International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 8, August 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.8.2024.33

ORIGINAL RESEARCH

Comparison of sublingual misoprostol and intravenous oxytocin in the prevention of post-partum haemorrhage after caesarean delivery: A Randomized control trial

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Received Date: 24 June, 2024 Acceptance Date: 22 July, 2024

ABSTRACT

Background: Postpartum haemorrhage (PPH) is one of the commonest causes of maternal morbidity and mortality. It has been believed that an active way for stopping PPH is active managing of third stage of labor. **Aim:** The aim of this study was to compare the sublingual misoprostol and intravenous oxytocin in the prevention of post-partum haemorrhage after caesarean delivery. **Methods:** The present Randomized control trial was conducted to compare the effectiveness of sublingual misoprostol 3 dose for prevention of PPH in patient with caesarean delivery. A total 120 subjects were divided into 6 groups namely 400µg, 600µg, & 800µgSublingual Misoprostol and 10IU, 15IU, &20IU intravenous Oxytocinimmediate after opening the peritoneum. **Results:** The minimum blood loss was observed in 20 unit intravenous oxytocin group and the maximum blood loss, haemoglobin level and total haematocrit value loss was in 400µg sublingual misoprostol group.($p>0.05$).while increase the dose of Sublingual misoprostol, reduce the duration of the 3rd stage of labor ($p<0.05$); while in case of intra venous oxytocin it was insignificantly reduced ($p>0.05$).The increased incidence of side effects (like shivering, fever, Abdominal Pain, Nausea &vomiting, Hypotension and Tachycardia) with increase dose of sublingual misoprostol and oxytocin. **Conclusions:** The effectiveness of sublingual misoprostol is similar to intravenous oxytocin in preventing postpartum hemorrhage (PPH) after cesarean delivery and reduces the need for additional uterotonic agents. These findings suggest that lower doses of misoprostol or oxytocin may be as effective as higher doses, but the severity of adverse effects increases with higher doses.

Keywords: Postpartum, Oxytocin, Misoprostol, Haemorrhage, Caesarean.

INTRODUCTION

Postpartum haemorrhage (PPH) is the leading cause of maternal mortality in the developing world and is responsible for about 25% of all maternal deaths worldwide.[1] Postpartum haemorrhage (PPH) accounts for almost 30% of all maternal deaths in low-income countries.[2] Active management of 3rd stage of labor (AMTSL)—comprising administration of a uterotonic at delivery of the anterior shoulder or within a minute of delivery of the neonate, early cord clamping, and controlled cord traction of the placenta—has been proven conclusively in several large-scale randomized controlled studies to be more effective than expectant management in reducing PPH.[2] Limited access to skilled obstetric care services is the key factor responsible for the higher maternal morbidity and mortality in low-resource settings. Therefore, there is an acute need for universal adoption of AMTSL to decrease the incidence of PPH.[2]

Postpartum haemorrhage (PPH) is life-threatening obstetric emergency which occurs after cesarean section (CS) or the normal vaginal delivery (NVD). It might be defined as ≥500mL haemorrhage after vaginal or ≥1000mL haemorrhage after CS delivery.[3] PPH is amongst commonest obstetric maternal

DOI: 10.69605/ijlbpr_13.8.2024.33

complications, and is among 3 most common aetiologies of maternal death worldwide.[4]

The most common cause of PPH is the failure of the uterus to contract after childbirth (atonic PPH) and active management of 3rd stage of labour is recommended to prevent this.[5,6] This involves, as a minimum, the administration of uterotonic drug at delivery and controlled cord traction. Oxytocin is routinely used to prevent uterine atony and excessive uterine bleeding during caesarean delivery. How ever, despite its effectiveness, 10–40 % of women need additional uterotonic therapy.[7]However, oxytocin requires refrigeration because it is unstable when exposed to high ambient temperatures. Furthermore, this drug must be given parenterally, which requires a skilled birth attendant and a continuous supply of sterile syringes and needles. Both of these are frequently unavailable in low-resource settings. About 99.0% maternal deaths happen in low-resource settings where there are poor transportation systems and a lack of skilled birth attendants and emergency obstetrics services.[8] Hence, a major objective for reducing maternal deaths in poor areas is to find low-cost, effective ways to prevent and control PPH.

