doi:10.21276/obgyn.2016.3.1.5 *ISSN Print- 2454-2334; Online- 2454-2342*

RESEARCH ARTICLE

Vasopressin in myomectomy- effectiveness and its sequelae

J Lalnunnem Thiek, Saswati Sanyal Choudhury, Javed Ali

Correspondence: Dr. Saswati Sanyal Choudhury, Associate Professor, Department of Obstetrics and Gynaecology, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam. Email- saswatisc@gmail.com

ABSTRACT

Objective: The objective of this study is to access the amount of blood loss during myomectomy with and without the use of vasopressin. **Methodology**: This prospective study conducted from 1st July 2012 to 30th June 2013. Thirty five patients (Group A) received intramyometrial injection of vasopressin during myomectomy whereas similar number of myomectomy was also performed without using vasopressin (Group B). Assessment of blood loss is done by comparing the amount of intra-operative blood loss, post-operative haemoglobin level, need for blood transfusion in the two groups. **Results**: The mean blood loss in ml in Group A and Group B was 206ml (SD 105.53) and 493.14ml (SD 90.05) respectively ('p' < 0.0001). The post operative mean haemoglobin Group A and B was 10.5gm (SD 1.445) and 9gm (SD 1.585) respectively and comparison was statistically significant ('p' value is 0.0056). Both the groups were comparable in regard to the duration of surgery. Two cases in Group A and eight cases in Group B received blood transfusion. **Conclusion**: Intra-operative blood loss was significantly more in cases where no measure was adopted for controlling blood loss. Use of vasopressin resulted in reduction of blood loss. Significant fall in haemoglobin was observed without the use of vasopressin and fall in haemoglobin was negligible in cases where vasopressin was used.

Keywords: Uterine fibroid, Myomectomy, Vasopressin.

Uterine leiomyomas are smooth muscle tumors and are the most common type of pelvic tumors in women. While medical treatment currently does not allow a permanent cure for fibroids, a number of studies are examining nonsteroidal anti-inflammatory drugs, oral contraceptive pills, progestins, and androgens, as well as gonadotropin-releasing hormone (GnRH) analogs for treatment [1].

The traditional procedure performed is abdominal myomectomy, which is the treatment of choice in reproductive age group as myomas are most prevalent in reproductive years. Myomectomy can also be performed laparoscopically or by hysteroscopic resection in certain conditions.

Since myomectomy was first performed by Washington and John Atlee in 1844, [2] it has come a long way, but even today, the biggest complication of myomectomy remains excessive blood loss during surgery which may require conversion of myomectomy to hysterectomy. Control of bleeding during

Received: 3rd January 2016. **Accepted:** 20th February 2016.

Thiek JL, Choudhury SS, Ali J. Vasopressin in myomectomy- effectiveness and its sequelae. The New Indian Journal of OBGYN. 2016; 3(1): 24-28. *doi:10.21276/obgyn.2016.3.1.5*

myomectomy not only reduces the blood loss but also facilitates to get into the correct plane of dissection and minimized the use of energy sources, prevents tissue necrosis and leads to better healing. One of the earliest methods to reduce blood loss was simply to have an assistant grasp the broad ligaments firmly with each hand to impede blood flow through the uterine vessels. In the 1920s Victor Bonney introduced a specially designed clamp and Rubin, in 1938, was the first to use an elastic rubber tourniquet [3]. An alternative to the use of tourniquets to control bleeding is the local injection of vasoconstrictive agents. Vasopressin, a hormonal tourniquet is the most commonly used agent [3]. Intramyometrial vasopressin injected into the planned uterine incision site for each fibroid reduces blood loss. Dillon in 1962 was the first to use vasopressin and reported that with the use of vasopressin, 72% of patients requiring myomectomy did not need blood replacement compared with control subjects [4]. Frederick and co-workers (1994) noted significantly less blood loss compared with untreated group [5]. Uterotonics like misoprostol and oxytocin have been used during myomectomy (Baldoni,1995). Intravenous tranexamic acid have been in used but control of blood loss is not satisfactory (Caglar, 2008) [6].

Vasopressin significantly reduces blood loss compared to other measures during myomectomy as shown by several studies. It is easily available and cost effective as well. Intramyometrial injection of vasopressin is a simple procedure. Cardiovascular complications are rare. All these factors favored the use of vasopressin as a measure for controlling blood loss during myomectomy in our study. The objective of this study is to assess the efficacy of vasopressin in reducing blood loss during myomectomy.

