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Original Article

Compare the Mean Blood Loss during a Term Caesarean Delivery in Primigravidas using Sublingual Misoprostol with an Intravenous Oxytocin Infusion

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Abstract

Objective: The objective was to compare the mean1blood loss using sublingual misoprostol and intravenous oxytocin infusion in primigravidas undergoing caesarean section at term.

Methods: This Randomized Controlled Trial was done on 200 pregnant females who were later on randomly divided into two equal groups. The caesarean sections were performed via the transperitoneal approach. Within 2 hours, blood loss was noted. Data was entered & analyzed on SPSS V 21.

Results: The mean1age was 26.29±5.32 years. The mean blood loss was 169.47±35.80ml. The significant difference between the groups with mean blood loss of the1patients i.e. p-value = 0.000.

Conclusion: The use of sublingual misoprostol for management of blood loss is more effective than oxytocin in primigravida undergoing caesarean delivery

Keywords: Postpartum hemorrhage, Blood Loss, Misoprostol, Oxytocin, Caesarean Delivery

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Introduction

Post-partum haemorrhage (PPH) is one of the main cause of maternal deaths after delivery. Its prevalence varies from 5-10% and 100 times more common in under-resourced countries. According to WHO, 20 million morbidities worldwide are result of consequences of PPH and responsible for 1/3rd maternal deaths.[1,2] Uterine atony accounts 70% of primary PPH and many medical and surgical interventions are used to prevent and treat it. The agents that which can be used to prevent the PPH may include "ergot alkaloids, oxytocin, ergonovine, methyl-ergonovine, syntometrine and prostaglandins."[3,4] Operative techniques include "compression sutures, intrauterine packs, external aortic compression selective arterial embolization, non-pneumatic anti-shock garment, using recombinant activated factor VII."[5] Operative deftness has great role in decreasing incidence of primary PPH at caesarean section but uterotonic agents have great role in preventing or reducing bleeding from uterus.[6]

Oxytocin is the uterotonic, that is unstable at higher temperatures, need appropriate storage system, but it is associated with fewer adverse effects including abnormal heart beat, lowering of blood pressure, nausea & vomiting, negative inotropic, antiplatelets, anti-diuretic effects, and it need proper training of obstetricians or technicians who are conducting the labor before administration of oxytocin.[7] While misoprostol is the prostaglandin E1 analogue, it selectively binds with the prostanoid receptors. It can be used as orally, sublingually, or rectally. It has non-invasive administration, longer half-life, and remain stable at room temperature. But, it may lead to shivering or pyrexia after administration.[8,9]

A study from 2020, 5demonstrate that low dose misoprostol given sublingually (400µg) showed equal efficiency as shown by 20IU of oxytocin when given as infusion in decreasing the blood loss after caesarean section. But later on found that the blood loss was significantly higher with oxytocin than misoprostol (673.86 ± 191.13 ml Vs 608.78 ± 127.35 ml) respectively. The

difference was significant (n=50 in each group, p< 0.05).[10]

The rationale of the study is to1compare the1mean blood loss with sublingual1misoprostol versus1intravenous oxytocin infusion in primigravidas undergoing caesarean delivery at term. There are few studies directly comparing misoprostol vs oxytocin infusion. Thus a prospective comparative study of use of misoprostol vs oxytocin for reduction of blood loss is required for determining the efficacy of a cheap, safer and convenient method for prevention of PPH. This trial may prove that sublingual misoprotol is effective as compared to intravenous oxytocin1infusion for reduction of blood loss in first 2.0 hours at caesarean section and may superior to oxytocin and it may lead to its widespread use as it does not require parenteral administration by a skilled birth attendant or cold chain transport. Moreover, it is inexpensive and has a long shelf-life. Further research is needed to confirm these results. This study is therefore designed to be carried out at a large tertiary care center with large sample size as compared to previous studies.

Methods

Study design: Randomized controlled trial study

Study place: Unit IV, Obstetrics & Gynecology Department, Lady Aitchison Hospital, Lahore.