Misoprostol is a prostaglandin E1 analogue with good uterotonic properties and few adverse effects at therapeutic dose. Because of its uterotonic properties, misoprostol been evaluated for both prevention and treatment of PPH.[9]When administered orally, sublingually, buccally, vaginally, or rectally, it is easily absorbed. Its wide availability, affordability, extended shelf life, thermostability, and simplicity of administration seem to make it especially well-suited for usage in low-resource environments in developing nations. While misoprostol has been widely studied for its ability to prevent and treat postpartum haemorrhage after vaginal delivery, a small number of randomised controlled trials have assessed its ability to lessen intraoperative blood loss and the need for additional uterotonic therapy during caesarean delivery. In these studies, misoprostol was given orally, buccally, or sublingually. It was mostly compared with oxytocin given as an intramuscular/IV bolus, IV infusion, or intrauterine injection, or with a placebo. The majority of these trials revealed misoprostol to be as successful as oxytocin, and in one case even more so, despite the large variations in the amount of misoprostol employed in them.[10.11]

The present study aimed to the comparison of sublingual misoprostol and intravenous oxytocin in prevention of post-partum haemorrhage after caesarean delivery.

MATERIAL & METHODS

The present randomized control trial was conducted to compare the effectiveness of sublingual misoprostol 3 dose for prevention of PPH in patient with caesarean delivery. The study was done in the department of Obstetrics and Gynaecology, Lord Buddha Koshi medical college and hospital, Saharsha, Bihar, India in collaboration with department of Pharmacology, RMCH, Bareilly. Women between ages 18-35 years, scheduled for primary caesarean delivery and with gestational age >34 weeks were enrolled in this study. Women discharged before 24 hours of delivery, history of PPH, history of Antepartum haemorrhage (APH), previous caesarean section, anaemia (Hb <10g/dl), pre-eclampsia/ HELLP syndrome, Polyhydramnios (Amniotic fluid index more than 24) and with infection were excluded from the study.

Collection of Blood

- After the approval from institutional ethics committee, study was started. Study subjects were included and excluded from the study with reference to our inclusion / exclusion criteria.
- Total included subjects were divided into 6 groups namely M400, M600, M 800, O10, O15 and O20. M400 group received 400 ug of sublingual Misoprostol. M600 group received 600ug of sublingual Misoprostol and M800 received 800 ug of sublingual Misoprostol whereas O10 group was given10IU of Oxytocin, O15 group received 15 Unit of Oxytocin and O20 received 20 units of Oxytocin immediate after opening the peritoneum.
- Total blood loss in the initial 24 hours was estimated by two methods.
- The first one was the measurement of the volume component of blood, which was the measurement of blood volume collected in a suction canister after the delivery of the baby.
- The second one was the mass component, which was estimated by measuring the blood-soaked under-buttock blood adsorbing pads, blood-soaked mops, blood-soaked gauze pieces and blood-soaked towels and sanitary pad used for the initial 24 hours of delivery.
- The weight of blood was determined by subtracting the dry weight of the adsorbing material from the wet weight of subsequent materials. Volume was determined on the basis that 1 gram is equivalent to 1 ml of blood.
- A 5 ml venous blood sample was collected from all the selected subjects for the measurement of haemoglobin and haematocrit value before and after 24 hours of the start of the procedure to see the changes.
- Neonatal weight was measured soon after delivery and recorded.
- Blood was collected up to 24 hours after birth, and its volume was noted.
- Adverse symptoms such as nausea, shivering, fever, hypotension, and tachycardia were evaluated in all patients upto 24 hours of surgery, and the findings were documented.

Mean and standard deviation (±SD) were used to describe quantitative data meeting normal distribution. Continuous two independent groups were compared by parametric independent Paired t test or

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One Way ANOVA t test. Discrete (categorical) groups were compared by chi-square ($\chi 2$) test. p values less than 0.05 ($p<0.05$) was considered as statistically significant and $P\leq 0.01$ was considered as highly significant.

