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Original Research Article

A randomized interventional study on clinico-surgical outcome of vaginal hysterectomy with hydro dissection versus without hydro dissection

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ABSTRACT

Background: Hysterectomy is one of the most common gynaecological surgeries performed worldwide. The common indications for hysterectomy are benign like symptomatic uterine leiomyomas, endometriosis etc. We compare clinico-surgical outcome of vaginal hysterectomy with hydro dissection versus without hydro dissection.
Methods: Women attending Gynae OPD or admitted was included in study and 30 cases taken in each group. Group A: Vaginal hysterectomy with hydro dissection. Hydro Dissection was done by about 50 ml to 100 ml of saline was infiltrated under pressure all around the cervix, just under vaginal mucosa below the bladder sulcus. Group B: Vaginal hysterectomy without hydro dissection.
Results: The mean age of cases in Group-A was 49.63±8.91 yrs and in Group-B was 48.03±5.39 yrs was uniform. The mean operative time in Group-A was 49.07±6.46 min and in Group-B was 53.40±5.87 min which was statistically significant (p-value = 0.009). The mean intraoperative blood loss in Group-A was 89.77±6.49 ml and in Group-B was 97.67±12.93 ml which was statistically significant (p-value = 0.005). The mean level of change in Hb was 0.70±0.29 gm/dl in Group-A and was 1.01 ± 0.43 gm/dl in Group-B, which was statistically significant (p-value = 0.002).
Conclusions: Hydro dissection with saline in vaginal hysterectomy is associated with significant reduction in duration of surgery, blood loss and lower mean level of change in Hb.

Keywords: Hydro dissection, Surgery, Vaginal hysterectomy

INTRODUCTION

Hysterectomy is one of the most common gynaecological surgeries performed worldwide.[1] Hysterectomy for benign reasons is usually considered only after all other treatment approaches have been tried without success.[2] The M.C indications for hysterectomy are symptomatic uterine leiomyomas, abnormal uterine bleeding, endometriosis, and prolapse. Hysterectomies are performed through–vaginal, laparoscopic and abdominal route[3]. Vaginal and laparoscopic procedures are considered "minimally invasive" surgical approaches because they do not require a large abdominal incision, and thus are associated with lower morbidity, less postoperative pain, more rapid return to normal activities and shorter hospital stay compared with abdominal hysterectomy.[4]

Selection of the route of hysterectomy for benign causes can be influenced by many factors such as uterine size, mobility, accessibility, pathology confined to uterus, adnexal pathology, severe endometriosis or adhesions, safety, cost effectiveness and medical need of patient.[5] Vaginal hysterectomy is preferred whenever feasible. Laparoscopic hysterectomy is a preferable alternative for those patients in whom a VH is not indicated or feasible. Abdominal hysterectomy may be required when the

vaginal or laparoscopic approach is not appropriate to manage the patient's clinical situation.[1]

Several methods have been used to control surgical blood loss including hydro dissection with saline, use of electrocautery, tourniquets or clamps and local infiltration with several vasoconstrictor agents.[6]

Hydro dissection with saline decreases intraoperative blood loss in vaginal surgery without complicating the intraoperative and postoperative outcome. In this technique about 50 to 100 ml of saline is infiltrated beneath vaginal mucosa all around cervix below the bladder sulcus, injected circumferentially, till blanching occurs approximately 0.5 cm deep to mucosa.[4]

This technique works by two principles: firstly– it serves as a vascular tourniquet so that all oozing small blood vessels are compressed and the blood loss is automatically prevented. Secondly, tissue planes are filled with fluid which gives proper plane of dissection which becomes very clean, fast, bloodless, easy and artistic surgery.[7] The advantage of this technique is that saline is easily available and does not cause any cardiovascular compromise.[8]

It has been suggested that hydro dissection technique makes the art of vaginal hysterectomy simpler, faster and bloodless.[4]

METHODS

This was randomized controlled interventional study conducted from May 2021 to May 2022 and 2 months for data compilation & analysis. Case selected according to inclusion and exclusion criteria amongst the women admitted in the Department of Obstetrics and Gynaecology, SMS Medical College and Hospital, Jaipur.

Inclusion criteria

Inclusion criteria were uterine size less than 12 weeks of uterus, adequate uterine mobility, abnormal uterine bleeding, prolapsed uterus was included.

