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Efficacy of Oxytocin in Reducing Blood Loss During Abdominal Myomectomy

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ABSTRACT

Introduction: The drug of choice for preventing postpartum uterine atony and bleeding is oxytocin. Myomectomy is a procedure that may result in substantial bleeding. In about 20% women, transfusion of blood may be required during abdominal myomectomy. The objective was to compare the frequency of patients who needed blood transfusions with and without oxytocin during abdominal myomectomy.

Place and duration of study: This was a randomized controlled trial carried out at the Department of Obstetrics and Gynecology of Sharif Medical Complex Lahore from 10th May 2018 to 10th November 2018.

Material & Methods: 108 patients having intramural uterine fibroid > 5 cm in size, requiring planned elective open abdominal myomectomy were included and equally divided in both oxytocin and non-oxytocin groups(n=54). 30 IU oxytocin infusion (in 500 ml normal saline) / 120 milliliter per hour were administered during myomectomy, starting after administration of general anesthesia and completing just prior to surgery in patients of oxytocin group. An infusion of pure normal saline was administered at the same amount in the patients of non-oxytocin group. Blood loss was estimated and need for blood transfusion was determined in both the groups. Data was analyzed using SPSS version 24. P-value<0.05 was considered significant.

Results: Patients age ranged from 35 to 45 years with mean age of 40.481± 1.84 years in Oxytocin group while 40.425± 2.68 years in Non-Oxytocin group. Mean blood loss was 290.463±120.91 cc in Oxytocin group and 424.981±106.21 cc in Non-Oxytocin group. Need for blood transfusion was seen in 7.4% patients in Oxytocin group as compared to 25.9% in Non-Oxytocin group (p=0.009).

Conclusion: Our study concludes that to reduce loss of blood during abdominal myomectomy, infusion of intra-operative oxytocin may be efficient and safe. To confirm these results, more studies with varied dosages and protocols are required.

Keywords: Abdominal myomectomy, Oxytocin, Blood transfusions

INTRODUCTION

Henry Dale found in 1906 that discovered that human posterior pituitary gland extracts have the ability of contracting the pregnant cat uterus[1]. In 1953, du Vigneaud sequenced and synthesized the peptide involved, known as oxytocin[2].

Oxytocin plays a role in a wide range of physiological & pathological activities, particularly reproduction such as parturition, breastfeeding, maternal behavior, sexual dysfunction, and orgasm[3].

The drug of choice for preventing postpartum uterine atony and bleeding is oxytocin[4]. The drug must be used with caution, since an intravenous injection of oxytocin in the amount of 10 IU might be harmful to hypovolemic women and women with cardiac problems. While receptors for oxytocin are also present in uterus of non-pregnant women, but their concentration is substantially lower as compared to pregnant women[5]. Because of this, oxytocin's non-pregnancy clinical application is restricted. Myomectomy is a procedure that may result in substantial bleeding[6]. In about 20% women, transfusion of blood may be required during abdominal myomectomy[7]. A study done by Atashkhoei S, et al. reported that in oxytocin group, 7.5% of the women required blood diffusion while in non oxytocin group, 25% of the women required blood transfusion in abdominal myomectomy[8]. Another study carried out by Agostini A, et al. reported no significant difference in perioperative loss of blood in both oxytocin group and the non oxytocin group[9]. A study done by Atashkhoei S, et al reported oxytocin ability in reduction of hemorrhage and need of blood transfusion during myomectomy[8] while another randomised double-blind study reported no significant ability of oxytocin in reducing loss of blood during abdominal myomectomy[9]. Due to this variability in results and no such study yet done in general population of Pakistan, this study was planned to compare the frequency of patients need blood transfusions with and without oxytocin during abdominal myomectomy in our general population. This

research will be useful in determining the role of oxytocin to reduce bleeding and the need for blood transfusions after myomectomy.

