

Original Article

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A Comparative Study of Nondescent Vaginal Hysterectomy versus Total Abdominal Hysterectomy

*Siddiqua SF¹, Begum MN², Begum M³, Sarwar SS⁴

Abstract:

Background: Hysterectomy is the most common operation performed for benign uterine conditions. It can be done through abdominal, vaginal and laparoscopic routes^{1,2}. The American college of Obstetricians and Gynaecologists recommends the vaginal approach as the route of choice of hysterectomy for benign disease whenever feasible⁹. Laparoscopic hysterectomy is a preferable alternative to open abdominal hysterectomy for those patients in whom vaginal hysterectomy is not indicated or feasible.

Objective(S): To compare the surgical outcome of total abdominal hysterectomy (TAH) and non-descend vaginal hysterectomy (NDVH).

Methods: This is a cross sectional and comparative study that was conducted from January 2014 to December 2015 in Obstetrics and Gynaecology Department of Sylhet Shaheed Shamsuddin Ahmed Hospital, Sylhet. A Total of 120 patients with benign gynaecological disorder who underwent hysterectomy were included. Among them 60 cases underwent NDVH and 60 cases underwent TAH for similar indication. Main Outcome measures are: i) Duration of operation (min) ii) intra and post-operative complications iii) blood loss (ml) during operation iv) Analgesic requirements v) post-operative hospital stay.

Results: Most of the patients in both NDVH and TAH belonged to age group of 41-50 years. Majority of them were multiparous in both the groups. Medical co morbidities were Diabetes mellitus, Hypertension, Hypothyroidism and most common surgical co morbidities were history of lower segment cesarean section (LSCS), bilateral tubal ligation, laparotomy for benign ovarian pathology. Common indication for hysterectomy in NDVH was abnormal uterine bleeding (AUB) (37%) and in TAH was (18%), fibroid uterus 35% cases in NDVH and 37% in TAH. Mean operative time of NDVH group was 51.08±12.59 minutes while that of women in TAH group was 69.25±11.12 minutes. This difference was found to be statistically significant ($p < 0.05$ when $df = 118$). The mean blood loss in NDVH group was 61.08±18.82 ml while in TAH group was 105.50±38.42 ml, this is also statistically significant ($p < 0.05$). Analgesic required in NDVH group 5.91±0.97 doses and in TAH was 11.58±2.67 doses which is statistically significant ($p < 0.05$). 11(18%) patients developed wound infection in TAH group, but none of the patients of NDVH group developed wound infection which is significant. Post-operative hospital stay in NDVH group was 3.02±1.43 days and those in TAH group was 7.7±3.40 days this is also statistically significant.

Conclusions: NDVH is safe, feasible and effective procedure and associated with less blood loss during surgery, decrease operative time, less intra-operative and post-operative complications with shorter hospital stay as compared total abdominal hysterectomy. Hence NDVH is a better option for females requiring hysterectomy for benign conditions.

Key words: Hysterectomy, abdominal hysterectomy non-descend vaginal hysterectomy.

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Introduction: Hysterectomy is the most common operation performed for benign uterine conditions and can be done through abdominal, vaginal and laparoscopic routes^{1,2}.

4. Dr. Syeda Sharmin Sarwar. Registrar, Dept. of Obs&Gynae, MAG Osmani Medical College, Sylhet.

Corresponding author: Dr. Shah Fahmida Siddiqua
Assistant Professor, Dept. of Obs&Gynae,
MAG Osmani Medical College, Sylhet.
Email: fahmidasiddiquapoppy@gmail.com

1. Dr. Shah Fahmida Siddiqua, Assistant Professor, Dept. of Obs&Gynae, MAG Osmani Medical College, Sylhet.
2. Dr. Mosammath Nazma Begum, Junior Consultant Obs&Gynae, Shaheed Shamsuddin Ahmed Hospital, Sylhet.
3. Mahbuba Begum, Associate Professor, Dept. of Obs&Gynae, MAG Osmani Medical College, Sylhet.

