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A comparative study of total laparoscopic hysterectomy and non-descent vaginal hysterectomy for treatment of benign diseases of uterus

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Abstract

Background: Hysterectomy is one of the most common surgery performed by Gynecologist. As the time is passing trend is towards those approaches which are minimally invasive, less painful, have less complications, less blood loss and are more cosmetic. Thus total laparoscopic hysterectomy and vaginal hysterectomy have gained popularity. Laparoscopic surgeries require high tech operation theatre setups, sophisticated instruments & high surgical skills. Vaginal hysterectomy descent or non descent is a simple and effective technique for benign pathologies of uterus.

Objective: This study was conducted to compare Total Laparoscopic Hysterectomy and Non Descent Vaginal Hysterectomy with reference to fall in blood haemoglobin level, duration of operation, weight of uterus, post operative complications and post-operative ambulation.

Materials and Methods: Patients undergoing both the types of hysterectomy i.e. TLH and NDVH during September 2017 to March 2018 at Mahila Chikitsalya Hospital (SMS Medical College) were included in the study. Those patients having malignancy as diagnosed by Pap smear or by D & C were excluded from the study. All the patients were investigated thoroughly for their cardio respiratory status, fitness for surgery and other medical conditions. Patients were observed vigilantly during the pre-operative, intra-operative and post-operative period for any complications.

Result: Thirty women underwent TLH, and thirty underwent NDVH. There was no statistically significant difference between groups in the mean age of patients, weight, BMI & literacy rates of patients of both the groups. TLH took significantly longer to perform; however, the estimated blood loss, mean postoperative hemoglobin change & the mean postoperative duration of hospital stay was greater in the VH group. Mean uterine mass was similar in both the groups. While there were no major intraoperative or postoperative complications; the incidence of minor complications were comparable in both the groups.

Conclusion: Maximum number of hysterectomies were done for adenomyosis (AUB A) and Fibroid uterus (AUB L). NDVH takes upper hand than TLH as it is more economic, takes lesser time, requires less surgical techniques in comparison to TLH. On the other hand TLH is associated with small scar of surgery, less morbidity and less post-operative pain. In which way to approach the uterus shall depend upon skill of the surgeon, size and pathological nature of uterus, technology available in the hospital and preference of patient as well as surgeon.

Keywords: Vaginal hysterectomy, total laparoscopic hysterectomy, hysterectomy, fibroid uterus, adenomyosis

Introduction

Hysterectomy is the gynecologic surgery most frequently performed worldwide. The abdominal approach (Total Abdominal Hysterectomy; TAH) was chosen predominantly in the past, while some gynecologists preferred Vaginal Hysterectomy (VH) in selected cases. Recently, an increasing number of minimally invasive approaches, such as laparoscopic and robotic hysterectomy, have been applied [1]. Despite multiple studies stating that vaginal route is preferred to abdominal route in mobile uteri of 12 weeks or lesser, ACOG committee opinion is the only formal guideline establishing the fact [2]. Traditional abdominal and vaginal hysterectomies represent the most and least invasive techniques respectively. The ease and convenience offered by a large abdominal incision have led to the preponderance of abdominal hysterectomy over the vaginal route. Laparoscopic route is associated with increased operating times and rise in the rate of intraoperative injuries [3]. The common belief that bigger, bulky uteri, endometriosis, Pelvic inflammatory disease, previous surgeries, and narrow vagina make vaginal hysterectomy difficult to be performed are not considered to be contra-indications for

non-descent vaginal hysterectomy and can be successfully attempted in all these conditions. It has a clear advantage over the abdominal route in obese women [4]. Abdominal hysterectomy is always comparatively a major surgery than vaginal hysterectomy and the significant complications like paralytic ileus, incisional hernia, infection etc. are significantly less with vaginal route [5]. Laparoscopic hysterectomy is generally classified into three categories: laparoscopic supracervical hysterectomy, LAVH, and TLH. We believe that each procedure can have different outcomes. However, the available literature often includes all categories when reporting on the outcomes of laparoscopic hysterectomy. Laparoscopic hysterectomy has the advantage of visualization of pelvic structure from above and occasional dissection and adhesiolysis. But laparoscopic surgeries requires high-tech Operation Theater (OT) setup, sophisticated instruments and surgical skills. It also increase the financial burden for the patient in comparison to vaginal hysterectomy [6]. Patient preference, skill and expertise of the surgeon and training is important in determining the route of surgery [7]. The aim of our study was to compare the surgical outcomes of women who underwent TLH and VH at a single centre over a given period of time by an almost same team of surgeons.

