



A STUDY OF THE EFFECT OF VASOPRESSIN IN REDUCING BLOOD LOSS IN GYNAECOLOGICAL SURGERIES.

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ABSTRACT

BACKGROUND: The use of vasopressin in major surgeries like hysterectomy and myomectomy can decrease the morbidity of the patient by controlling the intra-operative blood loss. **MATERIAL AND**

METHODS: About 100 patients undergoing elective vaginal hysterectomy and myomectomy were selected for the study. They were divided into two groups, in case group vasopressin in diluted form was infiltrated intraoperatively in the surgical field and in control group no infiltration was done. The two groups were compared in terms of intraoperative blood loss, mean post operative hemoglobin decrease, hospital stay and associated adverse outcome. Statistical analysis was performed using statistical package for social science (SPSS) for windows version 19.0 software Chicago, SPSS. **RESULT CONCLUSION:** Vasopressin is a drug which can play a key role in reducing post-operative morbidity in the patients undergoing major gynaecological operations (vaginal hysterectomy and myomectomy) by decreasing intraoperative blood loss. In the present study estimated intraoperative blood loss in vasopressin group was 145.27 ml which was significantly low in comparison to no injection group in which was 266.45 ml (p value <0.05). This resulted in lesser fall in post-operative hemoglobin level and reduced blood transfusion requirement in vasopressin group. Parameters like duration of surgery, change in vitals during surgery and post-operative complications showed no significant change in vasopressin group (P<0.0001).

KEYWORDS :

INTRODUCTION

Surgery on the uterus causes significant hemorrhage through open veins and blood spurting from transected arteries. Hemorrhage can obscure the operative field and may lead to operative complications while on the other side severe blood loss may require transfusion which has its own complications. Excessive blood loss leads to anemia, which adds to post operative morbidity and hampers fast recovery and wound healing. Most of our patients are already anemic and any further blood loss would simply add fuel to the fire. In case of myomectomy the main risk is bleeding which can be severe and sometimes uncontrollable, resulting in a need for hysterectomy and hysterectomy is not acceptable in nulliparous women who wishes to conceive. Several methods to control blood loss have been used. To reduce blood loss during operation preventive step of injecting dilute solution of vasopressin into the uterus of cervix before they start the procedure has been used since 1950. Arginine vasopressin (AVP) is a uterotonic in the non-pregnant uterus. AVP is a nonapeptide compound of a six member disulphide ring and a tripeptide tail. It is synthesized as a pro-hormone in magnacellular neuron cell bodies of the paraventricular and supraoptic nuclei of the posterior hypothalamus. It has a half life of 10-35 min, being metabolized by vasopressinases found in the liver and kidney. The major mechanism by which vasopressin reduces blood loss is vasoconstriction. Vasopressin also stimulates uterine contraction by acting through myometrial V1a receptor. Vasopressin receptor are present in the myometrium of both pregnant and no-pregnant uterus. A persistent concern, however is that injection of vasopressin is occasionally associated with bradycardia and cardiac arrest, especially if injection is made into a blood vessel inadvertently. Another unresolved issue is identifying the optimum dilution and dose of vasopressin that will reduce blood loss and minimize the risk of cardiac arrest. It is thought that vasopressin induced increase in blood pressure causes vagal-mediated decrease in heart rate. The vasoconstrictive effect of vasopressin may simultaneously cause coronary artery spasm resulting in cardiac ischaemia. By following procedure the potential adverse effects of vasopressin can be minimized –

1. Solution – Dilute the vasopressin in the range of 0.1 to 0.2 U/ml, avoid concentration > 1 unit/ml.
2. Vitals – Alert the anesthesiologist and the surgical team before you inject vasopressin, so that they are vigilant for change in the vital signs.
3. Injection –Double check that you are not injecting into a blood vessel by carefully testing the results of negative aspiration applied to the syringe.
4. Dose – Don't exceed a total doses of approximately 5 units, using a solution of 0.1U/ml, the maximum injection is 50 ml.
5. Repeat Dose – Vasopressin has a relatively short half life in circulation. Repeat injection, 45 to 60 minutes after the first, may be safe.
6. Cardiovascular Pitfalls – Be cautious about using vasopressin in a patient who has established coronary artery or myocardial disease.

AIMS AND OBJECTIVE

To determine the effect of vasopressin in reducing intraoperative blood loss in gynecological surgery

MATERIAL & METHODS

The study was done in department of obstetrics and gynaecology Nalanda Medical College and Hospital Patna Bihar, from June 2019 to June 2020 . A total of 100 patients undergoing two major gynaecological surgeries namely vaginal hysterectomy and myomectomy were recruited after taking informed consent.

INCLUSION CRITERIA-

1. Women undergoing vaginal hysterectomy for any indication with or without concomitant procedure.
2. Women with myoma of any size.

EXCLUSION CRITERIA –

- Patients with medical co morbidities –
1. Cardiovascular disease
 2. Vascular disease
 3. Renal disease

4. Severe liver disease
5. Asthma with steroid use in past period
6. Migraine

Details history was taken with special reference to age, parity, socioeconomic status, education, history of pelvic organ prolapse (duration of prolapse and associated symptoms), bleeding per vaginum (continuous or intermittent, duration of amount of bleeding), menstrual history, obstetrical history, surgical and medical history.

Thorough systemic and gynaecological examination was done at the time of admission.