Abdominal route is the most favored route of hysterectomy because of convenience of large abdominal incision but³ it is more invasive and is associated with more abdominal trauma, intra and postoperative complications like fever, pain, wound infection, prolonged hospitalization,

greater hospital charges, slower recovery and delayed resumption of routine life⁴. The suggested advantages of abdominal route are that the tubo-ovarian pathology can be tackled effectively and simultaneously when needed and the operation can be performed by relatively less experienced surgeon. It is difficult to perform in obese patient with higher complication rates⁵.

Current ratio of abdominal to vaginal hysterectomy is 3:1 for treatment of benign disorders. The ratio should be reversed because fewer postoperative complications are associated with the vaginal route, which allow earlier recovery and return to work⁶.

Compared to AH, VH is minimally invasive, has advantages of lesser post-operative pain, rapid recovery and shorter hospital stay^{4,7,8}. The American college of Obstetricians and Gynaecologists recommend the vaginal approach as the route of choice of hysterectomy for benign disease whenever feasible⁹. Thorough review of literature for comparison of the risks and benefits of hysterectomy shows that vaginal approach has potential health and economic benefits of greatly reduced post-operative complications, morbidity and pain.

The selection of route of hysterectomy is mainly influenced by the factors like size of the uterus, capacity of vagina, accessibility to the uterus, extent of the extra uterine disease, need for concurrent procedures and expertise of the surgeon⁹. Vaginal approach greatly reduces complications, decreases hospital stay, lower hospital charges and post-operative comfort is better¹⁰. Vaginal hysterectomy offers cosmetic benefit; in true sense it is a scar less hysterectomy. Vagina is the ideal and most natural route to approach the uterus. Along with the availability of good anesthesia, adequate light, exposure, better suture material and operative technique, exploration of the uterus through vaginal route is becoming popular.

Use of laparoscopic hysterectomy has recently been reported as alternative to traditional abdominal hysterectomy. Laparoscopically assisted vaginal hysterectomy or total laparoscopic hysterectomy are constantly gaining popularity because of superior post-

operative recovery and shorter hospital stay, but these are associated with higher cost and longer duration of operating time and involves large number of specially trained personnel, costly instruments, prolong anesthesia and risks associated with laparoscopy^{11,12}.

With increasing concern over the containment of health care cost, there is need for expanding the indications for performing hysterectomy by vaginal, non-laparoscopic methods.

The once thought contraindications of vaginal hysterectomy like narrow pubic arch, immobile uterus, previous cesarean section, previous pelvic surgery, adhesions, enlarged uterus and need for oophorectomy can be successfully attempted by non descent vaginal hysterectomy^{11, 13, 14}. Extra-uterine diseases such as adnexal pathology, endometriosis, adhesions may preclude vaginal hysterectomy¹⁵.

Several strategies such as bisection, myomectomy, debulking, wedge resection, morcellation and coring have shown to facilitate vaginal hysterectomy in the presence of an enlarged uterus, with no increase in morbidity¹⁶. A number of studies have confirmed that, it is safe to perform a vaginal hysterectomy in the presence of minimal or no uterine descent¹⁵. Most ovaries are visible and readily accessible during vaginal surgery. It is generally safe to perform BSO at the same time of vaginal hysterectomy.

The aim of the current study is to compare total abdominal hysterectomy (TAH) and non-descent vaginal hysterectomy (NDVH) in respect to duration of surgery, bleeding during operation, intra and post-operative complications, hospital stay in women with benign disorders.

Material and Methods:

This is a cross sectional and comparative study which was conducted from Jan 2014 to Dec 2015 in Obstetrics and Gynaecology Department of Sylhet Shaheed Shamsuddin Ahmed Hospital, Sylhet. Total 120 patients with benign gynaecological disorder who underwent hysterectomy were included. The patients were divided in two equal groups by convenient sampling. Among them 60 cases underwent

NDVH and 60 cases underwent TAH. Patient with benign gynaecological disorder with uterine size upto 20 weeks, and adequate mobility like fibroid uterus, abnormal uterine bleeding, chronic cervicitis, adenomyosis, myomatous polyp were included in this study. Patient with uterine prolapse, complex adnexal mass, and malignancy benign pathological conditions with H/O more than one LSCS were excluded from this study. Proper history taking, complete physical as well as pelvic examination were done for every patient. Routine blood and systemic investigations were done. Informed written consent was taken from all patients. After proper pre-anesthetic checkup patients were selected for hysterectomy. All of the patients were operated under spinal anesthesia. All cases were re-assessed in Operation Theater after the patient was anesthetized to confirm the size, mobility of uterus, accessibility of vagina and relaxation of pelvic muscles.

