



**ORIGINAL RESEARCH PAPER**

**Gynaecology**

**A COMPARATIVE STUDY OF NON DESCENT VAGINAL HYSTERECTOMY WITH VASOPRESSIN INJECTION AND WITHOUT VASOPRESSIN INJECTION**

**KEY WORDS:** Non-descent Vaginal Hysterectomy, Intracervical Vasopressin Injection.

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**ABSTRACT**

**AIMS :-** Whether use of Intracervical vasopressin infiltration during Non descent vaginal hysterectomy is better alternative to without medication during Non descent vaginal hysterectomy.  
**METHOD :-**A prospective case control study conducted in the Department of Obstetrics and Gynaecology, Calcutta National Medical College, Kolkata, over women attending Gynae OPD after screening for eligibility and given consent were randomly assigned to receive preoperative intracervical Vasopressin or no intracervical injection. Both the categories were observed carefully throughout postoperative period. The outcome measure under different parameters and tried to establish any correlation between use of intracervical Vasopressin infiltration is at all effective or not.  
**RESULT:-**Total 40 Patients (20 Patients in Vasopressin group and 20 Patients in Non-Vasopressin group) were randomised. Overall Intraoperative blood loss and Intraoperative time duration was less and thereby Hemoglobin decrease was less postoperatively with Intracervical Vasopressin infiltration group. The difference reached statistical significance.  
**CONCLUSION :-**Intracervical Vasopressin infiltration with sensible case selection during Vaginal Hysterectomy results in significant decrease in blood loss and drop in hemoglobin Gm% thereby decreasing patient's morbidity and improving prognosis.

**INTRODUCTION**

Hysterectomy is the most commonly performed gynaecological surgical procedure, next only to caesarean section. The 1st documented case was reported by Bernengario Da Carpi, an Italian who lived in Bolonga in 1507. He performed partial vaginal hysterectomy. Hysterectomy is one of oldest operations performed in the female pelvis. It dates back to the era before anaesthesia and antibiotics. It has under gone many modifications in technique and indication over time. The incidence of hysterectomy varies worldwide. It is relatively higher in developed countries whereas much lower in several developing countries.

Indication of hysterectomy varies from benign conditions like- uterine leiomyoma, dysfunction uterine bleeding, adenomyosis, endometriosis, uterine prolapse, endometrial hyperplasia to malignancy. In our study we have chosen the patients requiring hysterectomy for benign indication only. There is a 20-25% incidence of uterine fibroid tumor in women of fertile age group.

Vaginal hysterectomy was done sporadically through 17<sup>th</sup> & 18<sup>th</sup> centuries. Vaginal hysterectomy was traditionally used only for uterine prolapse and when uterus is of fairly normal size. A narrow pubic arch (<90 degrees), narrow vagina, uterine immobility, nulliparity, prior cesarean section, and a large uterine volume are considered by some authors to be contraindications to vaginal hysterectomy. Newer evidence indicates that the vaginal route is indeed safe for hysterectomy, even for larger uterine volumes and when feasible vaginal method is cost effective. So the traditional contraindications for vaginal hysterectomy need a rethinking.

Successful surgery depends on control of bleeding, infection & pain. Minimizing blood loss during surgery is important

because of the associated morbidity. In addition, intraoperative bleeding can obstruct the view of the operative field and lead to complications. In particular, dissection during vaginal hysterectomy can be hampered by blood loss, because the main blood supply is not ligated until after much of the dissection has begun.

Several methods to control blood loss have been used, including hydro dissection with saline as well as with the injection of vasoconstrictors. In previous reports, procedures that have shown reduced operative blood loss with the use of preoperative vasopressin include loop electrocautery of the cervix, hysteroscopic myomectomy, myomectomy, and abdominal hysterectomy.