Materials and Methods:

The study was conducted at the Department of Obstetrics and Gynaecology, Mahila Chikitsalaya Hospital, SMS Medical College and Hospital, Jaipur, from 20th September 2017 to 19th March 2018. Total 60 patients requiring hysterectomy were selected from the Outpatient Department and detailed history elicited and general and systemic examinations performed and confounding variables strictly controlled by following inclusion and exclusion criteria. All patients were thoroughly examined and investigated and malignancies were excluded by Pap smear and or D&C. Patients who had procedures performed in addition to the hysterectomy, such as cystocele or rectocele repair or Burch suspension, were excluded from the study.

All patients were observed minutely during pre-operative, intra operative and post-operative period for any complications. Patient demographic data, operative time (from incision to placement of the final abdominal or vaginal closure suture), mass of the surgical specimen as recorded on the pathology report, estimated blood loss, change in hemoglobin concentration between the preoperative level and the first postoperative day, and length of hospital stay (defined as the total number of in-patient hospital days excluding the day of admission) were recorded. Intraoperative and immediate postoperative complications were defined as complications occurring during surgery and within 1 week of surgery respectively.

Major complications hematoma requiring transfusion or surgical drainage, visceral injury (bladder, bowel, ureter), unintended laparotomy, pulmonary embolism, and major anaesthesia problems. Minor complications included infection or temperature of more than 38° C on two occasions six hours apart (excluding the first 24 hours after surgery), hematoma not requiring transfusion or surgical drainage, deep vein thrombosis, and minor anaesthesia problems. Delayed postoperative complications (> 24 hours after surgery), return visits to emergency room, and hospital readmissions were recorded.

Inclusion criteria

1. Cases of benign diseases of the uterus mainly: fibroid and polyps, adenomyosis, endometriosis, dysfunctional uterine

bleeding.

2. Patients not responding to medical management for at least 6 months & requiring surgical management further, were selected.
3. Patients with age >30 years
4. Patients with clinically uterus of less than 12 weeks size
5. Patients having at least 1 live child.

Exclusion criteria

1. Uterine size more than 16 weeks.
2. Complex adnexal cyst (or>8cm).
3. Prolapsed uterus.
4. Restricted mobility of uterus.
5. Suspicion of genital malignancy

Surgical Technique

All surgeries in the NDVH group were performed with the patient under spinal anaesthesia while in the TLH group under general anaesthesia. All patients received preoperative intravenous prophylactic antibiotic (ceftriaxone 1 g), and all patients had bladder catheterization.

Vaginal Hysterectomy

VH was performed using standard technique. All cases were done under spinal anesthesia. In all cases per vaginal examination was done under anesthesia before starting the surgery to have an idea about size, mobility of uterus and any adnexal mass. With aseptic measures the patients were cleaned and draped. The anterior lip of cervix was held with vulsellum and posterior lip with long Allie's forceps. Circular incision was made around the cervix, pubo-vesico-cervical ligament was cut and bladder mobilized upwards. At the site of previous scar bladder was sharply dissected out and then carefully mobilized upwards by speculum, till the anterior peritoneum covering the uterus is visible as glistening white. In cases of difficulty in separating the bladder the lateral window technique was done. The anterior peritoneum is opened carefully by applying two artery forceps and cutting in between. Posterior pouch was opened subsequently. Uterosacral and cardinal ligaments were clamped, cut and ligated. Bilateral clamping of uterine vessels was done. After clamping and ligating uterine arteries on both sides, if the size of uterus was big then debulking techniques like bisection, coring, myomectomy or a combination of these methods were done to facilitate vaginal delivery of uterus. After delivering the uterus, hysterectomy was completed by applying bilateral cornual clamps, cutting and ligating it properly. All the pedicles are rechecked for any bleeding or oozing and vault is closed meticulously.