Data regarding age, parity, size of the uterus, indications of surgery, estimated blood loss, length of operation, per operative and postoperative complications, clinical outcome and postoperative hospital stay were recorded properly. Operating time was calculated from the start of incision at cervicovaginal junction to the placement of vaginal pack in case of NDVH and operating time for TAH was calculated from incision on the abdomen to closure of skin incision. Estimated blood loss was calculated by deducting preweighted gauze and mop from blood soaked weighted gauze and mop. Then the weight was transformed in milliliter (1 mg=1ml). The sucker machine collection was also added.

Data were maintained on Microsoft Excel sheet and expressed as percentages, mean and standard deviation, charts as appropriate. Differences in characteristics between patients underwent NDVH vs TAH had been done using unpaired student t-test and Z-test of proportion. P-value of <0.05 was considered as statistically significant value.

Operative techniques:

All cases were operated under spinal anesthesia. In the total abdominal hysterectomy group, after antiseptic painting and draping Pfannenstiel

incision was made. Abdomen was opened in layers; Kocher's clamps were applied to side of bilateral uterine cornu to elevate uterus out of pelvis. Clamps were applied bilaterally to the round and tubo-ovarian ligaments, cut and ligated. Urinary bladder was mobilized to lower limit of cervix after Uterovesical fold was opened. Then subsequent clamps were applied to the uterine artery and bilateral Mackenrodt-uterosacral ligaments were clamped, cut and transfixed. Uterus was delivered out and vault closure was done¹⁷. After securing haemostasis, abdomen was closed in layers.

In the vaginal group, VH was performed using standard technique. Per vaginal examination was done in all cases under anesthesia before starting the surgery to have an idea about size, mobility of uterus and presence of any adnexal mass. With aseptic measures the patients were cleaned and draped. The lips of cervix were held with Allie's forceps. Circular incision was made around the cervix, pubo-vesico-cervical ligament was cut and bladder was mobilized and dissected. Then utero-vesical space was opened. In cases of difficulty in separating the bladder the lateral window technique was done. The posterior pouch was opened subsequently. Uterosacral and cardinal ligaments were clamped, cut and coagulated with bipolar clamp. Bilateral clamping of uterine vessels was done. After delivering the uterus, hysterectomy was completed by applying bilateral cornual clamps, then cutting and coagulating with bipolar clamp properly. All the pedicles were rechecked for any bleeding or oozing and vault was closed meticulously¹⁸.

Results:

Age distribution of both groups are almost similar pattern. Most patients in both NDVH and TAH belonged to age group of 41-50 years. Majority of the women in both the groups were multiparous having parity 3- 5. Nobody had intra-operative complication. There were significant differences in duration of surgery, blood loss, requirement of analgesics, post-operative hospital stay in patients of NDVH and in the patients of TAH. Mean age in NDVH was 44.26 yrs and in TAH was 44.65yrs. Mean parity in NDVH was 3.76 and in TAH was 3.91.

Figure 1: Age distribution of patients in both groups

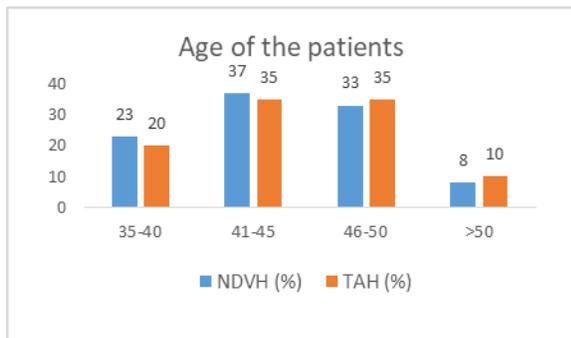


Figure 1 shows: In NDVH 37% patients was in 41-45 years of age group and in TAH it was 35%. 33% of NDVH patients belonged to 46-50 years' age group whereas 35% of TAH group belonged to the same group.

