JPSIM Journal of Pakistan Society of Internal Medicine

Original Article

Comparing Vaginal Misoprostol with Intraoperative Oxytocin Infusion in Blood Loss during Abdominal Myomectomy

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Abstract

Objective: To compare a single dose of vaginal misoprostol versus oxytocin infusion in terms of mean blood loss during abdominal myomectomy.

Methods: This Randomized controlled trial was conducted on 100 females from OPD department of Gynecology, District Headquarter Hospital Gujranwala during November 2019 to April 2020. Females were split randomly in two equal groups. In group A, two tablets of misoprostol i.e. 400 micrograms were given via vaginal route 20 minutes before induction of anesthesia. Twenty minutes before induction of anesthesia and during myoma excision, females in group B received 30 units of oxytocin in 1000 ml normal saline at a rate of 120 ml /min. Blood loss was measured. Data was analyzed using IBM. SPSS Version 20. Independent sample t-test was used to compare the two groups for blood loss during surgery. Statistical significance was assumed at a p value of less than <0.05.

Results: The mean age of the patients was 35.69 ± 8.162 years. The age stratification has been shown below. The mean BMI was 24.70 ± 3.040 kg/m2. The largest dimension of the fibroid was 7.57 ± 3.036 cm. The quantitative variables were compared among groups. There was no difference between groups in terms of age, BMI and dimension of the fibroid (p values 0.519, 0.149, 0.922 respectively). However, there was a difference among the groups regarding blood loss during surgery. The blood loss in group A was 452.04 ± 27.461 ml and in group B was 475.62 ± 51.752 ml (p values 0.005). The data was stratified according to age, BMI, type and location of the fibroid. The results showed there was blood loss difference among groups in the following groups only; Age <35 years, > 35 years, BMI <25 kg/m2, intramural location and fibroids dimension <7cm (p value 0.005, 0.021, 0.001, <0.0001, <0.0001).

Conclusion: During abdominal myomectomy, a single dose of vaginal misoprostol is more effective than oxytocin infusion for reducing blood loss.

Keywords: Intraoperative blood loss, Myomectomy, Oxytocin, Uterine fibroids

How to cite this:

Mansoor A, Javed H, Naeem M, Noureen S, Ahmed MW, Hassan S. Comparing vaginal misoprostol with intraoperative oxytocin infusion in blood loss during abdominal myomectomy. J Pak Soc Intern Med. 2025;6(1): 56-59

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Received: 20-04-2024 **Revised:** 05-06-2024 **Accepted:** 22-02-2025

DOI: https://doi.org/10.70302/jpsim.v6i1.2512

Introduction

In the reproductive age more than 15% of the women are found to have uterine fibroid(s) which is one of the most common pelvic tumors. The treatment is not always necessary when it is asymptomatic. Surgical intervention is necessary when it is associated with infertility, recurrent miscarriages, urinary problems and menstrual problems.[1] With the advancement in medical fields many different modalities have been used to tackle this problem like myolysis, uterine artery embolization, minimally invasive surgical procedures etc. but the traditional open surgical procedures are the mainstay of treatment in most of the countries.[2] Open surgical procedure i.e. myomectomy is associated with blood loss and subsequent anemia. To reduce the blood loss during myomectomy various modifications and interventions have been used like intramyometrial vasopressin, oxytocin, chemical dissection, use of epinephrine, various tourniquets etc.[3-5] Misoprostol and oxytocin are used widely to enhance uterine contractions and to decrease blood

loss during various obstetrical and gynecological procedures. Both these drugs have their own pros and cons.[6,7] The effects of a single preoperative dosage of vaginal misoprostol vs intraoperative oxytocin infusion for reducing blood loss during abdominal myomectomy were studied by Mostafa-Gharabaghi, P. et al. (2017). Average bleeding was observed to be 401 + 48 ml in the misoprostol group and 589 + 49 ml in the oxytocin group (p value <0.05).

Currently there is no ideal methodology to render abdominal myomectomy as a bloodless surgery. Every modality has its own pros and cons. Oxytocin is cheap, easily available and is associated with nausea vomiting and distaste in the mouth. On the other hand, misoprostol is relatively expensive, offers a single dose advantage, has storage issues and may cause local irritation and even anaphylactic reactions.[8] In Pakistan the data over this aspect of myomectomy is not available in recent years. A single dosage of vaginal misoprostol vs oxytocin infusion for reducing blood loss after myomectomy is the focus of my research. A shorter hospital stay, fewer transfusions, and less permanent damage to the patient are all potential outcomes of this research on ways to reduce blood loss after myomectomy. Goal of present study is to evaluate the median blood loss during abdominal myomectomy between a single dose of vaginal misoprostol and oxytocin infusion.