Total Laparoscopic Hysterectomy

Before undergoing TLH, all patients had full bowel preparation with clear fluid diet 24 hours prior to surgery. All surgeries in this group were performed under general anaesthesia and Ryles tubes placed in stomach. During surgery, patients were placed in the modified semi-lithotomy position, with knees flexed in Allen stirrups, and deep Trendelenburg position. A Colpo-Probe vaginal fornix delineator with the central metal insert was introduced vaginally to mobilize the uterus and delineate the vaginal fornices. Carbon dioxide pneumoperitoneum was achieved using a Veres needle. The intraperitoneal pressure was maintained at 15 mm Hg throughout the surgery. Four laparoscopic ports were used: 10 mm subumbilical, 5 mm right and left lower quadrant, and 5 or 10 mm suprapubic. The round ligaments were desiccated with bipolar cautery and divided with

monopolar needle cautery. Depending on whether or not the ovaries were to be removed, the utero-ovarian ligaments or the infundibulopelvic ligaments were desiccated and transected. The vesicouterine peritoneum at the level of the vaginal fornix was incised using monopolar needle cautery. With the help of the Colpo-Probe device, the bladder was dissected off the lower uterine segment with clear exposure of the vaginal fornices. The uterine vessels were then thoroughly desiccated and cut at the level of the lateral fornix. Anterior colpotomy was achieved by incising then vagina at the level of the fornix and continuing laterally and posteriorly, freeing the uterus from its vaginal attachments. The specimen was removed vaginally. The vaginal vault was closed laparoscopically or vaginally at the discretion of the surgeon. The patient was assessed for discharge from hospital in the following days and was seen again in the surgeon's office after one week & then six weeks postoperatively.

Operating time was calculated from the start of incision at cervico-vaginal junction to packing of vagina in cases of vaginal hysterectomy and from creation of main port to closure of all port sites in total laparoscopic hysterectomy. Estimation of blood loss was done by counting the number of mops used during surgery and amount of blood in suction bottle. Average size of uterus was assessed clinically in weeks of pregnant uterus & weight of uterus was assessed by weighing the specimens on the same weighing machine postoperatively. Post operative pain on the 2nd day of surgery was noted for all patients and was scaled according to the Visual Analog Scale for pain for all the patients in both the groups and the post operative mobility of the patients was assessed by noting their ambulation in the ward.

Post-operative management:

- (i) IV fluids for 24-36 hrs to maintain hydration;
- (ii) Catheter was kept in situ for 48 hrs in majority. Only in a few patients catheter was kept for longer period either due to a repair or bladder injury;
- (iii) Antibiotics given parenterally for 2 days and then orally for 5 days to prevent infection.
- (iv) Patient was encouraged for early ambulation and regular diet.
- (v) Adequate analgesic was given.
- (vi) Most of the patients were discharged on 4th or 5th post-operative day in case of non-descent VH while on 3rd or 4th day in case of LH as per the general condition of the patient.

On post-operative day 2, hemoglobin estimation was done in all patients. Any post-operative complications, if present were noted. All patients were asked to come for follow up after 15 days and 6 weeks of discharge. Information regarding age, parity, size of uterine, amount of blood loss, duration of operation, complications and hospital stay were recorded. Post operative pain was assessed for all patients and was scaled according to the visual analog scale which is presented as a 100mm horizontal line on which the patient's pain intensity is represented by a point between the extremes of "no pain at all" and "worst pain imaginable" Patient were followed up in Gynecological OPD and were enquired about number of days required since OT to resume professional activities, presence of rectal or vaginal fistula, vault complications like vault prolapsed, urinary complications like incontinence, chronic lower abdominal pain etc. All the factors were analysed by statistical methods e.g. tabulation, proportion & percentage and mean & standard deviation (SD). Appropriate test of significance was

applied (t-test & Chi square test as applicable). P value of < 0.05 was considered significant. Statistical analysis was done by Medcalc software, version 15. 2. 1.

