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ORIGINAL ARTICLE

Intravenous Oxytocin Versus Oxytocin Combined with Misoprostol in the Management of the Third Stage of Labor in Vaginal Delivery

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ABSTRACT

Objective: This study was aimed to compare the treatment of the third stage of labour in vaginal delivery between intravenous (IV) oxytocin and IV oxytocin + sublingual misoprostol in primigravida with singleton pregnancy.

Background: Worldwide, over 290,000 women pass away each year either during pregnancy, labour, or the first six weeks following delivery. The most frequent primary cause of maternal mortality in underdeveloped nations is still postpartum haemorrhage (PPH). To prevent atonic postpartum haemorrhage, uterotonic medications are employed. These medications include misoprostol, oxytocin, carbetocin, and methylergometrine. Numerous studies have shown that oxytocin is the best heat-labile agent for halting blood loss.

Study Design: randomized control trial

Place and Duration: This study was conducted at Federal Government Polyclinic Hospital PGMI Islamabad from November 2021 to November 2022.

Methodology: Participants in the study included 40 cases each group of patients. For the study, we used a single blind randomization to allocate the patients in defined groups. Data were entered into SPSS version 23.0. P-value was calculated using the Chi Square test (for categorical dependent variable) and t-test (for numerical dependent variable).

Results: Out of 80 cases in the study**,** 40 were given oxytocin combined with misoprostol combination and 40 received only oxytocin. Greater than 500 mL blood loss occurred more frequently (27.5% versus 17.5%) in the oxytocin group than in the oxytocin combined with misoprostol combination group. However, the statistical significance of this proportional difference was not established (p-value, 0.08). Out of the 80 total cases, this study indicated that 18 (22.5%) women experienced postpartum hemorrhage.

Conclusion: According to the current research, sublingual misoprostol and intravenous oxytocin work better together than they do separately. In comparison to the IV oxytocin alone, the mean blood loss in the combination group was significantly lower.

Keywords: Oxytocin, Misoprostol, PPH (Post partum hemorrhage)

INTRODUCTION

Worldwide, over 290,000 women pass away each year either during pregnancy, labour or the first six weeks following delivery (the postpartum period). Nearly all of these "maternal" deaths take place in low- or middle-income nations, and the majority of them are brought on by a small number of preventable or treatable conditions, including unsafe abortion, postpartum haemorrhage, obstructed labour, and blood pressure issues during pregnancy[1].

Maternal mortality counts as the death where a woman dies while she is pregnant, within 42 days of giving birth, or after finishing her pregnancy. A thorough investigation estimates that there were 275,000 maternal fatalities worldwide in 2015, with haemorrhage accounting for 34% of these deaths [2]. Although PPH is currently not adequately defined, deaths associated with PPH may be avoided with prompt diagnosis and treatment [3].

The most frequent primary cause of maternal mortality in underdeveloped nations is still postpartum haemorrhage (PPH). With active control of the third stage of labour, it can be prevented though. A 500 ml or more blood loss from the vaginal canal within the first 24 hours of giving birth is considered a postpartum haemorrhage [4]. According to the most recent large-scale WHO multi-country survey, the overall PPH death rate was 38 per 100,000 live births, and 1.2% of mothers who gave birth to 275,000 children in middle- and low-income countries reported having PPH. Furthermore, 3% of PPH patients passed away, and 18% experienced serious maternal outcomes. [5].

PPH rates are still high in many nations despite advances in medicine and surgery. Overall0.39 PPH-related deaths per 100,000 maternity admissions occurred in the UK between 2006 and 2008. The major cause of maternal deaths, PPH, accounts for 70% of the 320 maternal deaths per 100,000 live births in Pakistan, according to a 2007 statistical analysis[5, 6]. Uterine atony makes up 80 to 90% of instances of primary postpartum haemorrhage, so it's vital to measure blood loss early to avoid delaying the care of this serious and life-threatening condition[7, 8].To prevent atonic postpartum haemorrhage, uterotonic medications are employed. These medications include misoprostol, oxytocin, carbetocin, and methylergometrine. Oxytocin is the best heat-labile medication for preventing blood loss, according to a number of studies. Since the sublingual route has a longer half-life and prolongs uterine contraction, which controls bleeding, it has been selected as the preferred method for treating PPH. [8–11].

Therefore we conducted this study to compare the active treatment of the third stage of labour in vaginal delivery between intravenous (IV) oxytocin and IV oxytocin + sublingual misoprostol in a primigravida with a singleton pregnancy.

METHODOLOGY

Participants in the study included 40 cases in each group of patients. For the study, we used single-blind randomization to allocate the patients in defined groups. Singleton gestation, term gestational age (37–41 weeks), and spontaneous labour were considered inclusion criteria, whereas assisted vaginal deliveries and patients with any medical conditions were regarded as exclusion criteria.