MATERIAL AND METHODS

This was randomized controlled trial carried out at the Department of Obstetrics and Gynecology of Sharif Medical Complex Lahore (SMC) from 10th May 2018 to 10th November 2018. Approval for the study was given by Hospital Research and Ethical Committee of SMC pursuant to letter number CPSP/REU/OBG-2015-082-6697. The inclusion criteria for our study was women age 35-45 years, intramural fibroid diagnosed on ultrasound imaging as per operational definition, uterine fibroid > 5 cm in size, planned for elective open abdominal myomectomy of uterine fibroids and ASA score I/II while the exclusion criteria was patients with history of cardiac disease, H/o Diabetes, hemoglobin concentration <10 g/dl on laboratory test, accompanying adenomyosis and endometriosis and patients with preoperative treatment with GnRH analogues. Totally, 108 patients were included. 54 patients were included in both oxytocin and non-oxytocin group. An informed consent in written was taken from all the patients. Baseline demographic information like age, number, and size of fibroids (by ultrasound) of patients was taken. During myomectomy, a 30 IU oxytocin infusion (in 500 ml normal saline) was given at a speed of 120 milliliter per hour after administration of general anesthesia and just before the surgery in patients of oxytocin group. An infusion of pure normal saline was administered at the same amount in the patients of non-oxytocin group. A pfannenstiel incision was used to expose the abdomen in all the surgeries. All the procedures were done by consultant gynecologist of three years post fellowship experience. Blood loss and need for blood transfusion was noted. Data was recorded from both groups by the researcher and documented on pre-designed proforma. All the data was analyzed statistically by using SPSS version 24. For qualitative data mean (SD) were calculated while for quantitative data, frequency (percentages) was calculated. Chi-square test was applied to compare need for blood transfusion in both groups, taken p ≤0.05 as significant.

RESULTS

A total of 108 patients were included in this research work. In our study, patients ages in Oxytocin group, ranged from 35-45 years with mean age of 40.481± 1.84 years and 40.425± 2.68 years in the Non-Oxytocin group. Mean duration of complaints was 7.685±2.09 months in Oxytocin group and 6.925±1.72 months in Non-Oxytocin group. Mean size of fibroids was 8.611±1.69 cm in Oxytocin group and 8.518±1.94 cm in Non-Oxytocin group. Mean number of fibroids was 3.092 ±1.10 in Oxytocin group and 3.111 ± 1.17 in Non-Oxytocin group. Mean weight of patients was 79.388 ± 6.84 kg in Oxytocin group and 73.963±9.24 kg in the Non-Oxytocin group. Mean blood loss was 290.463±120.91 cc in Oxytocin group and 424.981±106.21 cc in Non-Oxytocin group.ASA I grade was dominant in both the groups. (Table-1) In Oxytocin group, need for blood transfusion was observed in 7.4% patients while in non-oxytocin group it was observed in 25.9% patients (p=0.009) (Table-2). Stratification of need for blood transfusion in both the groups with respect to age, duration of complaint, size of fibroids, number of fibroids, ASA grade and weight are shown in Table-3.

Demographic		Oxytocin group	Non-oxytocin group
Age(years) mean±SD		40.481± 1.84	40.425± 2.68
Duration of Complain (months) mean±SD		7.685± 2.09	6.925± 1.72
Size of fibroids(cm) mean±SD		8.611± 1.69	8.518± 1.94
Number of fibroids mean±SD		3.092± 1.10	3.111± 1.17
Weight(Kg) mean±SD		79.388± 6.84	73.963± 9.24
Blood loss (cc)mean±SD		290.463± 120.91	424.981± 106.21
ASA grade n (%)	I	44(81.5%)	39(72.2%)
	II	10(18.5%)	15(27.8%)

Table-1: Demographic features and ASA grade of patients in both the groups.

Need For Blood Transfusion	n=54 Oxytocin group	n=54 Non-oxytocin group	*P-Value*
Yes	4 (7.4%)	14 (25.9%)	0.009
No	50 (92.6%)	40 (74.1%)	
Total	54 (100%)	54 (100%)	

Table-2: Comparison of need for blood transfusion in both groups.

