Research Article

# Frequency of Postpartum Haemorrhage after Administration of Per-Rectal Misoprostol in Females Undergoing Vaginal Delivery

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**Abstract** | This study was designed to determine the frequency of postpartum hemorrhage after administration of per rectal misoprostol in females undergoing normal vaginal delivery. The study was conducted at the Department of Obstetrics and Gynaecology, Teaching Hospital, Lahore from 02-09-2014 to 03-03-2015. Non-probability and purposive sampling techniques were used. A total of 220patients undergoing normal vaginal delivery at term after administration of per rectal misoprostol were enrolled with 95% confidence interval (C.I). The error margin was 5% and the prevalence of postpartum haemorrhage was 16.5%. Data was entered and analyzed through SPSS 17. In this study, the mean age of study participants was found to be 29.89±5.89 years while the mean gestational age was 38.86±1.38 weeks. Postpartum haemorrhage was observed in 35.45% cases. Blood loss was recorded in patients with a mean of 374±134.91 mL. Statistically, a highly significant difference was observed between the blood loss and postpartum haemorrhageamong the patients (i.e. p-value=0.000). A low frequency of postpartum hemorrh agein women experiencing normal vaginal delivery after misoprostol was administered. The blood loss was recorded to be very low among females.

**Received** | August 30, 2017; **Accepted** | June 06,2018; **Published** | March 20, 2018
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**Citation** | Akhtar, M., I. Naheed, K. Waheed and A.Khanum. 2018. Frequency of Postpartum Haemorrhage After Administration of Per-Rectal Misoprostol in Females Undergoing Vaginal Delivery. *Annals of King Edward Medical University*, 24(1): 148-153.
**DOI** | https://doi.org/10.21649/akemu.v24i1.2367
**Keywords** | Normal vaginal delivery, Misoprostol, Postpartum hemorrhage

## Introduction

Postpartum haemorrhage(PPH) is a leading cause of maternal death in developing countries. Any type of bleeding from female genital tract that leads to hemo-dynamic variability (decrease in blood pressure and/orraised pulse rate) or up to 10% declined hematocrit is called postpartum haemorrhage[1].

Haemorrhage that occurs within first 24 hours after the delivery is normally called primary bleeding. The blood loss may recur after 1st week to up to 6 weeks of the delivery of baby i.e. referred as secondary postpartum haemorrhage [2]. Prevalence of PPH in Pakistan is 34% and a major health related Millennium Development Goal 5 was to reduce 75% maternal mortality rate between 1990-2015. [3]

The insufficient availability of the medications used for active management of third stage of labor is a key factor for the higher rate of postpartum haemorrhage in developing countries [4]. There are few other reasons which lead to much less than desired outcomes of postpartum haemorrhage in developing countries. The inexperienced caregivers are at top being unable to manage the postpartum haemorrhage. The drugs those are primarily meant for treatment of postpartum haemorrhage are used as prophylactic drugs for the prevention against postpartum haemorrhage in third stage active management. The insufficient blood

transfusion and anesthesiafacilities and operating capabilities are among the factors. A number of comorbidities are prevalent in the developing countries those tend to increased blood loss in such patients. [4]

Misoprostol is a manmade prostaglandin E1 (PGE1) analogue that is used in the treatment of missed miscarriage, prevention of gastric ulcers. It is also a major drug to induce the labor and the abortion [5]. Misoprostol is cost effective and is readily available. Paramedical staff and mid wives have legislative privilege to use it. It has advantageous of long shelf life and no specific storage requirements. Per rectal use of misoprostol in unconscious patient is permissible. There are very few side effects of this drug i.e. pyrexia and shivering. [6]

Misoprostol is also useful for the prevention and treatment of PPH. In contrast to other administration routes, the rectal administration of misoprostol has shown to have ideal results with minimal and low rate of side effects when indicated for haemorrhage. A number of studies including case reports and randomized controlled trials have reported rectal administration of misoprostol.[7], [8] Misoprostol is not an expensive medicine. It is stable at room temperature i.e. refrigeration is not required like that of oxytocin. These factors make it a valued drug to be used in developing countries such as Pakistan.[9] A study based on randomized control trials reported a reduction of 38%maternal mortality after use of misoprostol, those occur due to PPH in under resource-limited populations.[10] So, misoprostol is endorsed on the basis of its low cost, thermo stability, high effectiveness and low rate of side effects. Misoprostol is usually given through rectal or oral route while Oxytocin is administered by injection only. This feature makes it advantageous particularly in areas where physicians and trained nurses are not available. [11]