Figure 2: Distribution of parity in both the groups

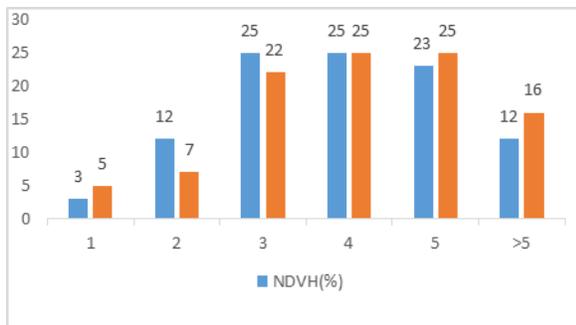


Figure 2 shows: In 25% NDVH cases and 22% TAH cases had para 3, 25% cases of both group had para 4 and 23% NDVH cases and 25% TAH cases had para 5 respectively.

Table 1: Co-morbidities of patients in both groups

Medical co-morbidities	Study group (NDVH) (n=60)	Control group (TAH) (n=60)
Diabetes Mellitus	18(30%)	18(30%)
Hypertension	13(22%)	11(18%)
Hypothyroidism	04(10%)	05(8%)
Bronchial Asthma	02(3%)	02(3%)
Diabetes with Hypertension	05(8%)	06(10%)
None	18(30%)	18(30%)
Surgical co-morbidities	Study group (NDVH) (n=60)	Control group (TAH) (n=60)
LUCS	12(20%)	12(20%)
Laparotomy	07(12%)	08(13%)
BLTL	09(15%)	08(13%)

Table 1 shows: Common medical comorbidities were Diabetes mellitus, Hypertension, Hypothyroidism and most common surgical comorbidities were history of LSCS, bilateral tubal ligation, laparotomy for benign ovarian pathology

Table 2: Indication for Hysterectomy in both groups

Indication	Study group (NDVH) (n=60)	Control group (TAH) (n=60)
Abnormal uterine bleeding	22(37%)	18(30%)
Fibroid uterus	21(35%)	22(37%)
Adenomyosis	08(13%)	08(13%)
Myomatous polyp	05(8%)	02(3%)
Cervical polyp	02(3%)	04(7%)
HSIL	01(2%)	03(5%)
Elongated cervix	01(2%)	0(0%)
Endometrial polyp	0(0%)	03(5%)

Table 2 shows: Common indication for hysterectomy in NDVH group was AUB (37%) whereas in TAH group it was fibroid uterus (37%). In NDVH group second common indication was fibroid uterus (35%) and in TAH group it was AUB (30%).

Table 3: Size of Uterus in both groups

Size of uterus (in weeks)	NDVH (n=60)	TAH (n=60)
Upto 08 weeks	17(28%)	19(32%)
10 to 12 weeks	22(37%)	15(25%)
14to 16 weeks	16(27%)	23(38%)
>16 weeks	05(8%)	04(7%)

Table 3 shows: In 37% NDVH cases Uterus was of 10-12 weeks' size whereas in 38% of TAH cases uterus was 14-16 weeks' size.

Table 4: Procedures used in exteriorizing the uterus during NDVH (n=60)

De-bulking procedure	No of the patients (%)
Bi-section	24(40%)
Myomectomy	16(27%)
Morcellation	08(13%)
Combined	04(7%)
Intact uterus	08(13%)

Table 4 shows: De-bulking procedure used in NDVH was bi-section in 24(40%), myomectomy in 16(27%), and morcellation in 08(13%) cases.