Exclusion criteria

Exclusion criteria were patients with complex adnexal mass, patients with previous two or more LSCS, any gynaecological cancer.

Sample size

The sample size is calculated at 80% study power and α - error of 0.05 assuming a standard deviation of 0.55 mops mean blood loss in both the groups as found in the seed article[4]. For minimum detectable difference of 0.64 mops mean blood loss between both the group, minimum 22 cases of vaginal hysterectomy will be required as sample size, which is further enhanced and rounded off to 30 cases in each group accounting attrition

Methodology

Informed consent of the women was taken prior to study. After taking a thorough history and clinical examination including POPQ staging, patients were subjected to routine investigations like CBC, RBS, RFT, LFT, urine analysis, blood grouping and Rh typing, viral markers, chest X-ray, ECG, USG abdomen and pelvis, Pap smear and D&C, if required. Randomization was done to allocate women in each group. Group A-vaginal hysterectomy with hydro dissection. Method of hydro dissection in vaginal hysterectomy: about 50 ml to 100 ml of saline was infiltrated under pressure all around the cervix, just under vaginal mucosa below the bladder sulcus. Group B-vaginal hysterectomy without hydro dissection.

RESULTS

The age group of women in the present study varied from 36-71 yrs (Table 1).

Table 1: Distribution of cases according to age.

Age (years)	Group-A		Group-B	
	Number of cases	%	Number of cases	%
≤40	7	23.33	4	13.33
41-50	12	40.00	18	60.00
>50	11	36.67	8	26.67
Total	30	100	30	100.00
Mean±SD	49.63±8.91		48.03±5.39	
P value	0.404 (NS)			

According to parity, cases were uniformly distributed in both groups (Table 2).

Table 2: Distribution of cases according to parity.

Parity	Group-A		Group-B	
	Number of cases	%	Number of cases	%
P1-P3	15	50.00	13	43.33
≥P4	15	50.00	17	56.67
Total	30	100.00	30	100.00
P value	0.757 (NS)			

Table 3: Distribution of cases according to stages of UV prolapse.

Stage of UV prolapse	Group-A		Group-B	
	Number cases	%	Number of cases	%
Stage I	3	10.00	3	10.00
Stage II	10	33.33	8	26.67
Stage III	9	30.00	13	43.33
Stage IV	8	26.67	6	20.00
Total	30	100.00	30	100.00
P value	0.745 (NS)			

According to stages of UV prolapse cases were uniformly distributed in both groups (p-value= 0.745, statistically insignificant) (Table 3).

Most common associated co-morbidity in Group-A i.e., 3 (10.00%) and Group-B i.e., 4 (13.33%) was hypertension (Table 4).

Table 4: Distribution of cases according to associated co-morbidities.

Associated co-morbidity	Group-A		Group-B	
	Number of cases	%	Number of cases	%
Hypertension	3	10.00	4	13.33
Asthma	0	0.00	1	3.33
Obesity	0	0.00	1	3.33
Anaemia	0	0.00	1	3.33
DM	2	6.67	2	6.67
Hypothyroidism	0	0.00	1	3.33
Heart disease	0	0.00	1	3.33
Migraine	1	3.33	0	0.00
PCKD	1	3.33	0	0.00
Smoking	1	3.33	0	0.00
Epilepsy	1	3.33	0	0.00
Hypertension + Hypothyroidism	1	3.33	0	0.00
None	20	66.67	19	63.33
Total	30	100	30	100
P value	0.601 (NS)			

In Group-A 9 (30.00%) cases and Group-B 12 (40.00%) cases had tubal ligation as previous surgical procedure (Table 5).

Table 5: Distribution of cases according to prior abdominal surgery.

Prior surgery	Group-A		Group-B	
	Number of cases	%	Number of cases	%
Tubal ligation	9	30.00	12	40.00
Laparotomy	0	0.00	1	3.33
Other	2	6.67	2	6.67
None	19	63.33	15	50.00
Total	30	100	30	100.00
P value	0.594 (NS)			

The mean intraoperative blood loss in Group-A was 89.77±6.49 ml and in Group-B was 97.67±12.93 ml which was statistically significant (p-value = 0.005) (Table 6).