A study published a very low incidence of postpartum haemorrhage i.e. 1.6% among the women those were administered misoprostol. [12]

Two of the studies carried out in Pakistan and Iran, reported 16.5% to 19% of the cases with misoprostol induced postpartum haemorrhage [1],[13] while 45% women developed PPH due to misoprostol in Africa. [14]

The key objective of current study was to measure the frequency of postpartum haemorrhage in women experiencing normal vaginal delivery. The cited literature has provided a vast range of postpartum haemorrhage in the patients those were given misoprostol, contradicting with each other. Usually, no drug is administered to prevent postpartum haemorrhage but the rate of haemorrhage is significantly increasing because of this fatal outcome in for delivering women. The available data is not sufficient to decide about the use of misoprostol in our settings to prevent the life threatening PPH, due to its larger range i.e. 1.6% to 45% or more. It is desirable to carry out the efficacy of misoprostol to use it for the sake of preventing postpartum haemorrhage in limited resourceful and developing country.

## Materials and Methods

A total of 220 high-risk women were recruited in the study from labor ward of Department of Obstetrics and Gynaecology, Teaching Hospital, Lahore after approval of the study from ethical committee of the institution. Females with age ranging from 20-40 years those were undergoing delivery at term i.e. gestational age of more than 36 weeks on ultrasound examination and on basis of antenatal record were included in the study.

Those women having allergy to prostaglandins, presenting with severe toxemia and multiple pregnancies on ultrasound examination were not included in the study. Participants with non-cephalic or mal-presentation on ultrasound examination, pregnancy induced hypertension i.e. BP≥140/90mmHg, diabetes mellitus i.e. glucose tolerance test 40mg/dl, pre-eclampsia (pregnancy induced hypertension and a proteinuria) and/ or eclampsia (seizures) were also excluded.

After the informed consent from participants the demographic information was recorded. Active monitoring and management of 3rd stage of the labor was done. Administration of prophylactic uterotonic agent i.e. 5 units of oxytocin at time of delivery at anterior shoulder that was followed by controlled cord traction (CCT) to deliver the placenta and uterine massage. Then 600µg of misoprostol was placed per rectal and women were observed after each ½ hour for hemorrhage for up to 24 hours. As per definition postpartum haemorrhage was considered as blood loss from genital tract ≥ 500ml after normal vaginal delivery. Blood loss was calculated by number of pads

soaked during first 24 hours. Patients those developed postpartum haemorrhage, were managed according to institutional guidelines.

All the information was recorded and analyzed using SPSS 17. Quantitative variable like age, gestational age, were calculated by mean standard deviation. Parity and postpartum haemorrhage were characterized as qualitative variables.

## Results and Discussion

The mean age of a total of 220 study participants was calculated as 29.89±5.89 years with a minimum of 20 years to a maximum 40 years old as shown in Table 1.

**Table 1:** *Descriptive statistics of age.*

| Age (years) | Number of Participants | 220 |
|---|---|---|
| | Mean | 29.89 |
| | Std. Deviation | 5.89 |
| | Minimum | 20.00 |
| | Maximum | 40.00 |

**Table2:** *Descriptive statistics of gestational age.*

| Gestational age (weeks) | Number of Participants | 220 |
|---|---|---|
| | Mean | 38.86 |
| | Std. Deviation | 1.38 |
| | Minimum | 37.00 |
| | Maximum | 42.00 |