Results

In our study, the mean age of the study population in the TLH group was 38.56 years while in the NDVH group was 40.47 years. Mean weight & mean BMI in the TLH group was 57.96 kg & 25.65 kg/m² while in the NDVH group were 54.63 kg & 25.25 kg/m². Mean parity of the patients was 2.4 & 3.8 in the TLH group & NDVH group respectively. Most of the patients in both the groups were housewives. 2 patients (6.67%) of patients in both the groups had previous Cesarean deliveries. 10 out of 30 (33.33%) patients in the TLH had previous pelvic surgeries (tubal ligation) while only 1 out of 30 (3.33%) patients in the other group had history of ligation. (Table-1)

Table 1: Comparison of Demographic Details between the two groups

Mean Age (years)	38.56	40.47
Mean Weight (kg)	57.96	54.63
Mean BMI (kg/m ²)	25.65	25.25
Mean Parity	2.4	3.8
Literacy(%)	43.3	33.33
Working(%)	26.67	10
Housewife(%)	73.33	90
Prev LSCS(%)	6.67	6.67
Prev pelvic surgeries(%)	33.33	3.33

Table 2 represents that maximum number of patients (63.33%) being operated in both the groups presented with the chief complaint of Abnormal uterine bleeding due to various pathologies, while the other chief complaint for which hysterectomy was done was pain abdomen (26.67%). 10% of the total patients presented with complaints of AUB along with pain abdomen.

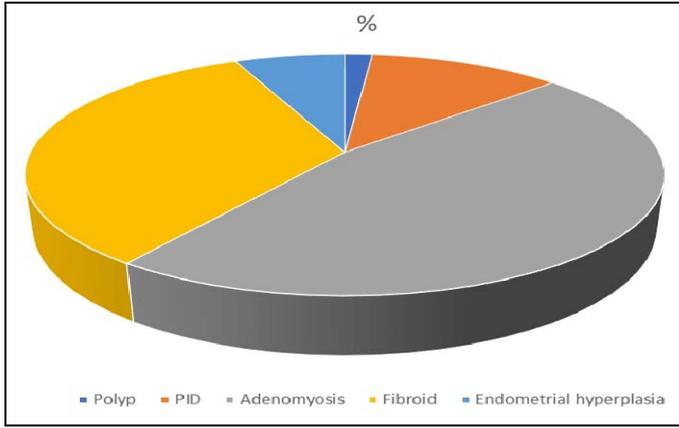
Table 2: Comparison of Chief complaints of patients

Chief Comp	TLH group	NDVH group	Total
AUB (%)	60	66.67	63.33
Pain abdomen (%)	20	33.33	26.67
AUB +Pain abdomen (%)	20	0	10

The most common benign pathology of uterus for which hysterectomy was done in both the groups was Adenomyosis-AUB A (46.67% of total patients) followed by Fibroid uterus - AUB-L (33.33% of all the patients), PID (11.67%), Endometrial hyperplasia (6.67%) & Polyp (1.67%)

Table 3: Comparison of benign pathology of uterus

Indication	TLH group	NDVH group	Total
Polyp (%)	0	3.33	1.67
PID (%)	10	13.33	11.67
Adenomyosis (%)	50	43.33	46.67
Fibroid (%)	36.67	30	33.33
Endometrial hyperplasia (%)	3.33	10	6.67



Graph 1: Comparison of benign pathology of uterus

About 66.67% of uterus that were operated were ~10-12 weeks size of a pregnant uterus, while 6.66% uterus measured >14 weeks (Table 4). Table 5 depicts that bilateral salpingectomy was done in all the patients of both the groups while unilateral ovary of either side had to be removed in 10% of the total patients due to their diseased condition (mainly cystic) while only in 1 patients (~1.67%) bilateral tubes had to be removed.

Table 4: Comparison of average size of uterus operated

Size of uterus in weeks	TLH group	NDVH group	Total
6 weeks (%)	6.67	3.33	5
8 weeks (%)	26.67	23.33	25
10 weeks (%)	30	40	35
12 weeks (%)	33.33	30	31.67
14 weeks (%)	0	3.33	1.67
16 weeks (%)	3.33	0	1.67