One of the first reported uses of a vasoconstrictive agent in an attempt to decrease blood loss in vaginal hysterectomy was in 1983 by England et al.[7]

Vasopressin, a vasoconstrictive drug with a short half-life of 20 minutes is often used in gynaecological surgery to decrease blood loss and improve visualization of the surgical field. Through this study there has been an effort to correlate the use of intracervical vasopressin with decreased blood loss during vaginal hysterectomy. The aims and objectives has been to compare blood loss, operative time, rise in mean blood pressure, Change in haemoglobin level & complication rates in patients undergoing vaginal hysterectomy.

**Various methods have been used to promote haemostasis during vaginal hysterectomy:-**

1. Normal saline.
2. Nor –epinephrine.
3. Vasopressin.

**Vasopressin:**

Vasopressin agents have played a role in gynaecologic surgery dating back to the late 1960's. Vasopressin (AVP) was one of the first synthesized peptide hormones, used to treat diabetes insipidus (DI) and gastro intestinal haemorrhage. discovered by Oliver and Schafer in 1895 by demonstrating the vasopressor effects of posterior pituitary extracts, while Farini and Velden described its antidiuretic effects by successfully treating DI with neuro-hypophyseal extracts, providing the name antidiuretic hormone.

Later it was proved that the same hormone possessed both antidiuretic and vasopressor activity. Currently, vasopressin and terlipressin (AVP/TP) have emerged as promising agents for the management of refractory shock in critically ill children. However, their effects on various vascular beds and tissues are complex and sometimes apparently paradoxical.

Vasopressin has a short plasma half-life of 10-20 min and pressor effect lasts for 30 to 60 minutes. Repeat injection 45 to 60 minutes after the first may be safe.

**Vasopressin receptors:**

There are at least 3 kinds of vasopressin receptors: V1A, V1B and V2. All are G protein coupled. The V1A and V1B receptors act through phosphatidyl inositol hydrolysis to increase the intracellular Ca<sup>2+</sup> concentration. The V2 receptors act as though to increase the cAMP levels.

**Mechanism of action:**

Vasopressin regulates plasma volume, blood pressure and osmolality. Under normal conditions, its main role is in regulation of water balance with minimal effect on BP. It causes vasoconstriction by acting through the vasopressin (V1) receptor and exerts its antidiuretic action through the V2 receptor in the kidney. The major mechanism by which vasopressin reduces blood loss is vasoconstriction.

Vasopressin also stimulates uterine contraction by acting through myometrial V1a receptors. Unlike oxytocin receptors, which are plentiful in term uterus but far less abundant in the non-pregnant uterus, vasopressin receptors are present in the myometrium of both pregnant and non-pregnant women. Thus it is an uterotonic in the non-pregnant uterus.

**METHOD**

The study was conducted in the Department of Obstetrics & Gynaecology of Calcutta National Medical College & Hospital, Kolkata during the period of March 2018 to August 2019. The study population were the women who underwent non descent vaginal hysterectomy for benign indications admitted through outpatient department or emergency. The study included 40 patients, of which

Group A - 20 patients underwent non descent vaginal hysterectomy with intracervical vasopressin infiltration (Study group)

Group B - 20 patients underwent non descent vaginal hysterectomy without vasopressin infiltration. (Control group)

Sampling done based on the following Inclusion and Exclusion criteria:

**Inclusion Criteria:**

- Informed consent
- Vaginal hysterectomy of benign pathology.

**Exclusion Criteria:**

1. Patients not giving consent.
2. Patient with significant medical illness like
  - Hypertension
  - Peripheral vascular disease

- Epilepsy
- Ischemic heart disease
- Impaired renal function
- Asthma
- Severe liver disease
- History of recurrent migraines

After through history taking followed by physical examination was done to reach to a clinical diagnosis. Laboratory testing done for pre anaesthetic evaluation and fitness for surgery. Ultrasound of pelvis was done in all cases. All patients were given prophylactic antibiotic injection Ceftriaxone (1 gm) intravenously. **Preparation of vasopressin solution** – 20 unit of vasopressin in 200 ml of normal saline was used. Spinal Anaesthesia was given and time taken for surgery is calculated by time from incision till the end of the procedure. All the mops and gauze pieces used during vaginal hysterectomy were weighed before and after the procedure for calculation of Intraoperative Blood Loss.