OBSERVATION & RESULTS

The total blood loss >500ml was recorded in the 35.0% cases in 600µg, 15.0% in400µg and 10.0% cases in 800µg in Sublingual Misoprostol group; while 25.0% in 10 unit and 10.0% cases in 15-unitand 20unit intra venous Oxytocin group total blood loss >500ml was noted. But 10.0% case in 400µg Sublingual Misoprostol group and 5.0% case in 600µgSublingual Misoprostol, 800µgSublingual Misoprostol group, 10unit and 15unit Intra venous Oxytocin group total blood loss was >1000ml. The minimum blood loss was observed in 20unit intravenous oxytocin group and the maximum blood loss was in 400µg sublingual misoprostol group. be similar amount of total blood loss in 800µg in sublingual misoprostol and 15unit intravenous Oxytocin group was found. And 600µg Sublingual Misoprostol group was also comparable total blood loss with 10unit intravenous oxytocin group [**Figure 1**]. Below table shows an intra group comparison of total blood loss with different dosage of sublingual misoprostol and intravenous oxytocin. We noted that higher dosage of sublingual Misoprostol (800ug) and oxytocin (20 units) tend to have lower mean blood loss as compared to lower dosage but these differences are not statistically significant. So these differences might not be clinically relevant. ($p>0.05$) **[Table 1]**.

The mean ± SD decline in haemoglobin level loss after 24 hours of delivery was 1.50%±0.74% in 400µg misoprostol group, 1.31±0.63 in 600µg misoprostol group, 0.92±0.41 in 10unit intravenous Oxytocin group, 0.74±0.31 in 15-unit intravenous Oxytocin group, 0.69±0.29 in 800µg misoprostol group and 0.49±0.23 in 20unit intravenous Oxytocin group. By using the paired t test we noted that there was significantly reduce the post-operative haemoglobin level loss in several groups in compare to pre-operative ($p<0.05$) **[Table 2]**.

The mean ± SD decline in haematocrit level loss after 24 hours of delivery was 2.85%±1.31% in 400µg misoprostol group, 3.45%±1.50% in 10unit intravenous Oxytocin group, 2.40±1.35% in 600µg misoprostol group, 2.15±0.99% in 800µg misoprostol group, 1.35±0.99% in 15-unit intravenous Oxytocin group, and 0.80±0.83% in 20unit intravenous Oxytocin group. By using the paired t test, we noted that there was significantly reduce the post-operative haematocrit level loss in several groups in compare to pre-operative ($p<0.05$).But by using the One Way ANOVA test we noted that there was insignificant difference in the total haematocrit value loss with different doses of Sublingual misoprostol and Intra venous Oxytocin **[Table 3]**.

In bellow table we noted that increase the dose of Sublingual misoprostol we reduce the duration of the 3rd stage of labor ($p<0.05$); while in case of intra venous oxytocin it was insignificantly reduced ($p>0.05$). But Intra-group paired t test compare it was statistically insignificant ($p>0.05$) **[Table 4]**.

The incidence of fever after delivery in 800µg sublingual misoprostol group was 20.0%, followed by 15.0% in 20unit intravenous Oxytocin group, 10.0% in 15-unitintravenous Oxytocin group, 5.0% in 10unit intravenous Oxytocin group, 10.0% in 600µgsublingual misoprostol group and only 5.0% in 400µgsublingual misoprostol group. Out of 20 patients, 35.0% cases also in 20-unit intravenous oxytocin group were showing shivering followed by 5 patients (25 .0%) in 800µg sublingual misoprostol group and 15.0% cases in 600µg sublingual misoprostol group. We also noted that there increase the doses of sublingual misoprostol and intravenous oxytocin shows the more adverse drug reaction. Abdominal Pain and Nausea &vomiting was common adverse reaction in higher dose of intravenous oxytocin and as well as sublingual misoprostol groups. Hypotension was noted in 15.0% patients in 20unit intravenous Oxytocin group and 10.0% in 15unit intravenous Oxytocin group; but it was found that 10.0% in 800µg sublingual misoprostol group and 5.0% patients in 600µg sublingual misoprostol group. There were no any patients showing the hypotension in 400µg sublingual misoprostol group and 10unit intravenous Oxytocin group. Tachycardia was observed in 15.0% patients in 800µg and 10.0% in 600µg sublingual misoprostol group, while in 10.0% 20unit and 15unit intravenous Oxytocin group. There was no tachycardia in rest other sublingual misoprostol and intravenous Oxytocin group. In this study individual type of side effects were insignificantly increases with rise dose of either sublingual misoprostol or intravenous Oxytocin group ($p>0.05$) **[Table 5]**.