The following investigations were performed HIV, HBsAG, HCV, CBC -Hb-pre-operative & post-operative(day 3 & day 10), ABORH, Blood Sugar, renal function test, liver function test, serum electrolyte, R/E of urine, C/S of urine, USG of lower abdomen, ECG.

Of 100 patients undergoing surgery 78 were undergoing vaginal hysterectomy indicated for genital prolapse and 22 patients were of myomectomy group. From each of the surgical group half of the patient received intraoperative vasopressin infiltration to the surgical site (39 vaginal hysterectomy and 11 myomectomy) another half did not received any injection (39 vaginal hysterectomy and 11 myomectomy). The selection in each group were random. Those patients assigned to the vasopressin arm received an injection of dilute vasopressin solution(10 units of vasopressin in 50ml of normal saline). During hysterectomy, 20ml of vasopressin solution (4 unit of vasopressin) was injected in 5ml increments at 2,4,8 and 10 o'clock circumferentially around the cervix at the cervicovaginal junction before making an incision. In case of myomectomy vasopressin is diluted with saline as 10 units of vasopressin for every 100ml of normal saline. For a fibroid of about 8cm. size, 20-30ml of the solution was injected in the myometrium causing blanching of myometrium. Estimated blood loss was determined by measuring the blood in graduated collection canisters, weighing lap pads and estimating the amount of blood on the operative field and on surgeon gowns. Data collected included preoperative and surgical variables, such as indication for surgery, parity, menopausal status, history of hormone therapy use, clinical estimation of uterine size, type of anaesthesia given, uterine weight, change in pulse rate and mean blood pressure, duration of surgery. Postoperative data incorporated change in hemoglobin, febrile episodes and length of hospital stay.

STATISTICAL ANALYSIS:

Data were analysed using an independent t-test, fisher exact test, Pearson chi-square appropriate.

RESULT AND DISCUSSION:

Use of vasoconstrictors to minimize blod loss have been shown to be effective in many gynaecological procedures. Specifically, vasopressin has been shown to decrease blood loss in vaginal hysterectomy, abdominal hysterectomy and myoectomy. In present study, the mean decrease in haemoglobin percentage in vasopressin group was 1.14 gm/dl and that in no injection group was 1.55gm/dl which showed a significant difference between the two groups (p value- <0.05) Estimated intraoperative blood loss in vasopressin group was 145.27 ml which was significantly low in comparison to no injection group in which was 266.45 ml (p value <0.05). In a similar randomized study done by Fredrick et al (1994) use of intramyometrial injection of vasopressin during myomectomy, significantly reduced intraoperative blood loss (225ml as compared to 675 ml in placebo group), consecutively lower fall in haemoglobin and reduced need for blood transfusion. ¹ in the present study 8% of patients in no injection group required blood transfusion as compared to 4%

in vasopressin group. Hence use of vasopressin reduced the need for blood transfusion by 50% (Table 2). Currently, there is debate regarding the use of vasoconstrictors such as vasopressin due to its potential cardiovascular adverse effects and uncertain risk verses benefit outcome. Concerned stem from an initial study by England et al 1983, examined the use of epinephrine as a vasoconstrictive agent and showed a relative risk of 5.5 for development of cuff cellulitis in vaginal hysterectomy after using epinephrine. ² Epinephrine produces vasoconstrictive effect on tissue for 5 to 6 hours. But unlike epinephrine vasopressin has much shorter half life and therefore produces its vasoconstrictive action during surgery but the effect is dissipated by the time the surgical field is examined for bleeding pedicles so chances of cuff cellulitis is least. Using intramyometrial vasopressin for reducing blood loss in myomectomy helps to keep the surgical field clear and makes it easier to get the correct surgical plane between the fibroid and myometrium. A prospective randomized control trial by Kammerer – Doak etal, examined the effect of vasopressin compared to normal saline injection during vaginal hysterectomy in terms of both infection risk and blood loss.³No increased risk of infection was demonstrated with the use of vasopressin. Additionally it showed a significant decrease in blood loss intraoperatively. In the present study duration of hospital stay in vasopressin group was shorter as compared to no injection group but the difference was not significant (Table 2). Using intraoperative vasopressin was not associated with adverse outcomes. Mean increase in blood pressure at one minute was 10.64 mm of Hg for vasopressin group but 3.68 mm of Hg for no injection group but this increase in BP was not associated with any adverse event. Vasopressin also did not increase the risk of infection rate.

TABLE 1 Comparison of vasopressin group to no injection group

Variable	Vasopressin group		No injection group		P value
	Mean	SD	Mean	SD	
Intraoperative blood loss (ml)	145.27	137.14	266.45	240.5	< 0.05
Decrease in haemoglobin level (gm/dl)	1.14	0.3265	1.553	0.47	< 0.05

TABLE 2 Comparison of vasopressin group to no injection group

Variables	Vasopressin group	No injection group	P value
Mean length of hospital stay (days)	9.16	9.36	< 0.05
Mean increase in intraoperative BP (mm of Hg)	1 min- 10.64 5 min- 7.48	1 min- 3.68 5 min- 5.84	
Needed blood transfusion	N= 2, 4%	N=4, 8%	
Post operative infection	N= 3, 6%	N=2,4%	

CONCLUSION:

1. Blood loss in patients in whom vasopressin was used, was markedly and significantly reduced.
2. The transfusion requirement was similarly reduced as compared with the control group
3. There was no cardiovascular or other significant complication observed in the patients who received vasopressin.
4. The use of vasopressin does not significantly affect operative time nor does its use cause an increase in post operative infection rate.

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