**Instillation of vasopressin:**

A total of 30-40 ml solution of vasopressin was injected at 2, 4, 8 and 10 o'clock circumferentially around the cervix at cervico-vaginal junction. All the patients undergoing vaginal hysterectomy were included even if other concurrent procedures were scheduled, as long as hysterectomy was the first procedure. Vaginal hysterectomy was performed and important steps were timed, including time until entering the posterior cul-de-sac, removal of the uterus, and reattachment of the cardinal ligaments to the vaginal cuff. Only data from hysterectomy portion of the surgery were included in the analysis. Intraoperative parameters (time taken for surgery, amount of blood loss, vitals, any complications) was noted. Number of the patients requiring postoperative blood transfusion was noted. Post operative parameters ( febrile morbidity, UTI, vaginal discharge or other complication) noted. Postoperative pain score noted using VAS on 3<sup>rd</sup> postoperative day. Haemoglobin level on 5<sup>th</sup> postoperative day. Follow up of the patients at 4 to 6 weeks was done at the outpatient department.

**Statistical Analysis:**

Categorical variables are expressed as Number of patients and percentage of patients and compared across the groups using Pearson's Chi Square test for Independence of Attributes/ Fisher's Exact Test as appropriate. Continuous variables are expressed as Mean, Median and Standard Deviation and compared across the groups using Mann-Whitney U test. The statistical software SPSS version 20 has been used for the analysis. An alpha level of 5% has been taken, i.e. if any p value is less than 0.05 it has been considered as significant.

**RESULTS**

We have conducted a prospective case control study in the Department of Obstetrics & Gynaecology of Calcutta National Medical College & Hospital, Kolkata over a sample size of 40 patients who underwent non descent vaginal hysterectomy for benign indications admitted through outpatient department or emergency. In the present study maximum number of patients belonged to 41-50 years of age, 60% in control group and 60% in study group. The mean age in both the control group and study group was 46.95 years and 44.95 years respectively. In this study maximum number of patients in both groups was 2<sup>nd</sup> parity and second most common was 3<sup>rd</sup> parity in both groups. p value is 0.321 which is statistically not significant.

The number of patients with H/O previous CS was 9 in study group whereas in control group no patients were found with H/O previous CS. Regarding the associated co morbidity in the control group 3 (15%) were diabetic, none was hypothyroid; whereas the incidence in the study group 1 (5%) was diabetic, 3 (15%) was hypothyroid. p value is 0.221 which is not significant.

In this study, maximum number of patient having 8 weeks uterine size in both groups and second most common was 10 weeks uterine size in both groups. p value is 0.940 which is not significant. In this study, indication to surgery in majority of the cases was AUB, accounting for 10 cases (50%) in the control group and 11 cases (55%) in the study group. The second most common indication of surgery was uterine fibroid, accounting for 3 cases (15%) in the control group and 6 cases (30%) in study group. The other indications were Adenomyosis- 6 cases (30%) in control group and 1 case (5%) in the study group; DUB- 1 case (5%) in control group and 2 cases (10%) in study group. p value is 0.191 which is not significant.

We observed that mean operative time was 64.25 minutes in control group whereas mean operative time was 50.75 minutes in study group. After comparison the p value was <0.001 which is statistically significant. So that NDVH with vasopressin injection has less duration of surgery than NDVH without vasopressin injection.

In this study, mean intra operative blood loss was 116.25 ml in control group while study group had a mean intraoperative blood loss of 74.25 ml. Mean intraoperative blood loss is less in the NDVH with Vasopressin infiltration than NDVH without Vasopressin infiltration. p value is <0.001 which is statistically significant.

Rise in Blood pressure was observed after vasopressin infiltration. Mean rise was 3.60 mm of Hg after 5 minutes of vasopressin infiltration in study group as compared to 1.05 mm of Hg in control group, which is not statistically significant.

In this study, mean changes in haemoglobin was 0.99 gm/dl in control group while study group had a mean changes in haemoglobin of 0.50 gm/dl. p value is <0.001 which is significant.