The mean intraoperative blood loss in Group-A was 89.77±6.49 ml and in Group-B was 97.67±12.93 ml which was statistically significant (p-value = 0.005) (Table 7).

Table 6: Distribution of cases according to operative time (min).

Operative time (min)	Group-A		Group-B	
	Number of cases	%	Number of cases	%
≤50	20	66.67	10	33.33
51-60	9	30.00	17	56.67
>60	1	3.33	3	10.00
Total	30	100.00	30	100.00
Mean±SD	49.07±6.46		53.40±5.87	
P value	0.009 (S)			

Table 7: Distribution of cases according to blood loss (ml) during surgery.

Blood loss (ml)	Group-A		Group-B	
	Number of cases	%	Number of cases	%
60-90 ml	18	60.00	7	23.33
91-120 ml	12	40.00	19	63.33
>120 ml	0	0.00	4	13.33
Total	30	100.00	30	100.00
Mean±SD	89.77±6.49		97.67±12.93	
P value	0.005 (S)			

Table 8: Distribution of cases according to postoperative complications.

Postoperative complication	Group-A		Group-B	
	Number of cases	%	Number of cases	%
Fever	3	10.00	5	16.67
UTI	3	10.00	2	6.67
BPV	1	3.33	1	3.33
None	23	76.67	22	73.33
Total	30	100.00	30	100.00
P value	0.868 (NS)			

Majority of cases in Group-A 23 (76.67%) and 22 (73.33%) cases in Group-B had no postoperative complication (Table 8).

Most of cases in Group-A 23 (76.67%) and Group-B 20 (66.67%) cases were discharged within 5 days (Table 9).

Table 9: Distribution of cases according to duration of hospital stay.

Hospital stay (days)	Group-A		Group-B	
	Number of cases	%	Number of cases	%
5	23	76.67	20	66.67
6-7	7	23.33	10	33.33
Total	30	100.00	30	100.00
Mean±SD	5.17±0.83		5.30±0.92	
P value	0.558 (NS)			

The mean level of change in Hb was 0.70±0.29 gm/dl in Group-A and was 1.01±0.43 gm/dl in Group-B which was statistically significant (p-value = 0.002) (Table 10).

Table-10: Distribution of cases according to change in Hb (gm/dl).

Change in Hb (gm/dl)	Group-A		Group-B	
	Number of cases	%	Number of cases	%
≤0.5	9	30.00	2	6.67
0.5-1.0	18	60.00	20	66.67
1.0-1.5	2	6.67	3	10.00
1.5-2.0	1	3.33	4	13.33
>2	0	0.00	1	3.33
Total	30	100.00	30	100.00
Mean±SD	0.70±0.29		1.01±0.43	
P value	0.002 (S)			

In Group-A 28 (93.33%) cases and in Group-B 26 (86.67%) cases didn't need any blood transfusion (Table 11).

Table 11: Distribution of cases according to need for blood transfusion.

Blood transfusion needed (WB/PRBC)	Group-A		Group-B	
	Number of cases	%	Number of cases	%
≥ 1	2	6.67	4	13.33
None	28	93.33	26	86.67
Total	30	100.00	30	100.00
P value	0.690 (NS)			

DISCUSSION

Hysterectomy is the most common gynaecological surgery performed for benign etiology worldwide. Hysterectomy can be performed by abdominal, vaginal or laparoscopic approach. Vaginal and laparoscopic procedures are considered minimal invasive surgical approaches because they do not require a large abdominal incision and associated with short hospital stay, and post-operative recovery time compared with open abdominal hysterectomy.[1]

Vaginal hysterectomy is the approach of choice whenever feasible. Most common indication for this surgery is 3rd degree uterovaginal prolapse which is more in parous women. Now with improved surgical expertise, vaginal hysterectomy for non-descent uterus is possible. It is performed through natural orifice with no hole or scar on abdomen. It is easy to master and causes less pain and discomfort to the patient.

Vaginal hysterectomy can be performed by either the conventional way or by hydro dissection. Hydro dissection with saline decreases intraoperative blood loss and creates easier plain of dissection thereby reducing intraoperative and post-operative morbidities. Keeping all these factors in mind, we carried out the study comparing vaginal hysterectomy with hydro dissection and vaginal hysterectomy without hydro dissection to evaluate their pros and cons.