Para-meter	Sub-category	Group	Need for blood transfusion	N (%)	P-value
Age	35-40 years	Oxytocin group	yes	2 (7.4%)	0.155
	35-40 years	Oxytocin group	No	25 (92.6%)	
	35-40 years	Non-Oxytocin group	yes	6 (20.7%)	
	35-40 years	Non-Oxytocin group	No	23 (79.3%)	
	41-45 years	Oxytocin group	yes	2 (7.4%)	0.024
	41-45 years	Oxytocin group	No	25 (92.6%)	
	41-45 years	Non-Oxytocin group	yes	8 (32%)	
	41-45 years	Non-Oxytocin group	No	17 (68%)	
Complaint Duration	≤ 6 months	Oxytocin group	yes	0(0%)	0.022
	≤ 6 months	Oxytocin group	No	16 (100%)	
	≤ 6 months	Non-Oxytocin group	yes	6 (27.3%)	
	≤ 6 months	Non-Oxytocin group	No	16 (72.7%)	
	6 months	Oxytocin group	yes	4 (10.5%)	0.109
	6 months	Oxytocin group	No	34 (89.5%)	
	6 months	Non-Oxytocin group	yes	8 (25%)	
	6 months	Non-Oxytocin group	No	24 (75%)	
Size of fibroids	5-10 cm	Oxytocin group	yes	0(0%)	0.022
	5-10 cm	Oxytocin group	No	16 (100%)	
	5-10 cm	Non-Oxytocin group	yes	6 (27.3%)	
	5-10 cm	Non-Oxytocin group	No	16 (72.7%)	
	>10cm	Oxytocin group	yes	4(10.5%)	0.109
	>10cm	Oxytocin group	No	34(89.5%)	
	>10cm	Non-Oxytocin group	yes	8(25%)	
	>10cm	Non-Oxytocin group	No	24(75%)	
Number of fibroids	1-3 fibroids	Oxytocin group	yes	0(0%)	0.009
	1-3 fibroids	Oxytocin group	No	34(100%)	
	1-3 fibroids	Non-Oxytocin group	yes	6(18.2%)	
	1-3 fibroids	Non-Oxytocin group	No	27(81.8%)	
	3 fibroids	Oxytocin group	yes	4(20%)	0.203
	3 fibroids	Oxytocin group	No	16(80%)	
	3 fibroids	Non-Oxytocin group	yes	8(38.1%)	
	3 fibroids	Non-Oxytocin group	No	13(61.9%)	
Weight	≤ 70 Kg	Oxytocin group	yes	0(0%)	0.091
	≤ 70 Kg	Oxytocin group	No	7(100%)	
	≤ 70 Kg	Non-Oxytocin group	yes	8(30.8%)	
	≤ 70 Kg	Non-Oxytocin group	No	18(69.2%)	
	70 Kg	Oxytocin group	yes	4(8.5%)	0.111
	70 Kg	Oxytocin group	No	43(91.5%)	
	70 Kg	Non-Oxytocin group	yes	6(21.4%)	
	70 Kg	Non-Oxytocin group	No	22(78.6%)	
ASA grade	ASA I	Oxytocin group	yes	3(6.8%)	0.035
	ASA I	Oxytocin group	No	41(93.2%)	
	ASA I	Non-Oxytocin group	yes	9(23.1%)	
	ASA I	Non-Oxytocin group	No	30(76.9%)	
	ASA II	Oxytocin group	yes	1(10%)	0.180
	ASA II	Oxytocin group	No	9(90%)	
	ASA II	Non-Oxytocin group	yes	5(33.3%)	
	ASA II	Non-Oxytocin group	No	10(66.7%)	

Table-3: Stratification of need for blood transfusion in both groups with respect to demographics and ASA grade.

DISCUSSION

In comparison to placebo, oxytocin (30 IU) infusion during abdominal myomectomy led to less intraoperative loss of blood and a lower requirement for blood transfusion, according to this research. Oxytocin increases the production and release of contractile prostaglandins by acting on receptors of oxytocin in the tissues of myometrium and fibroid. As the contractility of the uterus increases, the blood flow to the fibroids and arteries decreases. Because of the reduced volume of blood in uterus and restricted uterine vasculature caused by contraction of uterus and the vasoconstrictive impact of oxytocin, intraoperative loss of blood is reduced. Up to 20% of women having abdominal myomectomy need blood transfusions, according to reports[7,10,12]. In our study, In Oxytocin group, need for blood transfusion was observed in 7.4% patients while in non-oxytocin group it was observed in 25.9% patients (p=0.009). A study done by Atashkhoei S, et al. reported that in oxytocin group, 7.5% of the women required blood diffusion while in non-oxytocin group, 25% of the women required blood transfusion in abdominal myomectomy[8] . In our study, no side effects were observed in using oxytocin. Tachyarrhythmias, hypotension and hyponatremia are all common oxytocin adverse effects[13,14]. The absence of such problems in our research is most likely due to use of very low dose of oxytocin[15,16]. In this research, the oxytocin groups mobilized about 3 hours sooner on average, which might have been a key component in reducing thromboembolic consequences. To reduce the risk of bias and selection a randomized controlled approach was used in this study. Small sample number and lack of follow-up of subjects following

release from the hospital are some of the study's drawbacks. We aimed to standardize the computation and enhance its accuracy by utilizing a single, trained, and blind investigator to calculate intraoperative blood loss, but some error was unavoidable. The quantity of irrigation fluid gathered in the sponges could not be calculated. Even though we documented the number of fibroids removed during surgery, we did not weigh the total amount of fibroid mass removed, which, if it differed across groups, might have brought bias into our results. We did not utilize large dosages of oxytocin since there is not enough data to support their safety. In terms of minimizing blood loss, the advantages of giving oxytocin during myomectomy are limited. To confirm these results, more studies with varied dosages and protocols are required.

CONCLUSION

Our study concludes that to reduce loss of blood during abdominal myomectomy, infusion of intra-operative oxytocin may be efficient and safe. To confirm these results, more studies with varied dosages and protocols are required.

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