas in Tanzania (Mvandal & Kindimba, 2021).

The study result shows that the most common cause of the PPH in primiparous women was uterine atony 46 (73%), these finding is a bit higher than Kabul (65.6%) (Kebede et al., 2019) and compared to Bonassama district hospital Cameroon (Mvandal & Kindimba, 2021). The uterine atony percentage were 68.26% nearly the same as our study finding.

The second common cause is the placental retention, in our study also the placental retention were the second cause of PPH about (13.46%) and in compare to China it is lower (53.83%) (Fukami et al., 2019). The cause could be that in our study the participants delivered in hospital and the placenta were removed by the trained midwives or doctors, so the bleeding is well controlled.

In the study, the main associated factors were pre-delivery anemia, toxemia of pregnancy, parity, prolong labor, socio-demographic factors and type of delivery. Our study showed that prolong labour was associated with postpartum hemorrhage and this was reported by other studies as well. Atonia of the uterus initiates by prolonged and obstructed labor and it ends with post-partum hemorrhage. Prolong labor in compare to Kabul (26.5%) it was higher in Nangarhar, maybe in Nangarhar health facilities are not accessible to all pregnant women and also the education level is lower than Kabul (Kebede et al., 2019). Our study showed (17.50%) had history of anemia in compare to Ethiopia (13.5%) is higher (DeCherney et al., 2019), The reasons are financial problems, low education, not attending in antenatal care centers for checking Hb level and lack of obstetric care.

In addition, our study showed that toxemia of pregnancy were found to be an associated factor for PPH, in compare to a study in Israel it is the same. The mechanism for the association between the hypertensive disorder and PPH can be pathologic placentation (Baskett, 2014). According to our finding, half our participants had spontaneous vaginal delivery. Similar finding were also reported from the studies done in Ethiopia (81.8%) (DeCherney et al., 2019; Kebede et al., 2019).

As the study indicates that primiparity (60.60%) was found to have significant association with post-partum hemorrhage. The opposite studies were found in Ethiopia, Cameroon, Tanzania (DeCherney et al., 2019; Mvandal & Kindimba, 2021) that in their studies multiparty were high risk for PPH. Their reasons could be uterine muscles stretching which in turn decrease the tone of the muscles and causes the atony of the uterus. Our study shows that in primiparous an important associated factor was prolong labor maybe the cause is that frequent and prolonged contraction increases the need of instrumental delivery and in turn increases the chance of grade 2, 3 lacerations and atony of uterus as well. In compare to a study in Israel it showed the same result (Baskett, 2014). Instrumental delivery and assisted delivery also increases the incidence of PPH. It is due to that instrumental delivery raises the risk of vaginal, uterine, cervix and perineum tears.

Beneficiaries of our study are the health providers and the mothers. It provides the opportunity for the health policy makers to expand better policy for maternal health. The limitations are as follows. It is an institutional (hospital based) cross-sectional study, in this study, only critical patients who visited/referred to the

tertiary level hospital are included, therefore we couldn't generalize it is result on community. The overall prevalence of postpartum hemorrhages is also not determined. Due to inaccuracy or inappropriate recording in delivery register book it is impossible to estimate accurate associated factors from secondary data.

CONCLUSION

Close observation in antenatal, intranatal and post-natal periods is needed to recognize women and find the ways for intervention and prevention of PPH. The main cause of PPH is uterine atony and it is common in women who undergone vaginal delivery without use of any instrument. The instrumental delivery increases the chance of genital tract lacerations which in turn after retention of placental parts is the other most common cause of post-partum hemorrhage. The main associated factor of post-partum hemorrhage can be prevent like anemia can be identify and diagnose during pregnancy and intervention in early before delivery. The history of prolong labor, toxemia of pregnancy, use of oxytocin, can be picked up at initial stage and recognize at risk mothers and can be prevented. In antenatal visits should be increased and the health facilitator advise them to deliver under the supervision of trained health workers.

REFERENCES

Al-Zirqi, I., Vangen, S., Forsen, L., & Stray-Pedersen, B. (2008). Prevalence and risk factors of severe obstetric haemorrhage. *BJOG: An International Journal of Obstetrics & Gynaecology*, *115*(10), 1265-1272.

Baskett, T. (2014). Assisted vaginal delivery. *Munro Kerr's Operative Obstetrics E-Book*, 88.

Cunningham, F., MacDonald, C., Gant, F., Leveno, J., Gilstrap, C., Hankins, V., & Clark, L. (1997). Williams Obstetrics, 20th edit. In: Stanford: Appleton & Lange.

DeCherney, A. H., Nathan, L., Laufer, N., Roman, A. S., & Education, M.-H. (2019). *Current diagnosis & treatment: obstetrics & gynecology*. McGraw-Hill Education.

Dutta, D. (2004). *Text book of obstetrics: including perinatology and contraception*. New central book agency.

Fukami, T., Koga, H., Goto, M., Ando, M., Matsuoka, S., Tohyama, A., Yamamoto, H., Nakamura, S., Koyanagi, T., & To, Y. (2019). Incidence and risk factors for postpartum hemorrhage among transvaginal deliveries at a tertiary perinatal medical facility in Japan. *PloS one*, *14*(1), e0208873.

Gani, G. N., & Ali, A. T. (2013). Prevalence and factors associated with maternal postpartum haemorrhage in Khyber Agency, Pakistan. *Journal of Ayub Medical College Abbottabad*, *25*(1-2), 81-85.

Halle-Ekane, G., Emade, F., Bechem, N., Palle, J., Fongaing, D., Essome, H., & Fomulu, N. (2016). Prevalence and risk factors of primary postpartum hemorrhage after vaginal deliveries in the Bonassama District Hospital, Cameroon. *International Journal of Tropical Disease & Health*, *13*(2), 1-12.

Hoestermann, C., Ogbaselassie, G., Wacker, J., & Bastert, G. (1996). Maternal mortality in the main referral hospital in The Gambia, West Africa. *Tropical Medicine & International Health*, *1*(5), 710-717.

Kebede, B. A., Abdo, R. A., Anshebo, A. A., & Gebremariam, B. M. (2019). Prevalence and predictors of primary postpartum hemorrhage: An implication for designing effective intervention at selected hospitals, Southern Ethiopia. *PloS one*, *14*(10), e0224579.

Lutomski, J. E., Byrne, B. M., Devane, D., & Greene, R. A. (2012). Increasing trends in atonic postpartum haemorrhage in Ireland: an 11-year population-based cohort study. BJOG: An International Journal of Obstetrics & Gynaecology, 119(3), 306-314

Mvandal, S., & Kindimba, C. (2021). Prevalence, Causes and associated factors for Postpartum haemorrhage (PPH) at St. Joseph referral hospital Peramiho-Songea, Tanzania; A hospital-based retrospective cross-sectional study.

Shahbazi Sighaldeh, S., Nazari, A., Maasoumi, R., Kazemnejad, A., & Mazari, Z. (2020). Prevalence, related factors and maternal outcomes of primary postpartum haemorrhage in governmental hospitals in Kabul-Afghanistan. *BMC pregnancy and childbirth*, *20*, 1-9.