

Role of Cervical Vasopressin in Vaginal Hysterectomy: A Tertiary Care Level Centre Study

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Abstract

Background: The use of vasoconstrictive drugs like vasopressin in major surgeries like hysterectomy can decrease the morbidity of the patient by controlling the intra-operative blood loss.

Materials and Methods: About 80 patients undergoing elective vaginal hysterectomy were selected for the study. They were divided into two groups, in which vasopressin in diluted form was injected pre-operatively in one group, and another group was taken as control. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) for Windows version 19.0 software, Chicago, SPSS Inc.

Result: The parameters like duration of surgery, change in vitals during surgery and post-operative complications showed no significant difference in two groups. However, significant difference ($P < 0.0001$) was seen in the amount of blood loss in two groups.

Conclusion: Vasopressin is a drug which can play a key role in changing the percentage of post-operative morbidity in the patients undergoing vaginal hysterectomy by bringing drastic change in the amount of blood loss in the surgery.

Key words: Hysterectomy, Morbidity, Vasopressin

INTRODUCTION

Hysterectomy is a surgical removal of the uterus with or without the excision of cervix, ovaries, fallopian tube, and other neighboring structures. It is the most frequent performed gynecological surgery. In 2003, over 600,000 hysterectomies were done in the United States alone.¹

It is believed that the short-term mortality (within 40 days of surgery) is common after hysterectomy (0.38 cases per 1000) even when done for benign causes. However, risk increases when the reason for surgery is malignant.² However, the long-term prognosis of treatment is relatively good. About 35% of women after hysterectomy go through another linked surgery within 2 years.³

The success of any surgery in the medical field is dependent mainly on three factors: (a) Amount of bleeding, (b) rate of infection, and (c) intra and post-operative pain. Less amount of blood loss in surgery is essential because of the related morbidity. Besides this, profound bleeding during surgery can hinder the sight of the operative field, resulting in complications. In particular, surgeries like hysterectomy already have high short-term mortality.⁴

During hysterectomy, the chief blood supply of the region is not ligated until after much of the dissection has been done. So, the intra-operative bleeding is the major problem faced during this surgery.⁵ Numerous methods have been used to control blood loss which included hydrodissection with saline and vasoconstrictor injections.⁶

In previous studies, drug which has been used to control the blood loss during surgery are vasopressin and nor-epinephrine. Julian TM *et al.* in 1983, first reported the use of vasoconstrictors in an attempt to lessen the blood loss during hysterectomies.⁷

Vasopressin is a vasoconstrictive drug having a short half-life (20 min) is most preferred drug in gynecological

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surgeries to decrease intra and post-operative bleeding and to improve surgical field visualization. Repeat dose after 45-60 min is safe.⁸

Vasopressin is a synthesized peptide hormones used in the management of diabetes insipidus and gastro intestinal hemorrhage. Three types of vasopressin receptors (V1A, V1B, and V2) are discussed in the literature. All are G protein-coupled receptors. The V1A and V1B receptors increase the intracellular Ca concentration through phosphatidylinositol hydrolysis whereas the V2 receptors operate by increasing the cyclic adenosine monophosphate levels. It causes vasoconstriction through its action on the vasopressin (V1) receptor and acts as antidiuretic drug through its action on V2 receptor in the kidney. The chief mechanism by which vasopressin reduces bleeding is vasoconstriction.⁹

The aim of this study was to analyze the effect of vasopressin in the patients undergoing elective hysterectomy in order to reduce the blood loss during surgery and to decrease the morbidity of the patient.

MATERIALS AND METHODS

In this prospective case-control study conducted at Teerthanker Mahaveer Medical College and Research Centre, Moradabad, India. We examined 80 female patients undergoing elective vaginal hysterectomy. The age of the study population was 30-65 years. Before starting data collection oral consent about the participation in the study was taken from the subjects. Subjects with a history of smoking, hypertension, ischemic heart disease, severe liver disease, peripheral vascular disease, epilepsy, elevated serum creatinine, asthma, and history of recurrent migraines were excluded from the study.

History of the patient (medical and obstetrical) was taken and thorough examination (general and obstetrical) was done. Pre-operative work-up and necessary investigations were done. The patients were taken up for elective surgery after proper pre-anesthetic check-up.

Hysterectomy was planned under sub-arachnoid block. The patients were divided into two groups each consisting of 40 subjects. Dilute 20 unit of vasopressin in 100 ml of normal saline was used for controlling blood loss. In Group A patients (control group), no cervical vasopressin was given. In Group B patients, 30-40 ml solution of vasopressin at the cervicovaginal junction was injected in 2, 4, 8, and 10 'O' clock positions.

Following parameters were observed during surgery:

1. Duration of surgery
2. Blood loss during surgery (mops and gauze pieces

used during surgery were weighed before and after the operation)

3. Blood pressure monitored (pre-operatively and intra-operatively)
4. Post-operative febrile morbidity (oral temperature of >101°F)
5. Post-operative per vaginal discharge
6. Post-operative increase in micturition.

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) for Windows version 19.0 software, Chicago, SPSS Inc. Student's *t*-test were used to analyze quantitative parameters while for qualitative parameters Chi-square test was used. A *P* < 0.05 was considered as statistically significant.

RESULTS

Among 70 patients who underwent hysterectomy, maximum number of patients belonged to 30-65 years of age. The mean age in control and study group was 49.74 years and 48.86 years, respectively. Most of the patients were para 3 in both groups (52.71% in control group and 47.29% in study group).

As regards time required for surgery, 47.50% patients in the control group and 40.00% in study group required the time between 55-60 min and 61-65 min, respectively (Table 1 and Figure 1).

From the Table 1 it is calculated that average time required (min) mean ± standard deviation (SD).