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Figure 1: Distribution of cases on the basis of >500ml and >1000ml blood loss

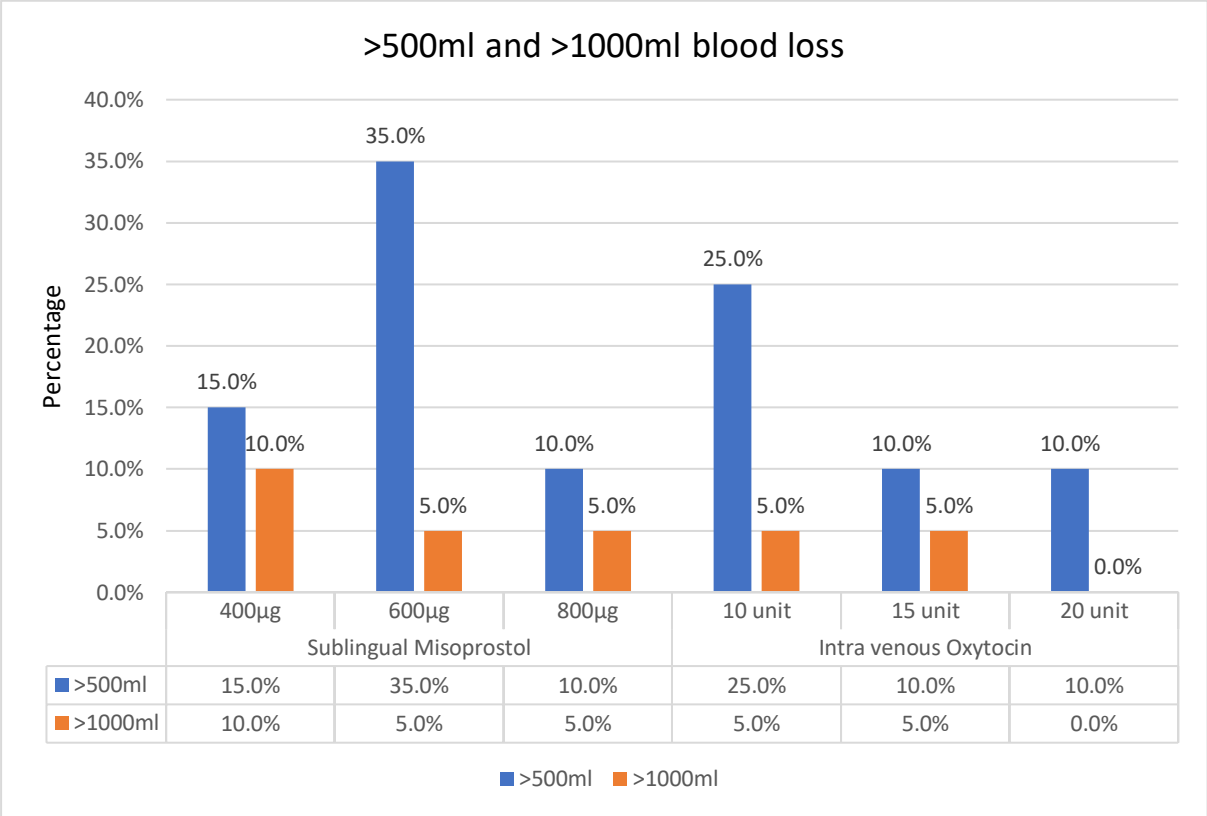

Table 1: Intra group comparison of total blood loss with different doses of Sublingual misoprostol and Intra venous Oxytocin

Drug	Compare Dose	Total Blood Loss (Mean±SD)	P value*
Sublingual Misoprostol	**400µg**	507.00±308.97	--
	600µg	452.00±306.62	0.575
	800µg	397.00±234.23	0.212
P value#		0.480	
Intra venous Oxytocin	**10unit**	496.50±262.05	--
	15unit	419.00±215.43	0.313
	20 unit	364.00±209.37	0.085
P value#		0.197	

***Paired t test; #One Way ANOVA**

By using Paired t test, we compared 400ug sublingual Misoprostol with 600ug Misoprostol and 400ug misoprostol with 800ug misoprostol, and found p-value as 0.575 & 0.212 respectively. And by comparing 10 unit oxytocin with 15 unit &20 Unit oxytocin, p-value was 0.313 & 0.085 which are statistically non significant

Table 2: Compare the total haemoglobin level loss with different doses of Sublingual misoprostol and Intra venous Oxytocin.

