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Compare the Mean Blood Loss of Sublingual Misoprostol vs Intravenous Oxytocin for Management of 3rd Stage of Labor

Sidra Anam[1], Fouzia Baluch[2], Zaib un Nisa[3], Shafaq Hanif[4], Faiza Murtaza[5], Maryum Noor Malik[6]

[1]Consultant Gynecologist, Tehsil Headquarter Hospital (THQ) Hazro, Dist. Attock
[2]Consultant Gynecologist, Shareef Medical Centre, Multan, [3]Consultant Gynecologist, Royal Medical Centre, DG Khan
[4]Professor, Department of Obstetrics and Gynecology, Azad Jammu and Kashmir Medical College, Muzaffarabad,
[5]Consultant Gynecologist, Ahmed Medical Complex, Rawalpindi,
[6]Senior Registrar, Shifa International Hospital, Islamabad

Author`s Contribution

[1,2]Substantial contributions to the conception or design of the work or the acquisition, methodology, analysis [3,5]Final approval of the version to be published. [4]Active Participation in active, [6]Drafting the work or revising it critically for important intellectual content

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Address of Correspondent
Dr. Sidra Anam
Consultant Gynecologist, Tehsil Headquarter Hospital (THQ) Hazro, Dist. Attock
sidraanwer1991@gmail.com

ABSTRACT

Objectives: To compare the mean blood loss when using sublingual misoprostol vs intravenous oxytocin for managing the 3rd stage of labor.

Methodology: This comparative randomized controlled trial took place at the Department of Obstetrics & Gynecology, Benazir Bhutto Hospital, Rawalpindi, from August 2022 to February 2023. Sixty (n=60) women with singleton pregnancies and cephalic presentations, aged 18 to 40 years, were included. The patients were randomly divided into two equal groups (each, n=30). In the Group A, patients were given sublingual misoprostol tablets 200µg each. However, in the Group B patients, 10 IU of intravenous oxytocin was given after delivery of the baby. Following all deliveries in both groups, blood loss was measured. The comparison of mean blood loss between both groups was analyzed using an independent t test, with a $p \leq 0.05$ for determining significance.

Results: The mean age of women was 29.2±6.1 years. The majority patients, 58.3%, were aged between 20 and 30 years. The mean gestational age among women was 39.0±1.5 weeks. The mean postpartum blood loss was 119.0±20.3 ml in Group A (sublingual misoprostol) and 154.1±15.2 ml in Group B (intravenous oxytocin) ($p = 0.0001$).

Conclusion: Sublingual misoprostol results in lower mean postpartum blood loss compared to intravenous oxytocin for management of the 3rd stage of labor.

Keywords: Administration, Sublingual; Misoprostol; Oxytocin; Postpartum hemorrhage.

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Introduction

The 3rd stage of labor is traditionally described as the time between the baby's delivery to the delivery of placenta along with membranes.[1] The duration of 3rd stage of labor, along with its potential complications, is influenced by both the time taken for placental separation and the contraction of the uterine muscle.[2] The management of 3rd stage of labor, involving the administering uterotonic agent upon delivery of the baby's anterior shoulder or within one minute of neonatal delivery, along with early clamping of cord and traction of placenta, are definitively proven effective than expected management in decreasing the risk of postpartum hemorrhage (PPH).[3,4]

The general assumption is that by preventing and treating PPH, most deaths associated with PPH could be avoided. Preventing and treating PPH are crucial measures for enhancing women's healthcare during childbirth and achieving the Millennium Development Goals.[5] To achieve these goals, healthcare workers in developing countries should have access to suitable medications and receive training in procedures relevant to managing PPH.[6,7]

Uterotonics stimulate uterine contractions to prevent uterine atony and expedite the delivery of the placenta. Common causes of PPH include inadequate uterine contraction after birth, which can result in atonic PPH, genital tract injury leading to traumatic PPH, and bleeding

due to retained placental tissue.[5] Atonic PPH is the primary cause of PPH and the leading contributor to maternal mortality. Although oxytocin is the recommended drug of choice, ergometrine has comparable efficacy but is associated with more side effects.[6] Nevertheless, ergometrine is a well-established medication and should be employed in situations where oxytocin is unavailable.[7] Misoprostol, a prostaglandin analogue, exhibits potent uterotonic effects. Unlike other prostaglandins, it is comparatively affordable and remains stable at room temperature.[8] These characteristics have generated significant interest in the medication as a cost-effective approach for preventing and managing PPH in developing nations.[9]

In our general practice, there is an ongoing debate regarding the optimal method for managing the 3rd stage of labor to minimize blood loss. Although there are previous studies on this subject, they have produced contradictory findings, making it difficult to conclude which medication is superior. Some studies have indicated that sublingual misoprostol is superior, while others have found no significant difference between the methods. Therefore, a reevaluation of the results is warranted. The objective of this study was to compare the mean blood loss when using sublingual misoprostol vs intravenous oxytocin for managing the 3rd stage of labor.