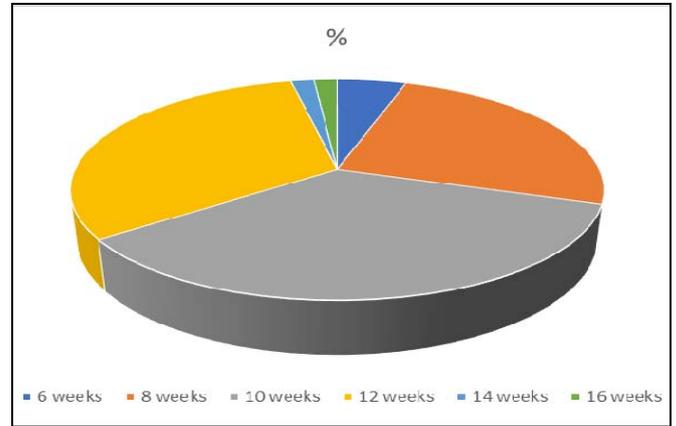


Table 5: Adenexal structures removal

Adenexal Structures removed	TLH group	NDVH group	Total
B/l tubes (%)	100	100	100
B/l tubes with one ovary (%)	13.33	6.67	10
B/l tubes and ovaries (%)	3.33	0	1.67

Table 6 represents the comparisons of various parameters amongst the 2 surgeries. The average weight of the uterus removed in each case the TLH group was 465.93 gms & in the NDVH group was 469.33 gms which is quite comparable ($p=0.759$). Significant difference was observed in the average duration of the surgeries; while TLH took ~100.76 minutes, NDVH took only 71.57 minutes ($p<0.005$). On the other hand, intraoperative blood loss was significantly less in the TLH group than in the NDVH group (86.37 v/s 119.17ml) $p<0.001$. Patients

in the TLH group gained post operative mobility in 3.43 days in comparison to 4.8 days taken by the patients in the NDVH group ($p<0.001$; significant). Similarly the average duration of hospital stay in the TLH group was significantly less (5.7 days) in comparison to the NDVH group (7.13 days). Also the post op pain (assessed by the visual analog scale), average Hb changes and the requirement of post op blood transfusions were significantly less in the TLH group ($p<0.001$) as depicted in Table 6.

Table 6: Comparison of different parameters amongst the two Surgeries

Operative details	TLH group	NDVH group	P value
Avg Wt of uterus (gms)	465.93	469.33	0.759
Avg duration of Surgery (mins)	100.76	71.57	<0.001
Avg blood loss(ml)	86.37	119.17	<0.001
Avg Hb change(gm/dl)	0.56	0.50	<0.001
Avg duration of hospital stay(days)	5.7	7.13	<0.001
Post op pain by VAS (0-10)	2.87	5.2	<0.001
Post op mobility (days)	3.43	4.8	<0.001
Post op Blood transfusion (%)	3.33	6.67	<0.001