In my study the postoperative pain analysis by pain visual analogue scoring system was done on 3<sup>rd</sup> day of operation and it was found that mean post operative pain score 2.85 in control group while in study group mean post operative pain score was 2.75. p value is 0.435 which is not significant. In this study febrile morbidity was taken as oral temperature of 101 degree on any 2 days of the first 10 post operative days excluding the first 24 hours and there is no significant difference in both control and study group. p value is 0.605 which is not significant.

**Table 1: Age**

	NDVH		Total	p Value	Significance
	No Medication	Vasopressin Injection			
Age in years	31-40	3(15)	4(20)	7(17.5)	0.767 Not Significant
	41-50	12(60)	12(60)	24(60)	
	51-60	4(20)	4(20)	8(20)	
	61-70	1(5)	0(0)	1(2.5)	
Total	20(100)	20(100)	40(100)		

(All numbers in table within brackets are mentioning percentages)

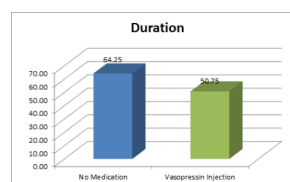
Age in years	NDVH						p Value	Significance
	No Medication			Vasopressin Injection				
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		
	46.95	46.50	5.81	44.95	44.00	5.13	0.284	Not Significant

**Table 2: History of previous CS**

	H/O of previous CS	NDVH		Total	p Value	Significance
		No Medication	Vasopressin Injection			
	NIL	20(100)	11(55)	31(77.5)	0.001	Significant
	ONE	0(0)	9(45)	9(22.5)		
Total		20(100)	20(100)	40(100)		

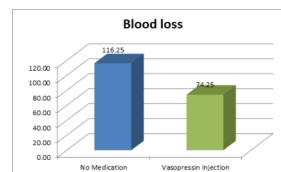
**Table 3: Duration of Surgery (minutes)**

	NDVH						P VALUE	Significance
	No Medication			Vasopressin Injection				
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		
Duration (minutes)	64.25	65.00	8.32	50.75	50.00	6.74	<0.001	Significant



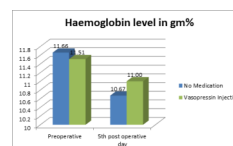
**4: Intra-operative Blood Loss(ml)**

	NDVH						P VALUE	Significance
	No Medication			Vasopressin Injection				
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		
Blood loss (ml)	116.25	115.00	12.66	74.25	75.00	12.17	<0.001	Significant



**Table 5: Changes in Haemoglobin level preoperative to 5th postoperative day:**

	NDVH						P VALUE	Significance
	No Medication			Vasopressin Injection				
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		
Change in Hb Preoperative to 5th postoperative day (gm/dl)	0.99	0.95	0.17	0.51	0.50	0.11	<0.001	Significant



## DISCUSSION

Vaginal extirpation of uterus for non-malignant indication is recognized by many gynaecologists as a preferential method for the management of benign pelvic disease. As stated by Pratt (1976), "If a uterus is to be removed it is best removed vaginally." Vasoconstrictors to minimize blood loss have been shown to be effective in many gynaecological procedures. Historically vaginal hysterectomy has been performed without any intracervical injection or with a saline injection intracervically to create a mechanical tamponade and potentially to assist in creating an easier plane of dissection. Specifically vasopressin has been shown to decrease blood loss in myomectomy, hysteroscopy and abdominal hysterectomy. In present study operation performed was non descent vaginal hysterectomy in both groups.

The mean age of control and study group was 46.95 years and 44.95 years respectively. In this study majority of patients belongs to age group 41-50 years in both the groups since incidence of menstrual disorders is more during this age group.

In the present study maximum number of patients belongs to 2<sup>nd</sup> parity in both group and second most common was 3<sup>rd</sup> parity in both groups. The tissue resilience, free space in the parametrial tissue made the vagina roomy for the surgical procedure of NDVH.