Methodology

This comparative randomized controlled study took place at the Department of Obstetrics & Gynecology, Benazir Bhutto Hospital, Rawalpindi, from August 2022 to February 2023. Sixty (n=60) women with singleton pregnancies and cephalic presentations, aged 18 to 40 years, were enrolled. The sample was determined using WHO calculator, with a confidence level 95%, an alpha error 5%, and a test power 80%. The mean amount of blood loss was 205.6±34.8 ml with IV oxytocin and 168.4±24.8 ml with sublingual misoprostol.[10] The non-probability consecutive sampling was used. Singleton pregnancies with cephalic presentation (confirmed by ultrasound) underwent vaginal delivery and in the 3rd stage of labor, gestational age between 37 and 41 weeks (assessed by last menstrual period) and parity between 1 and 5 were included. Multiple pregnancies (confirmed by ultrasound), women who underwent instrumental delivery or cesarean section, those with bleeding disorders (INR > 1.5), gestational diabetes mellitus (> 110 mg/dl fasting sugar during pregnancy), and pregnancy induced hypertension (blood pressure > 130/90 mmHg on two consecutive occasions after 20 weeks of gestation) were excluded.

After obtaining ethical committee hospital approval and from every patient informed consent was acquired. The biodata and demographic information (age) of each patient were recorded. Women who attended regular antenatal visits or presented at the time of labor were also recorded. Ultrasonography was conducted by a consultant radiologist to confirm singleton pregnancies with cephalic presentation. Patients were randomly assigned to two groups (each, n=30) using a lottery method. All patients were given the opportunity to select a slip from a total mix of slips, where half contained the letter 'A' and the other half contained the letter 'B', determining their placement in the respective group.

In Group A, patients were administered sublingual misoprostol suppositories, each containing 200µg. In Group B, patients given 10 IU of intravenous oxytocin immediately after baby's delivery. The researcher conducted all deliveries in both groups, measuring blood loss by collecting blood in gauze pieces and subtracting the pre-weight of the gauze pieces from the post-delivery weight, with 1g considered equivalent to 1ml.

All data were analyzed using SPSS v 25. Quantitative variables (ages and blood loss) were measured by mean ± SD. Qualitative parameters were measured by frequency and percentage. The comparison of mean blood loss between both groups was analyzed using an independent t test, with a $p \leq 0.05$ for determining significance. Effect modification was done by stratified analysis, and an independent t test was used after stratification.

Results

Sixty (n=60) women with singleton pregnancies and cephalic presentations were enrolled in this study. Mean age of women was 29.2±6.1 years. Majority patients, 58.3%, were aged between 20 and 30 years. The mean gestational age among women was 39.0±1.5 weeks. The distribution of patients according to age, gestational age, parity, and regular antenatal visits in both groups is summarized in Table I.

The mean blood loss in Group A (sublingual misoprostol) was 119.0±20.3 ml, while in Group B

Table I: The distribution of parameters in both groups, n=60

Parameters		Group A (n=30)	Group B (n=30)	Total	p value
Ages (yrs)	Mean ± SD	29.3±5.9	29.1±6.3	-	1.00
Age categories (yrs)	18 – 30	16 (53.3%)	19 (63.3%)	35 (58.3%)	.127
	31 – 40	14 (46.7%)	11 (36.7%)	25 (41.7%)	
Gestational age (wks)	Mean ± SD	39.0±1.5	39.0±1.5	-	1.00
Parity	≤ 2	5 (16.7%)	5 (16.7%)	10 (16.7%)	.001
	> 2	25 (83.3%)	25 (83.3%)	50 (83.3%)	
Regular antenatal visits	Yes	11 (36.7%)	12 (40%)	23 (38.3%)	.114
	No	19 (63.3%)	18 (60%)	37 (61.7%)	

(intravenous oxytocin), it was 154.1±15.2 ml, as illustrated in Figure I (p = 0.0001).