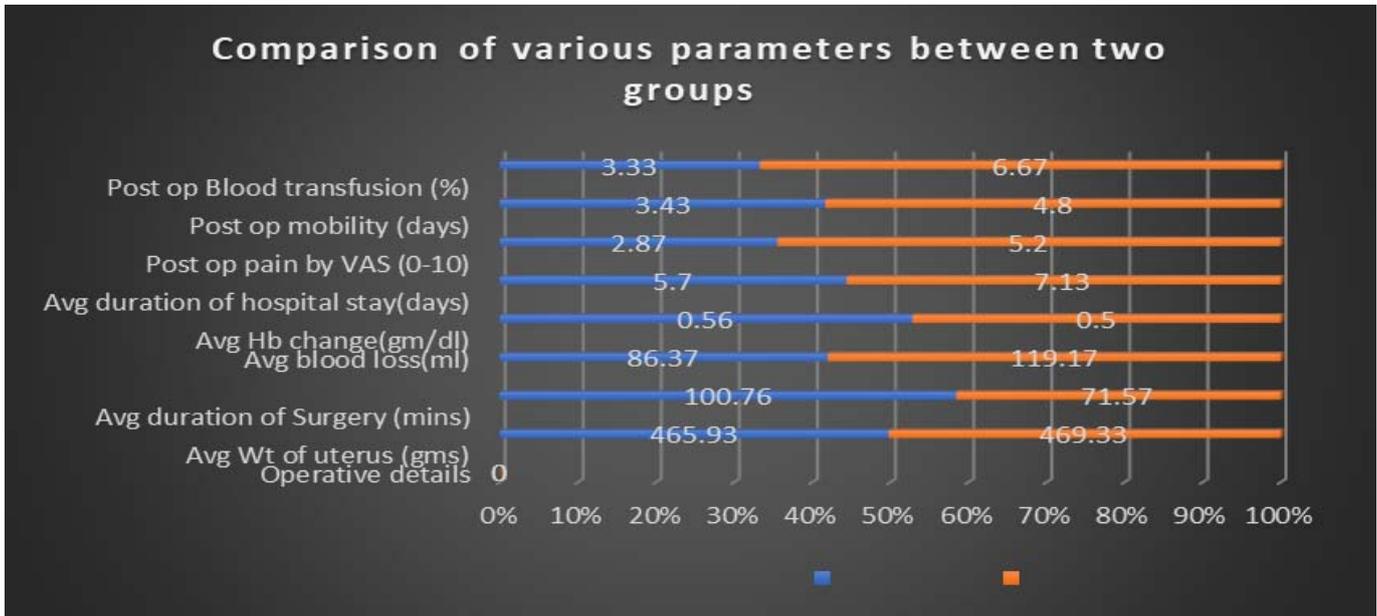
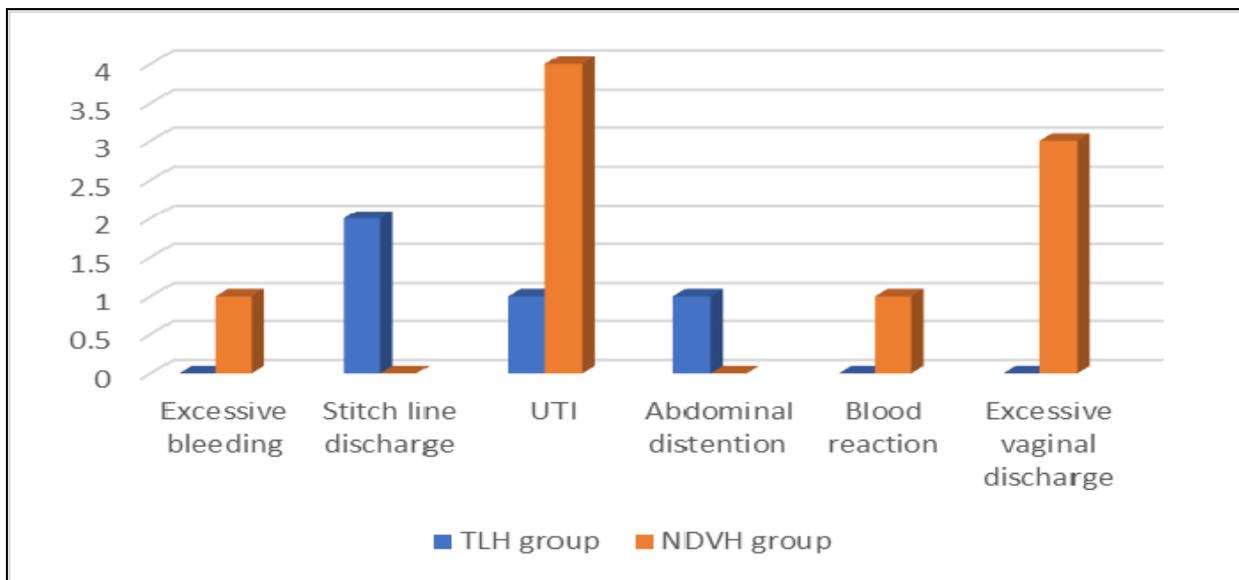


Table 7 shows the comparison of post operative complications amongst both the groups. While no major complication was observed in any patient, minor complications that were managed successfully were noted in some patients. 4 patients out of 30 in the TLH group had symptoms of UTI, 2 patients out of 30 in the NDVH group had stitch line discharge. 3 patients in the NDVH group had complaints of discharge from vault while no patients in the TLH group reported with such complaints

Table 7: Comparison of different Complications of the surgeries

Intra op Comp	TLH group	NDVH group
Excessive bleeding	0	1
Post op Comp		
Stitch line discharge	2	0
UTI	1	4
Abd distension	1	0
Blood reaction	0	1
Excessive vaginal discharge	0	3