Study period: data was collected in about six months

Sample size: Sample size of 200 cases; 100 cases in each group was calculated with 80% power of test & 5% level of significance, taking magnitude of mean blood loss i.e. 673.86±191.13ml6 with oxytocin infusion and 608.78±127.35ml6 with sublingual misoprostol.

Sampling technique: Non-probability, consecutive sampling was applied to include patients who fulfilled following criteria.

Selection of patients: Primigravida of age 18-35 years presenting >37weeks of gestation (on LMP) undergoing elective caesarean section under spinal anesthesia were included. Multiple pregnancy (on USG), women having placenta previa or placental abruption (on USG), pre-eclampsia BP≥140/90mmHg with proteinuria ≥+1 on dipstick method), eclampsia (BP≥140/90mmHg with convulsions), women receiving anticoagulant treatment (on medical record), fibroid uterus with pregnancy, scarred uterus like myomectomy scar (on USG), abnormal placental implantation or placental abruption (on USG) and patients with coagulation disorder (INR> 2) were excluded.

Data collection: Patients were divided randomly in to two groups. In group AA, patients received misoprostol1400µg sublingually & in group1B, patients were given i.v infusion of120 units of oxytocin in 1000ml saline solution that was started at time of cord clamping at rate of 10ml/min for 30mins followed by 2ml/min. Under spinal anesthesia, the researcher herself performed the caesarean sections (CS) using the transperitoneal method and a curvilinear incision on the lower uterine segment. After surgery, patients were followed up on for two hours after shifting to the post-surgical ward. During 2 hours, blood loss was noted.

Data analysis: Data was analyzed by SPSS version 21. Independent samples t-test was applied to compare the mean blood loss in both trial groups.

Results

Total 200 patients were enrolled. The mean1age of 1 the misoprostol group patients was 26.29±5.32 years & its mean value in oxytocin group patients was 27.73± 4.78 years. The mean of gestational age, BMI, blood loss of1the misoprostol group patients was 40.00±1.45 weeks, 23.49±3.34 kg/m2 & 155.09±29.17 ml. In oxytocin group, the mean value of gestational age, BMI, blood loss was 40.04±1.43 weeks, 24.06±3.18 kg/m^2 and. 183.84±34.92 ml. The BMI mean of the misoprostol group patients was 23.49±3.34 kg/m^2. There was significant difference statistically between blood loss with groups i.e. p - value = 0.000. Table: 1

In ≤ 30 year of age, mean value1of blood loss of the misoprostol group patients was 154.99±31.058 ml and in oxytocin group 185.38±35.213 ml. Similarly, in > 30 patients, the mean1value of blood loss of the misoprostol group patients was 155.34±24.434 ml and in oxytocin group patients was 180.85±34.666 ml. Significant difference was found between the1groups with mean blood loss of the1patients stratified by the age i.e. p-value <0.001. In gestational age 38-40 weeks, the blood loss mean value of the misoprostol group patients was 149.88±28.928 ml and in oxytocin group patients was 185.16±37.622 ml. Similarly, in patients with gestational age 41-42 weeks, the blood loss of mean value is the misoprostol group patients was 162.90±28.102 ml and in oxytocin group patients was 182.09±31.328 ml. Difference was significant between the1groups with mean blood loss of the1patients stratified by gestational age i.e. p-value < 0.05. Table 2

Table 1: *Descriptive of Age, Gestational Age, BMI and Blood Loss*

		Misoprostol	Oxytocin
Age	Mean+ SD	26.29 ± 5.32	27.73 ± 4.78
Gestational Age	Mean+ SD	40.0 ± 1.45	40.04 ± 1.43
BMI (kg/m^2)	Mean+ SD	23.49 ± 3.34	24.06 ± 3.18
Blood Loss (ml)	Mean+ SD	155.09±29.17	183.84±34.92

Table 2: *Comparison of mean blood loss with study groups stratified for effect modifiers*