All patients meeting the inclusion criteria who reported to our department were enrolled. The study participants got a thorough general, systemic, and obstetrical examination as well as all necessary tests after providing a thorough obstetric and menstrual history.

Patients in group A received a standard dosage of IV oxytocin 10 IU along with 400 mg of misoprostol sublingually, while patients in group B received IV oxytocin 10 IU. After randomization, in which each patient had an equal chance of receiving one of the two research therapies, the patients were assigned to each trial group. Throughout the third stage of labour, patients were closely watched. After delivery, blood loss was noticed. An especially

created questionnaire was used to record all study-related data. The comparison of the mean blood loss between the study groups served as the major measurement of the study's primary outcome.

For analysis, data were entered into SPSS version 23.0. Age and blood loss were two quantitative variables for which the means and standard deviations were computed. For qualitative factors, such as side effects like shivering, fever, hyperpyrexia, nausea, vomiting, and diarrhoea, frequencies and percentages were calculated.

We calculated the p-value using the Chi-Square test (for the categorical dependent variable) and t-test (for the numerical dependent variable), a significance level of 0.05 was considered significant.

RESULTS

In this trial, a total of 80 cases were enrolled, 40 were given oxytocin + misoprostol combination and 40 received only oxytocin. Most of the women were between the ages of 25 and 29 years overall. A total of 27 (67.5%) of the patients in the oxytocin + misoprostol group were under the age of 24, and 11 (27.5%) were between the ages of 25 and 29 years. Similarly, 07 (17.5%) of patients were under the age of 24, and 32 (80%) were between the ages of 25 and 29 years in the oxytocin group.

In 23 (57.5%) of the combination group patients, the gestational ages were reported to be up to 40 weeks, as opposed to 26 (65%) of the oxytocin-only cases. In the combination group, there were 17 (42.5%) patients with 41 weeks or older gestation and there were 14 (35%) in the counter group.

Patients in the oxytocin + misoprostol group had an average age of 23.1 + 1.9 years, whereas those in the oxytocin group had an average age of 28.3 + 3.12 years. Similar to this, the mean gestational age in the combination group was 38.7+1.8 weeks and 37.4+.2.0 weeks in the counter group. (As shown in Table I)

When compared to the oxytocin and misoprostol combination group, the frequency of blood loss greater than 500 mL was higher in the oxytocin group (27.5% versus 17.5%). However, the statistical significance of this proportional difference was not established (p-value, 0.08).It was discovered that there was a substantial difference between the two groups' mean blood loss when the two groups' mean blood losses were compared. In the oxytocin + misoprostol group, the mean blood loss was 410.5± 35.6 ml compared to 480.5 ±55.2 ml in the oxytocin group (p-value 0.03). (As shown in TableII)

Table 1: Socio-Demographic Characteristics of study subjects

	Oxytocin combined with Misoprostol (n=40)		Oxytocin only (n=40)	
Frequency Distribution				
Age (years)	N	%	n	%
Up to 24	27	67.5	7	17.5
25 to 29	11	27.5	32	80
30 or above	2	5	1	2.5
Gestational age (weeks)				
Up to 40	23	57.5	26	65
41 or above	17	42.5	14	35
Descriptive Statistics				
Mean Age	23.1+1.9		28.3+3.1	
(Year)				
Gestational age	38.7+1.8		37.4+.2.0	
(Weeks)				

Out of the 80 total cases, the prevalence of PPH was recorded to be 18 (22.5%) overall in this study. Both interventions were deemed safe, with only a few minor side effects reported in the two groups. Compared to 2 cases in the oxytocin and combination groups, there were 3 cases of nausea in the combination group (7.5% versus 5%). There were no significant differences in the occurrence of side effects between the two groups, similar to the vomiting found in 10.0% of cases in the combination group and in 5% of cases in the oxytocin alone group Shivering was also observed in 3 (7.5%) cases, as opposed to 1 (2.5%) in the group that received just oxytocin. With the negligible appearance, there was one complaint of hyperpyrexia and diarrhea in each group.(As shown in Table III)

Table 2: Blood Loss (ml) statistics in groups.

	Oxytocin combined with Misoprostol (n=40)		Oxytocin only (n=40)		p-value
	n	%	n	%	
Blood loss (> 500 ml)					
Yes	7	17.5	11	27.5	0.08
No	33	82.5	29	72.5	
Mean Blood Loss (mL)	410.5 ± 35.6		480.5 ± 55.2		<0.03

Table 3: Comparison of the two groups' side effects.