Discussion

In our study, the average amount of blood loss in the TLH group was found to be 86.37 ml in comparison to the VH group with an average blood loss of 119.17 ml and hence the difference was found to be statistically significant ($p < 0.05$) Table 6. This finding is similar to the findings of Patel R *et al.* [8] and Roy KK *et al.* [9]. Also significant difference in the drop in Hb levels post operatively was observed in our study between the two groups compared which is similar to the findings of Summit RL *et al.* [10]. But insignificant difference in the amount of intra operative blood loss and Hb changes post operatively were reported by Fuzayel AB *et al.* [6], Shanthi S *et al.* [7] & Chattopadhyay S *et al.* [11].

TLH in our study took almost 100.76 min while VH could be completed in 71.56 min & the difference is significant, similar to many other studies [6, 7, 8, 11]. Significant difference was also observed in the post op pain score, post op mobility and average stay in the hospital post operatively amongst the 2 surgeries such that TLH had better pain relief and early recovery. These findings are in agreement with few other studies [6, 7, 8, 11]. There were no major codmplications during the operative procedures in our intervention which is consistent with the findings of Chattopadhyay S *et al.* [11]. Only 1 case of Vaginal hysterectomy had excessive intraoperative bleeding requiring blood transfusion (Table 7). 3 out of 30 patients in the VH group had UTI post operatively requiring IV antibiotic administration for

few more days than the routine protocol and 3 patients reported excessive vaginal discharge which was managed by chemical cauterization.

The mean age of the patients in the VH group was 40.47 years while in the TLH group was 38.56 years. Maximum patients were illiterate and were housewives with previous normal deliveries (Table 1). Only 1 patient in each group had previous Cesarean section. However the mean parity in the NDVH group was higher (3.8) than the TLH group (2.4). The commonest chief complaint with which the patients who had to undergo the surgery was Abnormal uterine bleeding (63.33%) followed by pain abdomen (Table 2) in both the groups similar to the study of Shanthi S *et al.* [7].

The commonest indication (46.67%) of Hysterectomy in our study was found to be Abnormal uterine bleeding due to adenomyosis (AUB A) followed by Fibroid uterus (AUB L) in about 33.33% of the total patients (Table 3). This finding is similar to the findings of Suhas Shinde *et al.* [12] & Shital Mehta T *et al.* [13] while are dissimilar to the findings of Shanthi S *et al.* [7] & Dewan R *et al.* [14] who have reported Fibroid uterus as the most common indication of Hysterectomy followed by DUB amongst benign pathologies of uterus. Majority of the patients (65%) had uterine size \leq 10 weeks again similar to the findings of Shanthi S *et al.* [7]. Only 2 women had uterine size of 14- 16 weeks. (Table-4). Different de-bulking procedures like bisection, myomectomy, coring or combination of these techniques were used to remove the bigger size uterus. Bilateral tubes were removed in almost all the cases studied, one ovary had to be removed in 10% of the total patients due to some pathology and bilateral ovaries were removed in only 1.67% of cases (Table 5). This clearly depicts our conservative attitude towards preserving the ovaries.

Conclusion

As the days are passing we are concentrating more and more on minimal invasive surgeries thus TLH and or NDVH have gained more importance. NDVH is better in its approach through natural orifice, faster and less expansive. In peripheral hospitals where resources are limited NDVH takes upper hand than TLH as it is more economic, takes lesser time, requires less surgical techniques in comparison to TLH. On the other hand TLH is associated with small scar of surgery, less morbidity and less post-operative pain. TLH can be a better route of surgery in obese patients in whom NDVH may be difficult. TLH can be considered an alternative to Abdominal hysterectomy for those in whom NDVH is not feasible. TLH may be better to NDVH in terms of post-operative parameters and satisfaction, but it has significantly longer operating time and requires laparoscopic surgical skills. Recent advances in equipment, surgical techniques and training have made TLH a well-tolerated and efficient technique. In which way to approach the uterus shall depend upon skill of the surgeon, size and pathological nature of uterus, technology available in the hospital and preference of patient as well as surgeon. In this field still there is huge space for future studies and advancement.

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