Table 5: Primary outcome of patients in both groups

Outcome	NDVH Mean±SD	TAH Mean±SD	t-value	p-value	Level of Significance
Operative time (minutes)	51.08±12.59	69.25±11.12	8.65	<0.05	Significant
Blood loss (ml)	61.08±18.82	105.50±38.42	8.0	<0.05	Significant
Analgesic requirements (doses)	5.91±0.97	11.58±2.67	15.75	<0.05	Significant
Post op. hospital stay (days)	3.02±1.43	7.7±3.40	9.96	<0.05	Significant

Table 5 shows: Mean operative time of NDVH group was 51.08±12.59 minutes and in TAH group was 69.25±11.12 min. The mean blood loss of subjects in NDVH group was 61.08±18.82 ml and in TAH group was 105.50±38.42 ml. For the patient of NDVH mean analgesics doses required 5.91±0.97 and in TAH it was 11.58±2.67 doses. The mean duration of post-operative hospital stay for women of NDVH group was 3.02±1.43 days and in TAH group was 7.7±3.40 days. All these observations were found to be statistically significant (p<0.05 when df 118).

Table 6: Postoperative complications in both groups

Complications	NDVH (%)	TAH (%)	z-value	P-value	Level of significance
Febrile morbidity	8%	12%	0.76	>0.05	Not significant
UTI	4%	8%	0.92	>0.05	Not significant
Wound infection	0%	18%	3.6	<0.05	Significant
Rectus sheath hematoma	0%	5%	1.7	>0.05	Not significant

Table 6 shows: 11 patients developed wound infection in TAH group, but none of the patients of NDVH group developed wound infection which is significant (>0.05). Other post-operative

complications in NDVH group was fever (8%), UTI (4%), rectus sheath hematoma (0%) and in TAH group fever (12%), UTI (8%), rectus sheath hematoma (5%) which are not significant statistically (p>0.05%).

Discussion: In earlier days' vaginal hysterectomies were done only for uterine prolapse but now it can easily be performed in other benign pathological conditions of uterus. It is well-known fact that 70-80% of the hysterectomies done for benign conditions are performed abdominally while vaginal hysterectomy was usually being performed for uterine prolapse¹⁹. In this study patients having NDVH and TAH belonged to age group of 41-50 years. Majority of the women in both groups were multiparous having parity 3- 5. No significant association was found between age and parity as similarly observed by Deshpande et al²⁰ and L Benassi et al²¹. A Study was done by Rupali D et al²² which included 50 cases of NDVH out of them 54% of the patients were in the age group of 41-45 years and 46% patients were para 3. Though higher parity and advancing age are the favourable factors for vaginal hysterectomy but no statistically significant association was found in this study. Medical comorbid conditions like Diabetes melitus, Hypertension, Bronchial asthma, Hypothyroidism and Hyperthyroidism and surgical co-morbidities like previous H/O LSCS, Laparotomy and BLTL were not significantly associated with TAH or NDVH. Similar findings were also seen in a study conducted by Hoffman MS, De Cesare S, Kalter C in 1994²³. It is observed that most common indication for hysterectomy in study group was (37%) Abnormal uterine bleeding (AUB) and in control group was Fibroid uterus (37%). The second most common indication was fibroid uterus (35%) in NDVH and AUB (30%) in TAH. Other indications were Adenomyosis, PID, myomatous polyp and HSIL. These were comparable to the study conducted by Neerja G et al²⁴ that showed maximum cases of NDVH were operated for fibroid uterus (47%), DUB (19%). Adenomyosis (5%), and endometrial hyperplasia (4%). A similar study performed by Rupali D et al²² showed fibroid as a most common indication for hysterectomy in both groups²⁵.