	Total (n=130)		Oxytocin combined with Misoprostol (n=40)		Oxytocin only (n=40)	
	n	%	n	%	n	%
Nausea	5	3.85	3	7.5	2	5
Vomiting	6	4.62	4	10	2	5
Fever	3	2.31	2	5	1	2.5
Shivering	4	3.08	3	7.5	1	2.5
Hyperpyrexia	2	1.54	1	2.5	1	2.5
Diarrhea	2	1.54	1	2.5	1	2.5

DISCUSSION

Worldwide, over 290,000 women pass away each year either during pregnancy, labour or the first six weeks following delivery (the postpartum period). Nearly all of these "maternal" deaths take place in low- or middle-income nations, and the majority of them are brought on by a small number of preventable or treatable conditions, including unsafe abortion, postpartum haemorrhage, obstructed labour, and blood pressure issues during pregnancy[1]. According to studies, prophylactic oxytocin during the third stage of labour lowers the risk of blood loss greater than 500 mL and helps control postpartum haemorrhage. [12].For the active management of the third stage of labour during vaginal delivery, oxytocin and oxytocin in combination with sublingual misoprostol were compared in this study in a primigravida with a singleton pregnancy.

We compared intravenous oxytocin only versus intravenous oxytocin plus sublingual misoprostol for the treatment of PPH. The two groups' average ages were found to be nearly similar, however, the bulk of the study's cases were between 25 and 29 years. In our study, Patients in the oxytocin + misoprostol group had an average age of 23.1 ± 1.9 years, whereas those in the oxytocin group had an average age of 28.3 ± 3.12 years. Similar to this, the mean gestational age in the combination group was 38.7±1.8 weeks and 37.4±.2.0 weeks in the counter group.

Comparable to our findings, Rajei M. and colleagues' study[13] on the safety and efficacy of misoprostol and oxytocin in the prevention of postpartum haemorrhage showed a virtually same average age.The average age in the misoprostol group was 25.7 years and the average age in the oxytocin group was 24.1 years in another study by Gohil et al. [14]. An explanation for this age distribution could be the cultural norms regarding early marriages in Pakistan, because, women who are recently married and in their reproductive years, or who are primigravida, are typically between the ages of 20 and 30 years in developing countries like Pakistan.

The mean blood loss in the current study was 480.5± 55.2 mL in the oxytocin group and 410.5 ± 35.6 mL in the oxytocin plus misoprostol group. The statistical significance of this difference between the two means was established (p-value = 0.03). In a study identical to this one, following delivery, patients were given

400 mg of sublingual misoprostol or a matched placebo. The dosage of oxytocin given to each individual was 20 IU. The mean intraoperative blood loss in the misoprostol group was considerably lower than it was in the placebo group. They were able to draw the conclusion that misoprostol and oxytocin appeared to minimize blood loss more effectively than oxytocin alone. [15].

The outcomes of our investigation are in agreement with Chaudhuri et al.'s discovery that misoprostol and oxytocin appeared to limit blood loss more effectively than oxytocin alone [15]. Bellad et al. compared the outcomes of sublingual misoprostol to standard care using 10 IU of intramuscular (IM) oxytocin. In the sublingual misoprostol group, the average blood loss was 192 mL, but in the IM oxytocin group, it was 366 mL. No lady has ever lost more blood than 1000 mL [16].

In our study, postpartum haemorrhage (PPH) was found to be prevalent in 18 (22.5%) of the 80 total cases. Misoprostol and regular uterotonics were administered to women in a different experiment by Favole et al. to reduce postpartum blood loss, however, the effect was not statistically significant for blood losses of at least 500 mL or at least 1000 mL. [17].

Findings of the present study revealed that3 (7.5%) cases were reported to have shivering, as opposed to 1 (2.5%) in the group receiving only oxytocin.

Shivering, nausea, and vomiting were a few of the negative effects of the oxytocin and misoprostol combination. In the present study, compared to the IV oxytocin alone group, shivering was somewhat more common in the combination group (7.5% vs 2.5%). A similar pattern of side effects has been discovered in numerous other trials. Misoprostol is commonly reported to cause shivering, chills, and/or fever. The most frequent side effect of misoprostol, which can occasionally be combined with fever, is shivering. Reportedly, 18% of the women who took Misoprostol had to shiver in the extensive WHO multicenter investigation[18].

The current study's results, which show that intravenous oxytocin and sublingual misoprostol as a combination significantly reduce postpartum haemorrhage intensity, support earlier studies on the subject. In Pakistani healthcare settings, misoprostol is a cost-effective solution because that country's economy is still in the development stage. Misoprostol may therefore be helpful in healthcare facilities lacking certain resources, such as refrigerators and skilled delivery personnel.

CONCLUSION

The current study's findings indicate that intravenous oxytocin is advantageous over combination therapy with sublingual misoprostol solely for the prevention of blood loss during the third stage of labour. In comparison to the IV oxytocin alone group, the mean blood loss in the combination group was significantly lower. Other substantial research projects utilizing exacting scientific methodologies must be carried out in other parts of the nation and abroad before the findings of the current study can be generalized.

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