Methods

Study design: Randomized controlled trial.

Study place and duration: Department of Obstetrics and Gynecology, District Headquarters Hospital Gujranwala, from November 2019 to April 2020.

Sample Size: Sample size of 100 cases (50 in each group, including 15% dropout rate) was calculated by WHO sample size calculator taking values from a study by Mostafa-Gharabaghi, P., et al.[2] The mean blood loss in vaginal misoprostol was recorded as 401 ± 48 ml and in the group receiving oxytocin as 589 ± 49 ml. The power of test was 80% and confidence interval of 95%.

Sampling Technique: Non-probability consecutive sampling

Selection of females: Patients with uterine fibroid undergoing abdominal myomectomy, aged between 20 to 50 years with a single fibroid <10 cm in its greatest dimension on ultrasound before surgery, were enrolled. While females with chronic medical illnesses like coronary artery disease, hypertension, diabetes, kidney and liver disorders, history of previous abdominal and pelvic surgery, previous history of hormonal therapy for myoma, coagulopathy i.e. INR >1.5 were excluded from the study.

Data collection: The permission from the hospital ethical committee was taken and after fulfilling inclusion and exclusion criteria, 100 patients (50 in each group) were enrolled for study from OPD. All patients provided their signed, written informed permission. The patient's history was meticulously documented, and a thorough physical examination was performed in addition to any necessary laboratory tests. Using a computer-based random number generator, the patients were split evenly between two groups. In group A, two tablets of misoprostol i.e. 400 micrograms were given via vaginal route 20 minutes before induction of anesthesia. Twenty minutes before induction of anesthesia and during myoma excision, patients in group B received 30 units of oxytocin in 1000 ml normal saline at a rate of 120 ml/min. The abdominal myomectomy was carried out under standard spinal anesthesia. Blood loss was measured by the following means; two sources were added to get the final blood loss in ml. There was a buildup of blood in the aspiration apparatus. Difference between dry and wet weight of gauzes used during absorption of blood oozing was considered as 1 gm =1 ml. Same standard preoperative and postoperative care were provided to all patients. All the data was recorded on a specially designed Performa. Data were analyzed using IBM SPSS version 20 registered for windows. Independent sample t test was used to compare the two groups for blood loss during surgery. Statistical significance was assumed at a p value of less than <0.05.

Results

The largest dimension of the fibroid was 7.57 ± 3.036 cm. The quantitative variables were compared among groups. There was no difference between groups in terms of age, BMI and dimension of the fibroid (p values 0.519, 0.149, 0.922 respectively). There was a difference among group regarding blood loss during surgery. The blood loss in group A was 452.04 ± 27.461 ml and in group B was 475.62 ± 51.752 ml (p values 0.005).

The data was stratified according to age, BMI, type and location of the fibroid. The results showed there was a blood loss difference among groups in the following groups only; Age <35 years, > 35 years, BMI <25 kg/m^2, intramural location and fibroids dimension <7cm (p value 0.005, 0.021, 0.001, <0.0001, <0.0001).

Table 1: *Quantitative variables among groups*

Parameter	Group		P value
	A (n = 50)	B (n = 50)	
Age (years)	35.16 ± 7.836	36.22 ± 8.522	0.519[a]
BMI (kg/m^2)	25.14 ± 2.907	24.26 ± 3.135	0.149
Dimension	7.60 ± 2.969	7.54 ± 3.131	0.922
Blood loss	452.04±27.461	475.62±51.752	0.005

Table 2: *Comparison among groups after Age, location, BMI, dimension Stratification*

Variable		Group	n	Mean ± SD	P value
Age (years)	<35	A	24	445.42 ± 23.238	0.005
		B	23	486.70 ± 51.264	
	>35		26	458.15 ± 30.005	0.021
			27	466.19 ± 51.215	
Location of fibroid Location	Intra-mural	A	28	452.14 ± 28.795	0.094
		B	30	474.30 ± 44.912	
	Sub-serosal		22	451.91 ± 26.335	0.000
			20	477.60 ± 61.819	
BMI (kg/m2)	<25	A	26	456.35 ± 24.106	0.001
		B	33	478.39 ± 54.105	
	>25		24	447.38 ± 30.517	0.179
			17	470.24 ± 47.968	
Size of fibroid (cm)	<7	A	25	459.20 ± 26.227	0.000
		B	27	479.41 ± 60897	
	>7		25	444.88 ± 27.295	0.079
			23	471.17 ± 39.298	