Drug	Dose	Frequency (n=120)	Pre-operative	Post-operative	P value*
Sublingual Misoprostol	**400µg**	20	10.12±1.33	8.61±1.46	**<0.001**
	600µg	20	10.14±1.64	8.83±1.49	**<0.001**
	800µg	20	10.35±1.70	9.66±1.77	**<0.001**
P value#			0.876	0.095	
Intravenous Oxytocin	**10 unit**	20	10.26±1.47	9.34±1.51	**<0.001**
	15 unit	20	10.01±1.30	9.26±1.28	**<0.001**
	20 unit	20	10.06±1.45	9.56±1.52	**<0.001**
P value#			0.839	0.793	

***Paired t test; #One Way ANOVA**

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Table 3: Compare the total haematocrit value loss with different doses of Sublingual misoprostol and Intra venous Oxytocin.

Drug	Dose	Frequency (n=120)	Pre-operative	Post-operative	P value*
Sublingual Misoprostol	**400µg**	20	33.90±3.96	31.05±3.73	**<0.001**
	600µg	20	33.20±3.64	30.80±3.89	**<0.001**
	800µg	20	33.30±4.52	31.15±4.43	**<0.001**
P value#			0.841	0.961	
Intra venous Oxytocin	**10 unit**	20	33.75±4.02	30.30±4.22	**<0.001**
	15 unit	20	33.40±4.35	32.05±4.84	**<0.001**
	20 unit	20	33.35±5.12	32.55±5.62	**<0.001**
P value#			0.955	0.324	

***Paired t test; #OneWay ANOVA**

Table 4: Inter and Intra group comparison of average duration of 3rd stage of labour with different doses of Sublingual misoprostol and Intra venous Oxytocin.

Drug	Sublingual Misoprostol		Intra venous Oxytocin		P value*
	Dose	Mean±SD	Dose	Mean±SD	
Duration of the 3rd stage of labor (min)	**400µg**	7.12±1.31	**10 unit**	6.50±1.92	0.240
	600µg	6.63±2.13	**15 unit**	6.02±1.98	0.354
	800µg	5.55±1.77	**20 unit**	5.06±1.83	0.395
P value#		**0.021**		0.061	

***Paired t test; #One Way ANOVA**

Table 5: Adverse drug reactions with different doses of Sublingual misoprostol and Intra venous Oxytocin

	Sublingual Misoprostol			Intra venous Oxytocin		
	400µg	**600µg**	**800µg**	**10 unit**	**15 unit**	**20 unit**
Fever	1 (5.0%)	2 (10.0%)	4(20.0%)	1 (5.0%)	2 (10.0%)	3 (15.0%)
P value	0.322			0.574		
Shivering	2 (10.0%)	3 (15.0%)	5 (25.0%)	2 (10.0%)	4 (20.0%)	7 (35.0%)
P value	0.432			0.155		
Abdominal Pain	0 (0.0%)	3 (15.0%)	5 (25.0%)	1 (5.0%)	2 (10.0%)	3 (15.0%)
P value	0.065			0.574		
Nausea and vomiting	1 (5.0%)	4 (20.0%)	3 (15.0%)	0 (0.0%)	2 (10.0%)	4(20.0%)
P value	0.364			0.108		
Hypotension	0 (0.0%)	1 (5.0%)	2 (10.0%)	0 (0.0%)	2 (10.0%)	3 (15.0%)
P value	0.349			0.217		
Tachycardia	1 (5.0%)	2 (10.0%)	3 (15.0%)	1 (5.0%)	2 (10.0%)	2 (10.0%)
P value	0.574			0.778		

***chi Square test**

DISCUSSION

Most delivery units use oxytocin intravenously or as an infusion to prevent atonic uterus and hemorrhage during and after a cesarean procedure, which causes tachycardia, hypotension, and negative inotropic effect and has an antidiuretic action. Approximately, 10% to 40% of these patients will need additional uterotonic drugs.

Few researches have evaluated the negative effects of intravenous oxytocin and sublingual misoprostol on lowering PPH following caesarean sections. In various studies, misoprostol was used in different ways and doses (400 -800 µg, per oral, buccal, sublingual or rectal) to control hemorrhage and different results have been reported.[12]However, most studies were conducted on vaginal delivery,[13,14] and few in cesarean section patients.[15] The doses or methods were not similar in our study, which is the innovation aspect of this study.