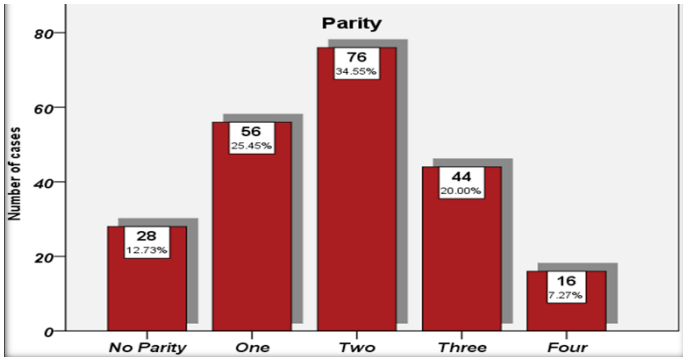


**Figure 1:** *Distribution of Parity.*

In current study a mean gestational age of study participants was found to be 38.86±1.38 weeks. The minimum gestational age was 37 weeks and maximum was found to be 42 weeks as shown in Table 2.

The study results showed that 12.73% (28) women had no parity, 25.45% (56) women had parity one, 34.55% (76) had parity two, 20% (44) had parity three and rest of 7.27% (16) participants were reported to have parity four as shown in Figure 1.

A mean blood loss was recorded as 374±134.91 mL. Minimum value was found as 150.0 ml while maximum value was 690 ml as shown in Table 3.

**Table 3:** *Descriptive statistics of Blood loss.*

| Blood Loss | Number of Participants | 220 |
|---|---|---|
| | Mean | 374.93 |
| | Std. Deviation | 134.91 |
| | Minimum | 150.00 |
| | Maximum | 690.00 |

The results showed that blood loss in women reported to have postpartum hemorrhage had a mean volume of 453.26±159.32 ml. On the other hand, the women having no postpartum hemorrhage had a mean volume of 331±95.67 ml as shown in Table 4.

Significant findings were observed between blood loss and PPH, upon statistical analysis using t-test (value= 6.14) and level of significance (p-value= 0.000).

**Table 4:** *Comparison of blood loss in patients with or without PPH.*

| | | PPH | |
|---|---|---|---|
| | | Yes | No |
| Blood Loss | Number of Participants | 78 | 142 |
| | Mean | 453.26 | 331.90 |
| | Std. Deviation | 159.32 | 95.67 |

There was a total of 117 participants with age of < 30 years while 103 were ≥ 30years old. Out of total of 220 cases 78 had PPH while 142 were not reported to have PPH as shown in Table 5.

Insignificant findings were observed between age sub-groups and PPH, upon statistical analysis using chi-square test (value= 0.18) and level of significance (p-value= 0.67).

**Table 5:** *Descriptive statistics of PPH in age groups.*

| | PPH | | | Total |
|---|---|---|---|---|
| | Yes | | No | |
| Age (Years) | <30 | 43 | 74 | 117 |
| | ≥30 | 35 | 68 | 103 |
| Total | 78 | | 142 | 220 |

Out of a total of 220 study participants, postpartum hemorrhage was recorded in35.5% (78) patients while the condition was not developed in remainder 64.5% (142) cases.

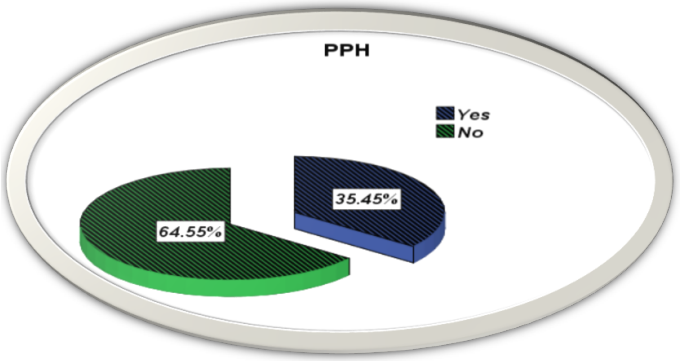


**Figure 2:** *Distribution of PPH among all females.*

The present descriptive cases series study was conducted at Department of Obstetrics and Gynaecology, of a Teaching Hospital, Lahore to find out the frequency of postpartum hemorrhage when misoprostol was administered in the women undergoing normal vaginal delivery.