In our study most common age group was 41 to 50 years among both groups. Group-A (VH with hydro dissection) with mean age of 49.63±8.91 yrs and Group-B (VH without hydro dissection) with mean age of 48.03±5.39 yrs. Age group varied from 36 to 71 years.

Our results were comparable to the study done by Hurakadli et al in which 36-50 years was the common age group as of the 267 cases studied.[4] Similar observations made by Sayed et al in which 40-55 years age group was common among both Saline group (vaginal hydro dissection with saline) and no infiltration group (vaginal hydro dissection without any infiltration).[8] In study by Tripathi et al, 30-50 years age group was the most common among both Group- A (cervical vasopressin) and Group-B (no cervical vasopressin).[9]

The increased prevalence in more than 40 years of age could be due to the fact that these women are approaching menopause which is a hypoestrogenic state which makes the pelvic floor muscles and the ligaments that support the female genital tract, weak and atonic and increases the incidence of prolapse**.**

In our study, out of the total 60 cases, 28 had parity P1-P3 and 32 had ≥4 parity. Most of the patients were multipara in both study and control group which was due to the fact that multiparous females have higher chances of prolapsed uterus due to lesser pelvic floor strength due to multiple deliveries and poor nutritional status. Same relation of parity with surgeries was observed by Patil et al in her study in which 70% of the women had parity of 1- 2, and rest 30% had parity ≥3.[10] Also, study done by Tripathi et al shows maximum number of patients were para 4 or above in both Group-A (cervical vasopressin) and Group-B (no cervical vasopressin).[9] POPQ staging of UV prolapse by clinical examination was done and divided in 4 stages I, II, III and IV. UV prolapse was comparable in both groups. Majority of cases i.e., 20 (66.67%) cases in Group-A and 19 (63.33%) cases in Group-B had no associated co-morbidity. Most common associated co-morbidity in Group-A i.e., 3 (10.00%) cases were hypertension. Other associated co-morbidities in Group-A were DM, migraine, PCKD, and hypothyroidism.

Similarly, in Group-B also the M.C associated co-morbidity i.e., 4 (13.33%) cases were hypertension. Other associated co-morbidities in Group-B were asthma, obesity, anemia, DM and hypothyroidism. Singh P and Tripathi et al also studied the relationship of various comorbidities with surgery as they directly affect the parameters to be studied in surgery.[7,9]

In our study majority cases in both the groups i.e., 19 (63.33%) cases in Group-A and 15 (50.00%) cases in Group-B had no previous abdominal surgical procedure.

In present study in Group-A 20 (66.67%) cases had operative time of less than or equal to 50 min, 9 (30.00%) cases had operative time of 51-60 min and in 1 (3.33%) case operative time extended beyond 60 min. While in Group-B 10 (33.33%) cases had operative time of less than or equal to 50 min, 17 (56.67%) cases had operative time of 51-60 min and in 3 (10%) cases, operative time extended beyond 60 min. The mean operative time was significantly reduced in Group-A (49.07±6.46 mins) as compared to Group-B (53.40±5.87 mins). The p-values 0.009 which was statistically significant.

Similar results were observed by Hurakadli et al in which mean duration of surgery was 39.92±5.04 mins in cases with hydro dissection and was 46.30±5.81 mins in cases with no hydro dissection.[4] Our results were also similar to the study by Yeasmin et al in which there was significant decrease in the mean operating time of 46.83±2.30 mins in the cases of vaginal hysterectomy with adrenaline infiltration as compared to 59.18±3.98 mins in the cases of vaginal hysterectomy with no infiltration.[11] In study by Tripathi et al in which Group-A (hydro dissection with vasopressin) had mean operating time of 51.71±7.75 mins and 55±6.75 mins in Group-B (VH with no vasopressin), their study concluded that vasopressin significantly reduces blood loss but does not create plane of dissection so, not effective in reducing the operating time.[9] In study by Singh et al in which Group-A (without hydro dissection) had mean operating time of 56.79±7.91 mins and Group-B (hydro dissection with vasopressin) had mean operating time of 53.91±7.32 mins. [7] They concluded that use of vasopressin during vaginal hysterectomy only reduces blood loss and not operating time.