In the present study 9 cases had H/O previous CS in study group whereas no patients in control group. As we know chance of blood loss is more in case of previous CS and also difficult to create plane of dissection. Vasopressin is very helpful to minimize blood loss and potentially to assist in creating an easier plane of dissection. All the patients in both groups with associated co morbid conditions were well managed before surgery and during the perioperative period in the hospital by multidisciplinary approach.

In this study, indication to surgery in majority of the cases was AUB followed by Uterine fibroid and Adenomyosis. So the study and control groups were comparable regarding the indication of surgery.

We observed that mean operative time was 64.25 minutes in control group whereas mean operative time was 50.75 minutes in study group. After comparison the p value was <0.001 which is statistically significant. So that NDVH with vasopressin injection has less duration of surgery than NDVH without vasopressin injection, which was similar to the study of H.G.SCHROEDER et al [8]

In this study, NDVH with vasopressin infiltration shows considerable advantages over NDVH without vasopressin infiltration with respect to blood loss. Mean blood loss in study Group is 74.25 ml & Control Groups is 116.25 ml. The blood loss between the two groups compared & the p value obtained <.001 which is statistically significant.

This study is similar to the study of Julian et al (1993), they concluded that vasopressin group had significantly less intraoperative blood loss (296±37ml) versus (435±55 ml) in control group (p<0.02). [4]

Frederick et al (1996) showed a decrease in median blood loss from 675 ml in the placebo group to 225 ml in the vasopressin group (p<0.001) during myomectomy. Urmila Tripathi (2015) shows significant decrease in mean blood loss of about 109.43 ml in both groups.[5]

In our study, rise in Blood pressure was observed after vasopressin infiltration. Mean rise was 3.60 mm of Hg after 5 minutes of vasopressin infiltration in study group as compared to 1.05 mm of Hg in control group.

Urmila tripathi, on their study (2015) noticed that rise in mean blood pressure was significant intra operatively at 5 minutes after vasopressin injection as compared to rise at 10 minutes & 15 minutes and control group.

In our study, mean changes in haemoglobin was 0.99 gm/dl in control group while study group had a mean changes in haemoglobin of 0.50 gm/dl. The haemoglobin level change from preoperative to 5<sup>th</sup> post operative day between the two groups compared & the p value obtained <0.001 which is statistically significant. Urmila tripathi, on their study (2015) noticed that maximum number of patients in study group had change in haemoglobin from 0.21 to 0.4 gm% while in control group maximum number of patients belongs to change in haemoglobin from 0.41 to 0.6 gm%. [5]

In our study the postoperative pain analysis by pain visual analogue scoring system was done on 3<sup>rd</sup> day of operation and it was found that mean post operative pain score 2.85 in control group while in study group mean post operative pain score was 2.75. p value was 0.435, therefore regarding post operative pain is insignificant in comparison with both groups.

Regarding febrile morbidity as post operative complication in our study noticed that, no significant difference between study and control group. That mean use of vasopressin does not increase febrile morbidity.

Limitations of our study is that fixed time limit prevented us from increasing the sample size. Secondly long term follow up was beyond our scope because of the unwillingness to attend GOPD after removal of uterus.

## CONCLUSION

In this study we can conclude that:-

Intraoperative blood loss is significantly less in NDVH with intracervical vasopressin infiltration.

Intra operative time duration is less in NDVH with intracervical vasopressin infiltration.

As intraoperative blood loss is less in NDVH with intracervical vasopressin infiltration, there is haemoglobin decrease is less post operatively and chance of blood transfusion is also minimized.

No surgical procedure in medical science is more gratifying than one finished successfully with minimum blood loss, with the surgical field as unspoiled at the end as it was at the beginning, with one sponge with a spot of blood and with the patient safely in the recovery room. Vasopressin has a role in reaching for this ideal.

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 haemoglobin gm% thereby decreasing patient's morbidity and improving prognosis. However, further research work is obligatory to confirm universal role and use of vasopressin in decreasing blood loss during non descent vaginal hysterectomy.

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