Postpartum hemorrhage still remains a leading cause of maternal deaths. Nevertheless, the burden of postpartum hemorrhage is highest in developing countries. The rate of incidence of postpartum hemorrhage is increasing by time in the developed world. Prostaglandins have shown to have protective effect in minimizing the blood loss. Misoprostol may be effective to reduce the frequency of PPH and has no adverse effects those are concomitant with other uterotonic drugs. Misoprostol is the one notable exemption, which has a uterotonic property to be used in the active management of third stage of labor. [15]

In current study occurrence of postpartum hemorrhage was recorded to be 35.45% in local females where misoprostol was administered. We found the mean blood loss as 374 ± 134.91 ml. A number of studies have been carried out on the use of misoprostol across the world. In accordance with our study, a few of the relevant studies are discussed here.

Sanghvi et al have reported 92%uterotonic coverage where misoprostol was introduced, in contrast to 25% in the regions where misoprostol was not used. 92% of the participant females showed willingness for its use in future pregnancies while 88% were ready to bear its expense in subsequent deliveries. [16]

Misoprostol reduced the rate of occurrence of postpartum hemorrhage by 53%, decreasing it 12 to 6% as described by Derman *et al*. A further 20% decline in acute postpartum hemorrhage was reported decreasing it 1.2 to 0.2. (10) A 16.5% decline in rate of postpartum hemorrhage was reported in the study group by Mobeen et al, while it was greater in control group i.e. 21.9%. [17] A study from Bangladesh reported the occurrence at postpartum hemorrhage to be 1.6% participating women after misoprostol was administered. [12] Two of the studies carried out in Pakistan and Iran, reported 16.5% to 19% of the cases with misoprostol induced postpartum haemorrhage [1], [13] while 45% women developed PPH due to misoprostol in Africa. [14] Hashima-E-Nasreen *et al* reported the incidence rate of primary postpartum hemorrhage to be 1.6% in study participants in contrast to 6.2% in control participants. Misoprostol reduced the risk of primary postpartum hemorrhage 81% in study group while control patients were required to refer them to emergency and blood transfusion. [18]

In India, a placebo trial study was carried out on 1620 female subjects. Oral administration of misoprostol to 50.1% study participants reduced the rate of occurrence of acute postpartum hemorrhage up to 12 against the placebo group participants where misoprostol was given after the delivery and 6% decline in occurrence of acute postpartum hemorrhage was noted as described by Derman *et al*. A further 20% decline in acute severe postpartum hemorrhage was reported decreasing it from 1.2 to 0.2. [10]

A large scale randomized trial-based study from Pakistan evaluated the efficacy of misoprostol to reduce the occurrence of postpartum hemorrhage. Out of a total 1119 study subjects 534 participants received the standard oral dose of drug after the delivery at home. On the other hand, 534 females received placebo dose. The oral administration of misoprostol reduced the rate of postpartum hemorrhage significantly from 21.9% against 16.5% in study participants as per reported by Mobeen *et al* in year 2008.

Meta-analysis on the outcome of above mentioned three large scale studies expedite thatoral administration of misoprostol reduced the rate of occurrence of severe postpartum hemorrhage to 41% and postpartum hemorrhage by 24% in contrast to placebo patients. [19] Ayyad et al reported the occurrence rate of postpartum hemorrhage in 7% study subjects out

of 663 those were given rectal administration of 400 mcg dose of misoprostol or other uterotonic agent e.g. oxytocin with a dose of 10 I.U intramuscularly after they delivered the baby. The results were comparable in both study groups at both stages i.e. before the delivery and after 72 hours of it. It was abridged that rectal administration of misoprostol has same protective effect against postpartum hemorrhage as the parenteral administration of oxytocin. [20]

Leon *et al* in their study reported that a sublingual dose of 600 microgramof misoprostol alone reduced the occurrence of postpartum hemorrhage in 82% of study participants after the 20 minutes the drug was given. A small volume of blood loss was recorded in study subjects all with a good level of hemoglobin after they were given the drug. [21]

## Conclusion

The incidence of postpartum hemorrhage is very low in women those undergo for normal vaginal delivery after they are given the misoprostol. A small volume of blood loss occurs in such cases. Now we can implement use of misoprostol for prevention of PPH after normal vaginal delivery.

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