Materials and method

It is a prospective study conducted in Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, Guwahati from 1st July 2012 to 30th June 2013. The study included 70 patients with uterine fibroid planned for myomectomy. Patients were divided into two groups. 35 patients received intramyometrial injection of vasopressin during myomectomy whereas myomectomy was also performed in 35 patients without using vasopressin.

Exclusion criterias -

1. Patient who refuse to give consent.
2. Women with uterine fibroid proposed for hysterectomy.
3. Women having uterine fibroid with other uterine or pelvic pathology.
4. Women with pulmonary, cardiovascular, vascular and renal diseases.

Patients selected for the study had undergone proper preoperative evaluation with clinical and laboratory investigations. All the patients had given informed consent. Pre-operative haemoglobin assessment is done no greater than 2 weeks prior to surgery. Assessment of blood loss is done by comparing the amount of intra-operative blood loss, post-operative haemoglobin level, need for blood transfusion in the two groups. For the statistical analysis of the study 'Chi-square test' and 't' test were applied.

Results and observations

Baseline characteristics of patients of both group were comparable and are summarised in Table 1. The two groups were almost similar in respect to their past surgical and medical history. The two study groups were comparable with respect to the number of uterine fibroids. There was no significant difference in the pre-

Table 1: Baseline characteristics of patients

Baseline characteristics		**Group A (with vasopressin)**	**Group B (without vasopressin)**
Mean age (in years)		34.60	33.51
Mean Parity		1.67	1.93
No of fibroid	Single	15 (21.4%)	17 (24.2%)
	Multiple	20 (28.5%)	18 (25.7%)
Mean Hb%	Pre operative	11(SD 1.124)	10.9(SD 1.174)
	Post operative	10.4(SD 1.485)	9 (SD 1.585)

operative haemoglobin level in the two study groups. There is no statistical significance in the two groups with a 'p' value of > 0.05. The mean pre-operative Hb and mean post-operative haemoglobin in patients of group A was 11 (SD 1.124) and 10.4 (SD 1.485)

Table 2: Comparision between Group A & B			
Group	**Blood loss (in ml)**	**Duration of surgery (in min)**	**Number of blood transfusion**
A	206 SD(105.53)	70.37 SD(6.673)	2
B	493.14 SD(90.05)	71.65 SD(5.589)	8

respectively with a 'p' value of 0.06.

The mean Hb in pre-operative and post-operative period of group B were found to be 10.9(SD 1.174) and 9(SD 1.585) respectively with a 'p' value of <0.0001 which is considered extremely significant. The post operative mean haemoglobin comparision between Group A and B was statistically significant ('p' value is 0.0056). The mean post-operative haemoglobin in Group A and B was 10.5(SD1.445) and 9(SD 1.585) respectively.

The mean blood loss in ml in Group A was 206 (SD 105.53) and Group B was 493.14 (SD 90.05) with 'p' value being <0.0001 which is considered extremely significant (table 2). The mean duration of surgery in Group A was 70.37 minutes SD (6.673) and Group B was 71.65 minutes SD (5.589), with ' p' value >0.05 (0.6851). Both the groups were comparable in regard to the duration of surgery. Out of 35 patients in each group, 2 cases in Group A and 8 cases in Group B

Table 3: Length of hospital stay		
Hospital days	**Group A**	**Group B**
≤ 7	30 (85.7%)	25 (71.4%)
>7	5 (14.3%)	10 (28.6%)

received blood transfusion. 80% of blood transfusion was noted in group B where as only 20% of total blood transfusion was noted in patients who received intramyometrial vasopressin. There is no significant difference in the incidence of post-operative complications and febrile morbidity between the two groups. The length of hospital stay was comparable in the two study groups.

Discussion

The mean age in this study was 30±3.3 years. Shozo Matsuoka et al. reported mean age of myomectomy at 37.3±4.2 years [7]. Similar results were seen in two studies conducted by Hyo Jin et al. [8] and Yashusi Kotani et al. 2009 [9]. Studies by Parazzini F, Negri E, La Vecchia et al. showed a decreased in the incidence and number of clinically apparent fibroids with increasing parity [10]. Similar result was obtained in a study conducted by Baird DD, Dunson DB et al [11]. However in our study, the number of cases with fibroid was found more in parous women than in nullipara. This could be due to exclusion of patients with fibroids who are not planned for myomectomy. Thus, there is a limitation in this study regarding incidence of fibroids in relation to parity. The incidence of multiple and single fibroid was similar to observations made by Mitsura Shiota et al, 2009 in a study of 149 cases of myomectomy.