Previously NDVH was contraindicated in uterus >12 weeks but in hands of well trained and skilled gynaecologist NDVH is possible even in larger sized uterus. In this study 28% patients had uterus 8weeks size, 37% women had uterus 10-12weeks, 27% patients had uterus 14-16 weeks and 8%NDVH women had uterus >16 weeks. With the techniques like bisection, wedge resection, morcellation and myomectomy NDVH has become easy to perform even in enlarged uterus >20 weeks. In this study bisection was done in 40% cases, myomectomy in 27% cases, morcellation in 8% and combined procedure were done in 4% cases. In large uteri, NDVH using these methods have been shown to be safe with no added morbidity in terms of blood loss and visceral injury when compared with vaginal and abdominal hysterectomy for uteri of normal size. Vaginal hysterectomy is associated with a low occurrence of complications, morbidity and mortality. But like any other surgical procedure it has its own complications some of which are unique to the route of surgery. Incidence of complications was 70% less in vaginal route compared with abdominal route.

In this study mean operative time for NDVH was 51.08 ± 12.59 minutes and in TAH was 69.25 ± 11.12 minutes ($p < 0.05$) which is significantly less compared to TAH group. Rohidas P. Chavhan et al¹³ and other studies²⁶⁻³⁰ have shown similar results where NDVH was performed in significantly lesser time. This results depends upon the size of the uterus, any previous pelvic surgery leading to adhesion and experience of the operating surgeon³¹. Mean blood loss in this study was significantly less for NDVH group compared to TAH group. In NDVH group it was 61.08 ± 18.82 ml and in TAH group 105.50 ± 38.42 ml ($p < 0.05$). Balakrishnan D et al²⁸ and Abrol S et al²⁷ observed similar findings where the amount of blood loss was significantly less in the NDVH group. This observation was similar to previous studies^{28,29,32}. Postoperative analgesics were required in all patients in different doses. NSAID was used as analgesic in all patients. Analgesic requirement in NDVH group was significantly less (5.91 ± 0.97 doses) ($p < 0.05$) compared to TAH group (11.58 ± 2.67 doses). This observation was supported by previous

studies which also showed less post-operative pain and less requirement of analgesics in NDVH group compared to abdominal hysterectomy²¹.

Patients were discharged from the hospital after improvement of physical condition. It was observed that the NDVH group had shorter postoperative hospital stay than TAH group ($p < 0.001$). Hence the financial burden was also considerably reduced on the patients. Rosy et al (2017)³³ also found similar results in their case control study of non descent vaginal hysterectomy versus total abdominal hysterectomy which was conducted on one hundred and fifty patients.

Postoperative complications were more after abdominal hysterectomy in comparison to NDVH group. Majority of the patients after abdominal hysterectomy complained of pain and they needed significant doses of analgesics (11.58 ± 2.67), while less (5.91 ± 0.97) analgesics doses required in study group. 12% women experienced fever in TAH group and 8% women in study group respectively. Wound infection rate was observed significantly less (0%) in study group than the control group (18%). UTI and rectus sheath hematoma were less in NDVH group (4% and 0%) than TAH group (8% and 5%). Furthermore, it is observed that all the discussed postoperative factors are important factors which influences the selection of the procedure. Henceforth, the technique of non-descent vaginal hysterectomy (NDVH) which showed less intraoperative and postoperative complications and morbidity is considered better than conventional abdominal hysterectomy. Study by Neerja G et al and Singh A and colleagues showed that no major postoperative complications were encountered in any of the cases operated through vaginal route.

Conclusion: NDVH is safe and practical procedure when compared with TAH. Non-descent vaginal hysterectomy is associated with less blood loss during surgery, decrease operative time, less intra-operative and post-operative complications with shorter hospital stay as compared with total abdominal hysterectomy. The decrease in the blood loss reduces the need for blood transfusion and related hazards. The shorter hospital stay

reduces the economical burden over the patients and society. In summary, it is feasible and effective procedure. It can be elementarily concluded that NDVH triumphs over AH with patient favorable outcome and should be the choice of operative procedure. NDVH is a better option for females requiring hysterectomy.

Declarations:

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Conflict of Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Availability of data and materials: The datasets analyzed during the current study are not publicly available because of having no permission from the hospital from where data were collected.

Author's contributions: SFS contributed to data acquisition, conception and design of the study, data analysis, data interpretation and menu script writing. MNB contributed to data acquisition, design of the study, data interpretation data analysis. BM contributed to final checking of manuscript. All authors have approved the submitted version of the manuscript.

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