In our study p-value (0.009) was significant, this could be due to the fact that saline used for hydro dissection causes mechanical tamponade of cervicovaginal vessels and separates plane of tissue prior to the incision being made and hence reduces operating time. In our study the mean intraoperative blood loss was significantly reduced in Group- A (89.77±6.49 ml) as compared to Group-B (97.67±12.93 ml) which was statistically significant as indicated by p-value of 0.005. In study done by Hurakadli et al the mean blood loss was significantly reduced in cases with hydro dissection to a mean of 1.07±0.25 mops when compared to mean of 1.71±0.55 mops in cases with no hydro dissection (p-value of 0.0001, statistically significant).[4] In study by Singh et al the mean blood loss was significantly reduced in cases where local infiltration with vasopressin was done to 138.21±19.64 ml compared to 209.51±21.18 ml in cases where no cervical infiltration was done.[7] Similar results were observed in study done by Calderón-Lara et al where the operative bleeding was significantly reduced to mean of 240.9±111.9 ml in the hydro dissection with epinephrine group compared to the mean of 324.1±104.9 ml in the group with no hydro dissection.[12] In study by Tripathi et al, operating blood loss was significantly reduced to mean of 140.57±33.51ml in hydro dissection with vasopressin group compared to mean of 250±46.90 ml in group without hydro dissection.[9]

Similarly, in study by Sayed et al average blood loss was significantly lower in the saline hydro dissection group to 294.8±96.87 ml compared to 507.31±348.37 ml in the no infiltration group.[8]

In our study, we found that blood loss can be significantly reduced with the use of saline for hydro dissection in comparison to that without hydro dissection, an especially important finding as saline is easily available and does not cause any cardiovascular complication. The difference in amount of blood loss could also be due to different operating surgeons, different methods of hydro dissection, inter-observer variance and different method of calculating blood loss.

In our study majority of cases in both the group i.e., 23 (76.67%) cases in Group-A and 22 (73.33%) cases in Group-B had no postoperative complication. In Group-A and Group B few cases had fever, UTI, BPV after surgery. The p-value was 0.868 which was not statistically significant and both groups were comparable. In study by Patil et al complications were very few.[10] Fever, UTI and headache were seen in 3 (5%) cases. There were no cases of bladder injury, bowel injury and haemorrhage. In our study in Group-A majority i.e., 23 (76.67%) cases and in Group-B i.e., 20 (66.67%) cases were discharged on day 5, and 7 (23.33%) cases and 10 (33.33%) cases were discharged on day 6 or 7 respectively. This was similar to the study by Hurakadli et al in which there was no significant change in duration of hospital stay in groups with VH with or without hydro dissection.[4] In our study the mean level of change in Hb was significantly reduced in Group-A to 0.70±0.29 gm/dl when compared to Group-B of 1.01±0.43 gm/dl. This was statistically significant, p-value of 0.002. This was similar to the study done by Yeasmin et al in which there was no significant fall in hemoglobin concentration in patients undergone vaginal hysterectomy with saline adrenaline infiltration.[11] In his study, mean change in HB was only 0.53±0.23 gm/dl with saline adrenaline infiltration as compared to 1.09±0.28 gm/dl in cases with no infiltration. In Group-A 2 (6.67%) and in Group-B 4 (13.33%) cases needed blood transfusion of greater than or equal to 1 WB/PRBC and majority i.e., 28 (93.33%) in group A and 26 (86.67%) in Group B didn't need any blood transfusion. The p-value was 0.690 which was not statistically significant and both groups were comparable.

CONCLUSION

No surgical procedure in medical science is more gratifying than one finished successfully with minimal blood loss. In modern world, technological advancement and demand for better healthcare services has led to

improvement in the way minimal invasive surgeries like vaginal hysterectomy are performed.

Hydro dissection with saline in vaginal hysterectomy has a role in attaining this ideal. It is associated with significant reduction in duration of surgery, blood loss and lower mean level of change in Hb. Hydro dissection technique can be administered easily and does not require any expensive instruments as saline is easily available and also, it does not cause any cardiovascular complication. Hence, it is recommended that vaginal hysterectomy should be performed with hydro dissection to reduce surgery duration and intraoperative blood loss.

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