Table 1: Distribution of cases according to time required for the surgery

Duration of surgery (min)	Group A (%)	Group B (%)
45-50	7 (17.5)	9 (22.5)
55-60	19 (47.5)	15 (37.5)
61-65	14 (35)	16 (40.0)

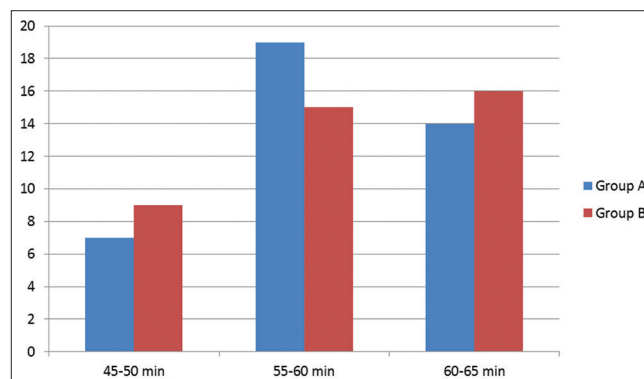


Figure 1: Comparison of duration of surgery in both groups

In control group = 56.79 ± 7.91 .
 In study group = 53.91 ± 7.32 .
 P value = 0.09 (not significant).

Maximum number of patients in control group had blood loss between 200 and 250 ml (30.0%) and study group had blood loss between 101 and 150 ml (45.0%) (Table 2 and Figure 2).

From the Table 2 it is calculated that average blood loss (ml) mean \pm SD.

In control group = 209.51 ± 21.18 .
 In study group = 138.21 ± 19.64 .
 P value = 0.0001 (statistically significant).

After vasopressin infiltration rise in blood pressure was seen. Mean rise was 16.61 mmHg after 5 min of vasopressin in study group as compared to 6.75 mmHg in control group (Table 3).

The difference in the post-operative complications in both control and study group was statistically insignificant (Table 4).

DISCUSSION

Removal of the uterus with or without other organs leads to an inability to bear children and has short- and long-term surgical risks. So, the surgery is usually recommended when other treatment options have failed. However still, is a very

common surgery done at different centers as it is the final treatment of many gynecological problems.

In several gynecological procedures, vasoconstrictors have been used to curtail blood loss such as in myomectomy, hysteroscopy, and abdominal hysterectomy.¹⁰ Still vaginal hysterectomy has been performed without any intracervical injection and use of vasopressin in it remains debatable. However, saline injection intracervically has been used to build a mechanical tamponade and to help in creating an easier plane of dissection.^{9,11-14}

In our study, there was a significant decrease in mean blood loss in Group B patients. It was also observed that ascend in mean BP was significant intra-operatively at 5 min after drug introduction as compared to raise at 10 min and 15 min and control group. Similar study in 1993 has concluded that vasopressin group had significantly less intra-operative bleeding (296 ± 37 ml) than control group (435 ± 55 ml) ($P < 0.02$).⁹ This study supports our findings emphasizing on the fact that use of vasopressin in hysterectomy is useful.

A similar study was done by Holmes *et al.* who found that a decrease in median blood loss from 675 ml in the placebo group to 225 ml in the vasopressin arm ($P < 0.001$) during myomectomy.¹⁵ Still the literature regarding same results of vasopressin in vaginal hysterectomy is lacking.

Other factors like duration of surgery and post-operative complications showed no statistical significance in two study groups.

Thus, this study supports the statement that the use of vasopressin with sensible case selection during vaginal hysterectomy results in significant decrease in blood loss and drop in hemoglobin g% thereby decreasing patient's morbidity and improving prognosis. However, further

Table 2: Distribution of cases according to blood loss during surgery

Amount of blood loss (ml)	Group A (%)	Group B (%)
<100	0 (0)	5 (12.5)
100-150	4 (10.0)	18 (45)
150-200	9 (22.55)	11 (27.5)
200-250	12 (30.0)	6 (15)
250-300	10 (25)	0 (0)
>300	5 (12.5)	0 (0)

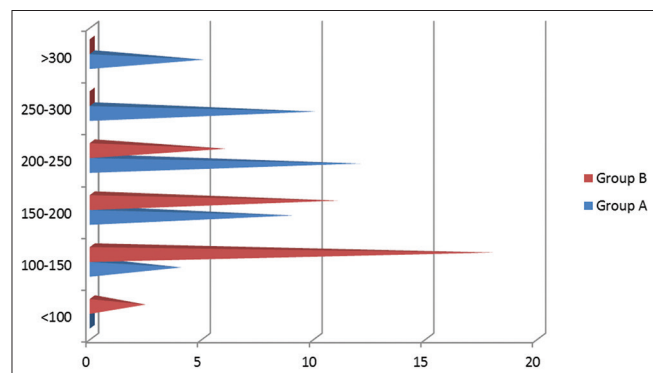


Figure 2: Comparison of blood loss during surgery in two groups

Table 3: Distribution of cases according to pre- and intra-operative blood pressure (mean)

Group	Pre-operative (mmHg)	Intra-operative (mmHg)		
		5 min	10 min	15 min
A	102.56	98.00	96.62	101.37
B	100.49	113.21	111.86	106.53

Table 4: Distribution of cases according to post-operative complications

Complication	Group A	Group B
Fever (>101°F)	2	1
Per vaginal discharge	0	0
Increase micturition	1	0

research work is obligatory to confirm universal role and use of vasopressin in decreasing blood loss during vaginal hysterectomy.

CONCLUSION

No surgical procedure in medical science is more gratifying than one finished successfully with minimal blood loss, with the surgical field as unspoiled at the end as it was at the beginning. Vasopressin has a role in attaining this ideal, but it should be used in dilution and at a low total dosage.

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