In this study,the mean fall in Hb was not significant with the use of vasopressin. Fletcher H et al. in 1996 reported similar observation that there was no significant fall in post-operative Hb with the use of vasopressin [12]. Hiroto Shimanuki et al. in 2005 reported the same [13]. A randomised placebo controlled trial by Frederick J, Fletcher J, Hardie M, Simeon D, Mulling S. in 1994 with the use of vasopressin as a haemostatic showed a lower fall in haemoglobin level and haematocrit compared with the controls. The mean blood loss with the use of vasopressin in the present study is almost similar to observations reported by Frederick J et al. and Assaf et al. Fletcher H et al. and EJ Kongnyuy et al. also reported similar observations. Lin et al in 2008 reported a mean blood loss of 171±146 ml with the use of vasopressin [14]. Rezia Iftikhar, 2009 reported a

significantly lesser blood loss with vasopressin compared to conventional myomectomy without the use of haemostatic [15].

The mean fall in Hb without intervention was significantly more compared to vasopressin group in the present study. Seracchioli et al.2000 [16], Landi et al. 2001 [17] and Lee et al. 2004 [8] made similar observations. It is thus observed that there is more amount of blood loss and a significant fall in Hb level without the use of haemostatic as shown by our study and several other studies. Adoption of measures for controlling blood loss during myomectomy is effective as shown in most studies. In the present study the mean duration of surgery was same in the two study groups. Frederick J et al., 2004 reported same duration of surgery with or without vasopressin.

In the present study the incidence of intra-operative or post-operative blood transfusion was significantly lesser with the use of vasopressin. Ginsberg in 1993 [18] and A. Taylor et al. 2005 reported that the need for blood transfusion during myomectomy is reduced with the use of vasopressin [19]. Cardiovascular complications though rare are serious with the use of vasopressin. Kitamura et al, 2008 reported a sudden fall in blood pressure and bradycardia, ECG showing ST segment depression and premature ventricular contractions [20]. Hobo et al, 2009 also reported bradycardia and cardiac arrest caused by intramyometrial vasopressin [21]. One patient in vasopressin group developed severe bradycardia and sudden rise in blood pressure in the present study.

There was no significant difference in the incidence of post-operative complications & febrile morbidity in the two study group. Similar observation was made by Iver Chelmow & co-workers and Celik et al. 2003 [22]. Conversion to hysterectomy was seen in 2 cases (2.8%) in the present study in no intervention group due to undiagnosed adenomyosis and uncontrolled haemorrhage, whereas no case of conversion was seen in vasopressin group. Majority of cases were discharged from the hospital on or before 7th post-operative day. Iverson in 1996 reported conversion rate of 1.9% and similar conversion rate of 2% was made by Aubuchon et al, 2002. Razia Iftikhar in 2009 reported mean length of hospital stay as 6±1 days similar to the present study.

Conclusion

Vasopressin, a synthetic derivative of anti-diuretic hormone has been tried in several studies for reducing blood loss during myomectomy. Technically, the use of vasopressin is a safe and simple procedure.Vasopressin being cheap and easily available can be used routinely while doing myomectomy whether laparoscopic or abdominal. The effectiveness of vasopressin has been shown beyond doubts by several studies including the present study. However, there is need for more well-designed studies to shed more light on the effectiveness of different interventions to reduce blood loss during myomectomy.

Conflict of interest: None. **Disclaimer:** Nil.

References

1.Lethaby A, Vollenhoven B, Sowter M. Pre-operative GnRH analogue therapy before hysterectomy or myomectomy for uterine fibroids. Cochrane Database Syst Rev. 2001; CD000547.

2.Bozini N, Baracat EC. The History of Myomectomy at the Medical School of University of Sao Paulo Clinics. 2007; 62(3): 209-10.

3.Lesley LB, Rock JA. Leiomyomata uteri and myomectomy. In: Rock JA, Lesley LB. Te Linde operative gynecology. 10th ed. 2008; pg 687-721.