Discussion

Uterine fibroids are the most common form of benign tumors in women of all ages. The prevalence is 70% in women before the age of 50 years. The clinical significance of leiomyoma is only in 20-50% of patients. Whether the myomectomy is helpful or not is debatable but consideration should be given to myoma related complications. The choice between hysterectomy and myomectomy should be clearly defined. Women who wish to preserve their fertility and uterus should be given a choice of myomectomy.[1,8] Myomectomy was done via traditional open method. The minimally invasive surgeries like laparoscopic or robotic surgery may be beneficial in short term only. The effect on fertility, recurrence and obstetric outcomes is similar in all kinds of myomectomies.[9,10] Blood loss during fibroid surgery has been a topic of debate since the start of abdominal myomectomy. At present the use of misoprostol has proved beneficial to reduce blood loss while the evidence of other modalities has shown good results on low quality. Methods include ascorbic acid, intramyometrial vasopressin, vaginal dinoprostone, loop ligation, and fibrin sealant patches. Other methods include bupivacaine and epinephrine, tranexamic acid, a matrix of gelatin and thrombin, and a peri-cervical tourniquet.[3,11,12]

The prostaglandins have been used for the cervical ripening for induction of labor. The role of prostaglandins to reduce blood loss during abdominal myomectomy has been studied in many studies. The dinoprostone which is PGE2 has shown to reduce blood loss as compared to placebo in earlier trials.[13] Misoprostol which is a PGE1 analogue, traditionally has been used to reduce postpartum hemorrhage. The use of misoprostol during other procedures has been in hot debate. For the treatment of early pregnancy failure, misoprostol has been very effective as it reduces the chance of bleeding and abdominal cramps. During abdominal myomectomy, rectal misoprostol has been used to reduce blood loss during surgery. The studies favored the use of misoprostol.[8] Oxytocin is also very effective to reduce the incidence of PPH and some studies have shown its efficacy to reduce blood loss during abdominal myomectomy.[5,6]

The benefits and risks of a single preoperative dosage of misoprostol vs oxytocin infusion were examined in a 2017 study by Mostafa-Gharabaghi, P. et al., who performed abdominal myomectomy. Taking misoprostol in a single dosage before surgery seems to be an effective and easy way to lessen bleeding during surgery. As a result, fewer people will need blood transfusions. Patients given misoprostol had much less bleeding than those given oxytocin, with a mean of 401 + 48 ml compared to 589 + 49 ml ($p < 0.05$). There was no difference between groups in terms of age, BMI, dimension and the site of fibroid which is similar to our study.[2,3] This study had a sample size of 35 in each group whereas it was 50 in each group for our study. For the same groups, blood loss recorded was 452.04 ± 27.461 versus 475.62 ± 51.752 ml respectively (p values 0.005).

The use of misoprostol has shown to reduce blood loss during abdominal myomectomies and with addition of other treatments like vasopressin, oxytocin also can be given in combination to reduce blood loss rather than a single modality on its own.[4] The comparable results with other interventions like application of tourniquet have favored the combination of modalities.[14]

Uterine fibroid may complicate pregnancy. During cesarean section delivery the traditional style is to avoid any other uterine surgery to avoid blood loss. But some studies advocated that during cesarean section if patient is stable then single fibroid should be removed. The amount of blood lost during a cesarean myomectomy is similar to that of an abdominal myomectomy.[15] There may be no difference between cesarean and abdominal hysterectomies in terms of major morbidity.[16]

Conclusion

A single dose of vaginal misoprostol is superior to oxytocin infusion for preventing excessive bleeding after abdominal myomectomy. The findings would be confirmed by the outcomes of other multicenter studies.

Ethical Approval: The IRB/EC approved this study via letter no. 13/GMC.

Conflict of Interest: *None*

Funding Source: *None*

Authors' Contribution

AM: Conception
MN, SH: Design of the work
HJ, SN, MWA: Data acquisition, analysis, or interpretation
MN, MWA: Draft the work
AM, HJ, SN, SH: Review critically for important intellectual content
AM, HJ, MN, SN, MWA, SH: Approve the version to be published
AM, HJ, MN, SN, MWA, SH: Agree to be accountable for all aspects of the work

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