

Occurrence of post-partum hemorrhage in spontaneous versus induced labor in primigravida at term in a tertiary care hospital of Peshawar

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ABSTRACT

Introduction: Occurrence of post-partum hemorrhage (PPH) is a serious life-threatening complication of delivery and can occur with both normal vaginal delivery as well as induced labor. It is important to define the extent of blood loss after either procedure to adopt the safer method, particularly in complicated deliveries.

Objective: To compare the occurrence of post-partum hemorrhage in spontaneous and induced labor in primigravida at term at a tertiary care hospital of Peshawar.

Materials & Methods: This descriptive cross-sectional study was performed in Obstetrics and Gynecology Department (Gynae B unit), Lady Reading Hospital, Peshawar from 31/5/2019 to 31/11/2019. Total patients observed were 134. All women were subjected to complete history taking and detailed examination. Brief obstetrical history, period of gestation, mode of onset of labor and frequency of post-partum hemorrhage (more than 500 ml after vaginal delivery) were noted. Women were induced with prostaglandin E₂ gel only. The second gel was repeated after 6 hours if first attempt was failed. No more than three gels were used. Women were excluded from the study if they failed to go into labor even after the third gel. After vaginal delivery sanitary pads were used for blood loss estimation. They were weighed beforehand and after being soaked with blood, they were again weighed and the difference was noted as 1 gm = 1 ml. Descriptive statistics were done by SPSS 21.

Results: The mean age of subjects was 32 ± 3.90 years. Forty two percent patients had BMI ≤25 and 58% patients had BMI >25. Seventy two percent of patients were having spontaneous labor and 28% were having induced labor. Twenty percent of patients had post-partum hemorrhage, 7% in spontaneous labor while 44% in induced labor, showing significant difference (p=0.03).

Conclusion: Post-partum hemorrhage occurred significantly more frequently in primigravid women at term undergoing induction of labor as compared to spontaneous labor.

Keywords: Postpartum hemorrhage; Labor; Pregnancy; Prostaglandin E₂.

The authors declared no conflict of interest. All authors contributed substantially to the planning of research, data collection, data analysis, and write-up of the article, and agreed to be accountable for all aspects of the work.

INTRODUCTION

Post-Partum hemorrhage (PPH) is among the foremost causes of global maternal mortality.¹ It is defined as blood loss of >500 ml after vaginal delivery or >1000 ml after caesarean delivery.² If the blood loss occurs within 24 hours of delivery, it is termed as primary or early PPH, whereas blood loss 24 hours post-delivery is termed secondary or late PPH.³

World Health Organization data show that 25% of the maternal deaths are due to PPH, accounting for >100,000 deaths annually.⁴ American College Of Obstetricians & Gynecologists suggests that almost 140,000 maternal deaths per year (or one woman every four minutes) are due to PPH.⁵ The prevalence is 34% in Pakistan.⁶ The exact frequency of PPH is hard to determine; however, estimates suggest that 4-6% of all deliveries are obscured by PPH.⁷

Induction of labor is initiated by stimulating the regular uterine contractions before the onset of spontaneous labor through pharmacological and mechanical techniques in order to produce progressive dilatation of cervix followed by delivery.⁸ A pregnant woman is said to be "at term" when the duration of pregnancy reaches 37 weeks, taking a normal pregnancy duration of about 40 weeks starting from the last menstrual period (LMP) of a woman (normal range of 37-42 weeks). When pregnancy lasts for more than 42 weeks, it is termed as "post-dates". It usually occurs in 5-10% of pregnant women and the risk of adverse events increases for both mother and fetus.⁹

Labor induction is one of the most commonly performed obstetric procedures worldwide. Data show the percentage of labor induction up to 42% in Pakistan, 24.5% in the United States, 35.5% in Sri Lanka, and 6.8% to 33% in Europe.¹⁰ Frequency of labor induction is increased nationally and internationally over the last decade.¹¹ It is mostly done in preterm rupture of membrane (PROM), post-date pregnancy, and gestational diabetes; there has been an increased trend towards elective induction on maternal request for personal or social reasons.¹² Common ways of labor induction are artificial rupture of membrane (ARM), prostaglandins tablets, pessary or gel and oxytocin infusion.^{13,14}

Some studies reported that induced labor was associated with increased risk of PPH while others reported no significant difference between the frequencies of PPH in spontaneous and induced labor.^{15,12} As there is controversy between the risk of PPH and labor induction, therefore the current study will provide a good understanding of the association between PPH and induction of labor. Moreover, if our results were suggestive of association between PPH and induction of labor, it will keep the doctor watchful to take pre-emptive measures for the active management of third stage of labor.

MATERIALS & METHODS

This descriptive cross-sectional study was conducted in Obstetrics and Gynecology unit 'B' of Lady Reading Hospital (LRH), Peshawar, from 31/5/2019 to 31/11/2019, after approval from the institutional ethical committee on a calculated sample size of 134, keeping 7.6% prevalence of post-partum hemorrhage in spontaneous labor with confidence interval of 95% and 5% margin of error using the WHO sample size calculation.¹³ The study included all the primigravida patients at term who delivered vaginally either by induction (Prostaglandin E₂ gel only) or spontaneous labor, of ages 18-40 years and with normal BMI. Those patients who were already referred from other hospitals after handling, patients with bleeding disorders, multiple pregnancy, polyhydramnios, previous uterine scar (e.g., myomectomy, previous cesarean section), instrumental delivery, fetal death and drug history (antiplatelet, anticoagulant drugs during pregnancy) were excluded from the study. The objectives and benefits of the study were clarified to the participants and their privacy was maintained. All participants were subjected to comprehensive history taking and thorough examination. Brief obstetrical history, period of gestation, mode of onset of labor and frequency of post-partum hemorrhage (more than 500ml after vaginal delivery) were noted. Women were induced with prostaglandin E₂ gel only. The second gel was repeated after 6 hours if the first attempt failed. No more than three gels were used. Women who failed to have onset of labor even after third gel were excluded from the study. After vaginal delivery sanitary pads were used for blood loss estimation. They were weighed before (without blood) and after being soaked with blood and the difference was noted, 1gm = 1ml.