Our study is aimed at finding the effect of dose of 400, 600 and 800µg of sublingual misoprostol compared to 10, 15 and 20 units of intravenous oxytocin in Ringer-lactate to reduce PPH and its adverse effects after cesarean delivery. **Rahbar N et al[16]**conducted a single blind randomized clinical trial of the comparison of sublingual misoprostol and intravenous oxytocin in the management of postpartum hemorrhage after cesarean delivery and concluded that the effectiveness of sublingual Misoprostol and intravenous oxytocin had comparable effects in lowering caesarean section haemorrhage. Furthermore, they advise against using excessive dosages of sublingual misoprostol since patients found shivering to be an extremely uncomfortable untreatable side effect. **Singh G et al[2]**compared the effects of sublingual misoprostol, intravenous oxytocin, and intravenous methylergometrine in a double-blind, randomized trial to actively manage the

DOI: 10.69605/ijlbpr_13.8.2024.33

third stage of labour. The results showed that 600µg of sublingual misoprostol was more effective for AMTSL than 400µg of misoprostol, intravenous oxytocin, and intravenous methylergometrine. **Sood AK & Singh S**[17]prospective randomized placebo-controlled experiment to test the efficacy of sublingual misoprostol in reducing blood loss during caesarean birth. The results showed that the drug is effective in reducing intraoperative blood loss and the requirement for extra uterotonic agents during caesarean delivery. **Chaudhuri P et al**[18] conducted a randomized, placebo-controlled, double-blind prospective trial of the rectally administrated misoprostol as an alternative to intravenous oxytocin infusion for preventing post-partum hemorrhage after cesarean delivery and concluded that the rectally administrated 800-mg misoprostol may be an effective alternative to oxytocin infusion to prevent PPH after cesarean delivery.

In our study women with history of PPH, history of Antepartum haemorrhage (APH), previous caesarean section, Women with pre-eclampsia/ HELLP syndrome, Women with Polyhydramnios (Amniotic fluid index more than 24), Women with Fetal Macrosomia (Estimated fetal weight above 4000 gm) and with infection were excluded from the study. **Rahbar N et al,**[16]**Singh G et al,**[2]**Sood AK & Singh S**[17]and **Chaudhuri P et al**[18]also opted similar selection/rejection criteria in their respective study.

The present study noted that the men age of studied women was 25.53±3.36 years with age range 20 to 35 years. Majority of the study cases (57.5%) were belonging to 20-25 years age group, followed by 26-30 years age group was 37.5% and >30 years age group was only 5.0%. 55.0% cases were belonging to lower middle and middle socioeconomic status. Housewives were 93.3% women and 53.3% were matric pass. Living in rural area was 67.5% women and 63.3% with nuclear type of family. The mean height and weight of studied women was 154.71±3.96 cm and 69.41±5.59 kg respectively. The mean body mass index (BMI) of studied women was 29.03±2.45 kg/m^2 with range 23.80 to 33.0 kg/m^2. There were 53 pregnant women out of 120 studied pregnant women was nulli parity and average parity was 0.92±1.04 with minimum 0 to maximum 4 parity. Maximum cases (90.0%) were belonging to the 35-39 weeks gestational age and mean gestational age was 37.58±1.42 weeks. Our demographic, clinical and obstetric characteristics were supported by previous studies conducted by **Rahbar N et al,**[16]**Singh G et al,**[2]**Sood AK & Singh S**[17]and **Chaudhuri P et al.**[18]There was age, socioeconomic status parity, occupation, education level, living area, type of family, height, weight, BMI, and gestational age were similar in the six groups.