4.Dillon TF, Marbury BE, et al. Vasopressin as a hemostatic in gynecologic surgery; a preliminary report. Obstet Gynecol. 1958; 11: 363.

5.Frederick J, Fletcher H, Simeon D. Intramyometrial vasopressin as a haemostatic agent during myomectomy. Br J Obstet Gynaecol. 1994; 101(5): 435-7.

6.Caglar GS, Tasci Y, Kayikcioglu F, Haberal A. Intravenous tranexamic acid use in myomectomy: a prospective randomized double-blind placebo controlled study. Eur J Obstet Gynecol Reprod Biol. 2008; 137: 227.

7.Matsuoka S, et al. Strategy for Laparoscopic Cervical Myomectomy. The journal of minimally invasive gynaecology. 2010; 17(3): 301-5.

8.Yoon HJ, et al. Laparoscopic Myomectomy for Large Myomas, J Korean Med Sci. 2007; 22: 706-12.

9.Kotani Y, et al. Indications of laparoscopic myomectomy and efficacy of pre-operative GnRHa therapy. Acta Med Kinki Univ. 2009; 34: 27-34.

10.Parazzini F, Negri E, La Vecchia C, Chatenoud L, Ricci E, Guarnerio P. Reproductive factors and risk of uterine fibroids. Epidemiology. 1996; 7(4): 440 - 42.

11.Baird DD, Dunson DB. Why is parity protective for uterine fibroids? Epidemiology. 2003; 14(2): 247-50.

12.Fletcher H, Frederick J, Hardie M. A randomized comparison of vasopressin and tourniquet as hemostatic agents during myomectomy. Obstet Gynecol. 1996; 87(6): 1014-8.

13.Shimanuki H, Takeuchi H, Kitade M, Kikuchi I, Kumakiri J, Kinoshita K. The effect of vasopressin on local and general circulation during laparoscopic surgery. J Minim Invasive Gynecol. 2006; 13: 190-4.

14.Lin XN, Zhang SY, Fang SH, Wang MZ, Lou HY. Assessment of different homeostatic methods used in laparoscopic intramural myomectomy. Zhonghua Yi Xue Za Zhi. 2008; 88: 905-8.

15.Iftikhar R. Outcome of abdominal myomectomy. Journal of Surgery Pakistan (International). 2009; 14 (2): 85-8.

16.Seracchioli R, Rossi S, Govoni F, et al. Fertility and obstetrics outcome after laparoscopic myomectomy of large myoma: a randomized comparison with abdominal myomectomy. Hum Reprod. 2000; 15: 2663-68.

17.Landi S, Zaccoletti R, Ferrari L, Minelli I. Laparoscopic myomectomy: technique, complications and ultrasound scan evaluations. J Am Assoc Gynecol Laparosc. 2001; 8: 495-500.

18.Ginsburg ES, Benson CB, Garfield JM, et al. The effect of operative technique and uterine size on blood loss during myomectomy: a prospective randomized study. Fertil Steril. 1993; 60: 956.

19.Taylor A, Sharma M, Tsirkas P, et al. Reducing blood loss during myomectomyusin triple tourniquets: A randomised controlled trial. Br J Obstet Gynaecol. 2005; 112: 340-45.

20.Kitamura T, Saito Y, Yamada Y. Severe hypotension as a complication of intramyometrial injection of vasopressin: A case report. Masui. 2008; 57: 1517-20.

21.Hobo R, Netsu S, Koyasu Y, Tsutsumi O. Bradycardia and cardiac arrest caused by intramyometrial injection of vasopressin during a laparoscopically assisted myomectomy. Obstet Gynecol. 2009; 113: 484.

22.Celik H, Sapmaz E. Use of a single preoperative dose of misoprostol is efficacious for patients who undergo abdominal myomectomy. Fertil Steril. 2003; 79: 1207.

J Lalnunnem Thiek[1], Saswati Sanyal Choudhury[2], Javed Ali[3]

[1]PGT, Department of Obstetrics and Gynaecology, Gauhati Medical College, Guwahati, Assam; [2]Associate Professor, Department of Obstetrics and Gynaecology, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam; [3]Associate Professor, Department of Obstetrics and Gynaecology, Gauhati Medical college, Guwahati, Assam.