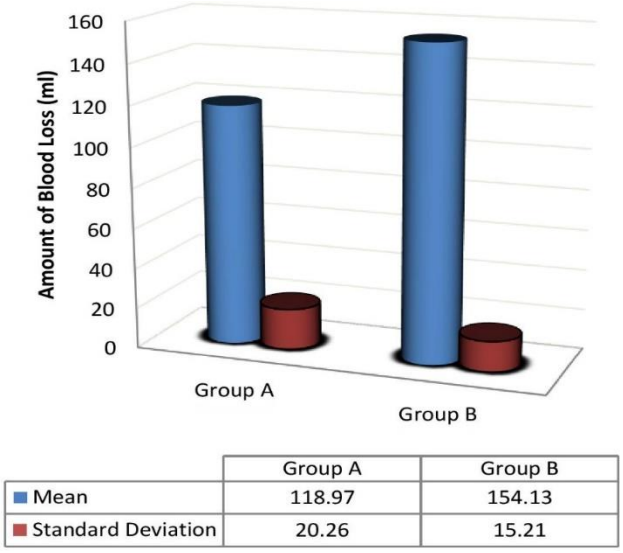

Figure I. The mean blood loss in each group.

The mean postpartum blood loss stratified with age, parity, and regular antenatal visits in both groups is summarized in Table II.

Table II: Stratifications of parameters in each group, (n=60)

Variables		Group A	Group B	p-value
		Blood loss (ml)		
		Mean ± SD	Mean ± SD	
Ages (yrs)	18 – 30	121.7±17.3	155.3±15.3	.0001
	31 – 40	115.9±23.5	152.1±15.5	.0001
Parity	≤ 2	122.0±16.8	169.2±15.2	.0001
	> 2	118.4±21.1	151.1±14.8	.0001
Antenatal visits	Yes	118.8±24.7	155.4±14.2	.0001
	No	119.1±18.0	153.3±16.2	.0001

Discussion

The mean blood loss was compared in patients using sublingual misoprostol with those using intravenous oxytocin for management of 3rd stage labor in this study. Mean blood loss was low in patients using sublingual misoprostol. Mean postpartum blood loss was 119.0±20.3 ml in Group A (sublingual misoprostol) and 154.1±15.2 ml in Group B (intravenous oxytocin) (p = 0.0001). These findings are consistent with a study conducted in Saudi Arabia, where the average amount of blood loss was 182.4±101.3 ml with oxytocin versus 157.0±84.9 ml with misoprostol.[11] A study conducted in Lahore, Pakistan, demonstrated a lower postpartum blood loss in patients using sublingual misoprostol compared to those using intravenous oxytocin (168.4±24.8 ml versus 205.6±34.8 ml), which is consistent with our study.[12]

Othman et al demonstrated that mean blood loss was low in misoprostol group compare to oxytocin group (490.8±159.9 ml vs. 601.1±299.5 ml; p = 0.025), which is similar with findings of this study.[13] Another study demonstrated that mean blood loss in misoprostol was 192±124 ml compared to 366±136 ml in oxytocin (p ≤ 0.001). PPH frequency in misoprostol was 3% and in oxytocin was 9% (p = 0.002).[14] These results align with the findings of this study, indicating that misoprostol is superior in minimizing blood loss compared to intravenous oxytocin.

However, there are also studies that show contradictory results. A study comparing rectally administered misoprostol to conventional IM oxytocin for PPH prophylaxis found no difference between groups in reducing the incidence of PPH. Consequently, the study suggests that rectally administered misoprostol may be an effective alternative to conventional IM oxytocin for preventing PPH.[15] Similarly, in a trial, women who had uncomplicated vaginal deliveries were given either 400µg of rectal misoprostol or 10IU of IM oxytocin after baby's delivery. The study did not identify any notable variances in hemoglobin levels between the groups pre- and post-delivery.[16]

Multiple studies indicate improved control of postpartum blood loss in patients using sublingual misoprostol compared to intravenous oxytocin. Nevertheless, some studies contradict these results.

This study proposes that additional research should be undertaken to achieve more dependable and effective outcomes regarding the utilization of misoprostol and oxytocin.

Conclusion

This study concluded that sublingual misoprostol results in lower mean postpartum blood loss compared to intravenous oxytocin for management of 3rd stage labor. Misoprostol should be added as first-line drug for management of 3rd stage labor. It is superior than oxytocin, resulting in lower postpartum blood loss.

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