Present study noted the more than 1000 ml and 500 ml total blood loss in more cases of Sublingual Misoprostol group in compare to Intra venous Oxytocin group. The average total blood loss was higher in Sublingual Misoprostol group in comparison to Intra venous Oxytocin group. The maximum volume of total blood loss was in 400µg Sublingual Misoprostol group and minimum blood loss was in 800µg Sublingual Misoprostol group. 600µg sublingual Misoprostol was comparable to 15unit Intra venous Oxytocin; and 400µg Sublingual Misoprostol was almost equal to 10units Intra venous Oxytocin. Similar previous studies were comparable to present study. **Zhao et al**[10]researchers observed that misoprostol was more successful in reducing postpartum haemorrhage when they compared 600 µg oral misoprostol with oxytocin (20 U intrauterine plus 20 U IV). **Acharya et al**[7]when 400 µg of oral misoprostol and 10 U of intravenous syntocinon were compared for their ability to reduce intraoperative blood loss, misoprostol was shown to be equally effective. **Lokugamage et al**[19]tested 10 U IV Syntocinon with 500 µg oral misoprostol and found that oral misoprostol might be utilised as a substitute oxytocic medication. **Hamm et al**[20]placebo-controlled trial found that the requirement for further uterotonic drugs was decreased when 200 mcg of buccal misoprostol was used. In another study comparing 400µg sublingual misoprostol vs 20U oxytocin infusion;**Vimala et al**[15] found sub-lingual misoprostol as effective as oxytocin. In placebo-controlled study, comparing 800µg oral misoprostol with 20U oxytocin infusion after the initial administration of 5U of IV-oxytocin, **Lapaire et al**[11]found misoprostol as effective as oxytocin in reducing post-operative blood loss. **Ahmed AA et al**[21]reported that the intra-operative and 2h post-operative blood-loss in misoprostol group was higher than oxytocin group ($p<0.001$).**Othman ER et al**[22]reported that the mean blood loss was significantly lower in the misoprostol group compared to the oxytocin group (490.75 ± 159.90 mL vs. 601.08 ± 299.49 mL; p=0.025).

While **Sood AK & Singh S**,[17]**Zhao et al**[10]and**Vimala et al**[15] reported the mean intra-operative blood loss was significantly less in misoprostol group. However, **Acharya et al,**[7]**Hamm et al**[20]and **Lapaire et al**[11] studies have reported there were no difference intraoperative mean blood loss. Blood loss at cesarean is difficult to assess accurately. In a study, **Patel A et al**[23] reported that the visual assessment of blood loss was 33 % less than the drape estimate; with the drape estimate correlating well with photo spectrometry. In this study to obviate the above limitation, perioperative change in Hb between preoperative and the second postoperative day was also done to assess the blood loss indirectly.

Our study noted the mean decline in haemoglobin level loss after 24 hours of delivery was 1.50%±0.74% in 400µg misoprostol group, 1.31±0.63 in 600µg misoprostol group, 0.92±0.41 in 10unit intravenous Oxytocin group, 0.74±0.31 in 15-unit intravenous Oxytocin group, 0.69±0.29 in 800µg misoprostol group and 0.49±0.23 in 20unit intravenous Oxytocin group. By using the paired t test

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we noted that there was significantly reduce the post-operative haemoglobin level loss in several groups in compare to pre-operative ($p<0.05$).**Sood AK & Singh S[17] and Fekih M et al[24]**reported that the significant trend toward lesser perioperative Hb fall in the misoprostol group. In a clinical study by **Samimi et al14Error! Bookmark not defined.** reported that the mean haemoglobin decline was significantly lower in the misoprostol group compared to the group receiving syntometrine ($P = 0.009$). According to their study, misoprostol was more effective and had fewer side effects than intravenous syntometrine in reducing PPH. **Beigi et al[25]** reported that the PPH after a vaginal delivery in patients who received 400 µg of sublingual misoprostol was significantly lower than 10 units of intravenous oxytocin. Comparing haemoglobin changes before and after the delivery revealed that haemorrhage was lower in misoprostol group. **Ahmed AA et al[21]**reported that the haemoglobin level decreased significantly among both groups, manifested by the highly significant p value in comparison of pre and postoperative Hb level in the two groups ($p<0.001$).

This study noted the mean decline in haematocrit level loss after 24 hours of delivery was 2.85%±1.31% in 400µg misoprostol group, 3.45%±1.50% in 10unit intravenous Oxytocin group, 2.40±1.35% in 600µg misoprostol group, 2.15±0.99% in 800µg misoprostol group, 1.35±0.99% in 15-unit intravenous Oxytocin group, and 0.80±0.83% in 20unit intravenous Oxytocin group. By using the paired t test, we noted that there was significantly reduce the post-operative haematocrit level loss in several groups in compare to pre-operative ($p<0.05$).A similar study **Rajaei M et al[26]** reported that there was no significant difference between Hb and HCT or Hb and HCT decrease between the two groups 24 hours after treatment. **Dabbghi Gale et al[27]**examined the differences in PPH reduction between oral misoprostol (400µg) and intravenous oxytocin (10 units). According to their research, the haematocrit mean declined by 3.33% in the oxytocin group and 2.81% in the misoprostol group. Additionally, the oxytocin group required 34.8% more oxytocin, whilst the misoprostol group only needed 20.5%. Similar to our study, they determined that oral misoprostol in 400µg dosages has similar benefits in lowering PPH as 10 units of oxytocin and there were no differences in reducing PPH between the 2 groups.**Shrestha et al[13]** reported that there was no significant difference between the2 groups in hematocrit decline ($P = 0.27$). The severity of hemorrhage after delivery and duration of the third stage of delivery were similar in both groups.**Othman ER et al[22]**reported that the changes in haematocrit level (pre- and postpartum) were comparable between both 400µg misoprostol sublingual and 20unit intravenous Oxytocin groups.