	Age (years)	Study Groups	Mean	p-value
Blood Loss (ml)	⩽ 30	Misoprostol	154.99 ± 31.05	0.000*
		Oxytocin	185.38 ± 35.21	
	> 30	Misoprostol	155.34 ± 24.43	0.002*
		Oxytocin	180.85 ± 34.66	
Blood Loss (ml)	38-40	Misoprostol	149.88 ± 28.92	0.00
		Oxytocin	185.16 ± 37.62	
	41-42	Misoprostol	162.90 ± 28.10	0.004
		Oxytocin	182.09 ± 31.32	
Blood Loss	Normal	Misoprostol	154.79 ± 28.66	0.00
		Oxytocin	182.68 ± 3569	
	Over-weight	Misoprostol	154.29 ± 29.65	0.000
		Oxytocin	184.70 ± 33.86	

Discussion

Cesarean section is the1common major operation performed on women worldwide. Postpartum hemorrhage is the main cause of preventable maternal mortality in the developing world & its treatment is thought to be a significant and reasonable method, and it has been described as a main component of safe1motherhood.[11] Depending on the delivery method, the average blood loss increases, vaginal birth (500.0 mL of blood), Cesarean section (1000 mL).[12]

Misoprostol has1been used for more than ten years to prevent and treat PPH following vaginal delivery, but there is no consensus on the exact dosage or the most effective method of delivery. Across all routes1of administration, sublingual misoprostol1has the greatest beginning of action, maximum peak level of concentration & the highest absorption.[13] In this1study the mean value of mean blood loss of the misoprostol group patients was 155.09±29.17 ml & its mean value in oxytocin group1patients was 183.84±34.92 ml. Statistically misoprostol group patients significantly showed less mean blood loss as compared to oxytocin group patients i.e. p-value < 0.05. Different studies that support our analysis are discussed in some detail below.

One study in 2017, the mean gestational age was 18.21 ± 3.95 weeks, the mean blood loss was 369.28±87.26 ml. The use of misoprostol is an effective and feasible drug in blood loss.[14] Similarly, in another study by Essam Rashad Othman et al presented that Misoprostol's group reported considerably less overall mean blood loss than the oxytocin group did (490.75mL vs. 601.08 mL; p=0.025). Oxytocin intravenous infusion is less effective than sublingual misoprostol for minimising blood loss during & after caesarean birth.[12] A study from Iran[8] demonstrated that the sublingual use of misoprostol at low dose (400 µg) showed equal efficacy as shown by 20 IU of oxytocin infusion in decreasing blood loss after caesarean section. The blood loss was high significantly in oxytocin 1group than misoprostol (673.86 ± 191.13 ml Vs 608.78 ± 127.35 ml) respectively. The difference was significant (n=50 in each group, p< 0.05).[10]

According to one study, there was no difference in mean blood loss between the oxytocin and misoprostol groups. In the first four hours following surgery, the misoprostol group less blood loss than the oxytocin group.[16] In one trial, the estimated intraoperative blood loss was considerably decreased when intrauterine misoprostol & intravenous oxytocin was combined (418.5 ml vs 647.4 ml, p 0.001).[17] According to Abdelalem et al., sublingual misoprostol is just as effective as oxytocin.[13] According to 2018 study, sublingual misoprostol lowers intraoperative blood loss & the requirement for additional uterotonic drugs after caesarean birth. It might serve as an addition to oxytocin in the treatment of high-risk female who experience postpartum hemorrhage.[18]

A different study by Abdullah, NS showed that 100 pregnant mothers who were carrying singletons to term experienced C.S. while under regional anesthesia. There were 50 female received 400µg sublingual misoprostol and 50 received 20U I.V oxytocin on 500ml lactated ringer solution. Between the two groups, there was a statistically significant difference in mean blood loss, haemoglobin and heamoglobin percent decreases. (P < 0.05).[19]

Conclusion

The conclusion of the study the use of sublingual misoprostol in management of the mean blood loss is more effective than to oxytocin infusion in patients with primigravidas undergoing caesarean delivery at term.

Conflict of Interest: *None*
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