STATISTICAL ANALYSIS

Data were entered and analyzed with the help of SPSS 21. Numerical variables like BMI, age, etc., were described by mean and standard deviation. Frequencies and percentages were calculated for qualitative variables like mode of onset of labor and Post-partum hemorrhage. Post-partum hemorrhage was stratified by age, BMI, and mode of onset of labor (spontaneous or induced). Chi-square test was used for analysis of significance related to stratification. A $p \leq 0.05$ was considered statistically significant. Results are presented in the form of tables and graphs.

RESULTS

In this study of 134 primigravida subjects, the mean age was 32 ± 3.90 years, and the mean BMI was $25 \pm 7.341 \text{ kg/m}^2$. Demographic and Obstetric data are shown in Table 1.

Table 1: Demographic & Obstetric data of primigravida subjects (n=134).

#	Demographic variables	Frequency	Percentage
1.	Ages (Years)		
	20-30	100	75
	31-40	34	25
2.	BMI (kg/m²)		
	≤ 25	56	42
	> 25	78	58
3.	Onset of Labor		
	Spontaneous	96	72
	Induced	38	28
4.	PPH		
	Yes	27	20
	No	107	80

Stratification of post-partum hemorrhage with respect to mode of onset of labor (Table 2) showed significant difference ($p=0.03$).

Table 2: Stratification of post-partum hemorrhage with respect to mode of onset of labor (n=134).

PPH	Labor		Total	p-value
	Spontaneous	Induced		
Yes	6 (7%)	21(44%)	27(20%)	0.03
No	80 (93%)	27(56%)	107(80%)	
Total	86 (64%)	48 (36%)	134	

Stratification of post-partum hemorrhage with respect to age and BMI showed insignificant differences (Tables 3 & 4).

Table 3: Stratification of post-partum hemorrhage with respect to age (n=134).

PPH	20-30 years	31-40 years	Total	p-value
Yes	20 (15%)	7 (5%)	27(20%)	0.91
No	80 (60%)	27 (20%)	107(80%)	
Total	100 (75%)	34 (25%)	134	

Table 4: Stratification of post-partum hemorrhage with respect to BMI (n=134).

PPH	≤25 kg/m ²	>25 kg/m ²	Total	p-value
Yes	11 (8%)	16 (12%)	27 (20%)	0.73
No	45 (34%)	62 (46%)	107 (80%)	
Total	56 (42%)	78 (58%)	134 (100%)	

DISCUSSION

PPH remains one of the leading causes of an unacceptably large proportion of maternal mortality in Pakistan. Its incidence can be reduced by routine use of active management of the third stage of labor. Approximately 3% to 5% of obstetric patients will have postpartum hemorrhage. Every year PPH is responsible for one-fourth of maternal deaths worldwide.¹⁶

In our study, the mean age was 32 ± 3.90 years and mean BMI was $25 \pm 7.341 \text{ kg/m}^2$; 72% patients had spontaneous labor and 28% patients had induced labor. Patients with spontaneous labor leading to PPH were 6(22%) while 21(78%) patients with induced labor developed PPH; thus, a significant difference ($p=0.03$) was found between the PPH associated with spontaneous compared to induced labor.

A study was performed by Brinsden et al¹³ to compare the rate of PPH in spontaneous and induced labor in primiparous women. Patients were observed during the study period and when results were compiled it was evident that PPH was associated with 7.6% primiparous women undergoing spontaneous labor and 12.4% with induced labor.¹³ Another study was conducted to compare the association of PPH with spontaneous and induced labor. Among 88 patients, PPH was observed in 8.33% of patients with spontaneous onset of labor, compared to 15.38% patients with induced labor. Frequency of PPH was less in patients with spontaneous labor as compared to induced labor.¹⁵

Another study was performed by Khireddine et al,¹² from December 2004 to November 2006 in France on a wide scale. Data were collected from 106 French maternity facilities of three different French regions, covering almost 20% of deliveries nationwide. The main objective of the study was to evaluate the rate of PPH following labor induction and how to reduce the risk of PPH. Total 6660 cases of PPH occurred during the study period among total deliveries of 146,781 with a rate of 4.6%. A significant difference was found between the association of PPH and induction of labor.¹²

As opposed to our results, another study was performed at University Hospital Zurich, a tertiary care perinatal center to compare association of PPH with spontaneous and induced labor. A total of 965 patients were enrolled in the study. No significant difference was found between the frequencies of PPH in spontaneous or induced labor.¹⁷

CONCLUSION

The frequency of post-partum hemorrhage was significantly more in primigravid women at term undergoing induction of labor compared to those delivering via spontaneous labor.

RECOMMENDATION

Postpartum hemorrhage is a very common and grave complication of induced labor which needs serious attention after the delivery has been performed. Increased frequency of PPH has been directly associated with abundant use of labor induction. Consequently, labor induction shall only be considered in cases where the benefits outweigh the risks involved.

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