Our study noted the minimum average duration of 3rd stage of labour was 5.06±1.83 min in 20unitintravenous oxytocin group. and the maximum birth weight was 7.12±1.31 min in 400µg in Sublingual Misoprostol group. By using the One-Way ANOVA test, we observed that there was significant deference in dose of Sublingual misoprostol and Intra venous Oxytocin on average duration of 3rd stage of labour ($p<0.05$). **Abd Allah WAE et al[28]**reported that mean duration of 3rdstage of labor was 3.35 minutes in oxytocin and 3.48 minutes in misoprostol group in their study. **Bajwa SK et al[29]**reported mean duration for 3rd stage of labor significantly shorter in group-S (3.62minutes) thangroup-R (4.12 minutes), and group-O (4.94 minutes) ($P = 0.02$).**Mishra S et al[30]** reported that mean duration of 3rd stage of labor was longer significantly in the misoprostol group (5.31±2.1 min) than oxytocin group (3.65±1.75 min) ($p<0.001$).

The present study noted that shivering was 35.0% cases also in 20-unit intravenous oxytocin group were showing shivering followed by 5 patients (25 .0%) in 800µg sublingual misoprostol group and 15.0% cases in 600µg sublingual misoprostol group. The fever, abdominal pain, nausea & vomiting, hypotension and tachycardia were the adverse drug reaction. Fever and shivering were noted in more common in 600µg, 800µg sublingual misoprostol group and also in 20-unit intravenous oxytocin group. Abdominal Pain and Nausea &vomiting was common adverse reaction in higher dose of intravenous oxytocin and as well as sublingual misoprostol groups. Hypotension and tachycardia were in few cases of higher dose of sublingual misoprostol and intra-venous Oxytocin group. **Sood AK & Singh S[17]**reported that the pyrexia, nausea vomiting, shivering, and diarrhoea are common adverse-effects of misoprostol, and are dose-related. **Vimala N et al[15]**revealed that using more sublingual misoprostol and intravenous oxytocin was associated with a higher prevalence of shivering. On the other hand, pyrexia did not differ. Other negative effects on mothers, including nausea or vomiting, did not differ, which is alike to that reported by **Acharya G et al,[7] Hamm J et al[20]**and **Vimala N et al[15]**. Dose of misoprostol in various studies has ranged from 200 to 800 mcg reported by **Acharya G et al,[7] Zhao Y et al,[10]Lokugamage AU et al,[19]Hamm J et al,[20] Vimala N et al[15]**and**Lapaire O et al[11]**. Given that the side effects are dose-related, the current study's 400 mcg dosage was selected to reduce maternal adverse effects while maximising therapeutic benefit. **Hofmeyr GJ et al[31]** reported that the, 400mcg of misoprostol was found safer than 600mcg and just as effective.

LIMITATION

The present study was conducted at single centre and was single-blinded. Furthermore, the sample size in each group was small.

CONCLUSION

Our study concludes that higher dosages of both misoprostol and oxytocin tend to decrease average blood loss; the lack of statistical significance suggests

DOI: 10.69605/ijlbpr_13.8.2024.33

these differences may not be clinically relevant. Varying the dosages of sublingual misoprostol and intravenous oxytocin does not result in statistically significant differences in total blood loss, hemoglobin changes, or hematocrit changes. The effectiveness of sublingual misoprostol is similar to intravenous oxytocin in preventing postpartum hemorrhage (PPH) after cesarean delivery and reduces the need for additional uterotonic agents. These findings suggest that lower doses of misoprostol or oxytocin may be as effective as higher doses, but the severity of adverse effects increases with higher doses.

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