

## Comparative Study between Non Descent Vaginal Hysterectomy and Abdominal Hysterectomy- A Prospective Study

Dr. Balwinder Kaur, M.D., Associate Professor, Dept. of Gynaecology and Obstetrics Govt Medical College, Patiala, Punjab India

Dr. Manjit Kaur Mohi, M.D., Professor, Dept. of Gynaecology and Obstetrics Govt Medical College, Patiala, Punjab India

Dr Rosy Bansal, M.D., Ex. Junior Resident, Dept. of Gynaecology and Obstetrics Govt Medical College, Patiala, Punjab India

Dr. Manjeet Kaur, M.D., Ex. Professor, Dept. of Gynaecology and Obstetrics Govt Medical College, Patiala, Punjab India

**Correspondence Author:** Dr Rosy Bansal, M.D., Ex. Junior Resident, Dept. of Gynaecology and Obstetrics Govt Medical College, Patiala, Punjab India.

**Conflicts of Interest:** Nil

### Abstract

#### Introduction:

Hysterectomy is the most common major gynaecological surgery. Can be done by abdominal or vaginal route or laparoscopically. Laparoscopically assisted vaginal hysterectomy (LAVH) is increasing, but is costly, takes longer time and needs expertise. Vaginal route should be used for indications other than prolapse. Only limitation of NDVH, large sized uterus, can be overcome by morcellation, bisection etc. Vaginal hysterectomy has less febrile morbidity, less bleeding, shorter stay and faster convalescence than abdominal hysterectomy.

#### Material and Methods:

100 patients with benign uterine disorders enrolled and divided into two groups. Group A: 50 patients underwent NDVH. Group B: 50 patients underwent total abdominal hysterectomy. All were given prophylactic antibiotics, done under combined spinal epidural anaesthesia. NDVH was done by 1. Using clamps 2. Clampless. Diclofenac sodium 50 mg im given before leaving theatre, 2 more doses given 8 hrs apart.

#### Results and discussion:

(1) **Intraoperative injury:** Bladder (4% of TAH) and NDVH (no injury), p value 0.153, not significant. (2)

**Blood transfusion:** NDVH (1), TAH (4), p value 0.169, not significant. (3) **Mean Hb Fall:** NDVH (Preoperative Hb 10.64 gms%, Postoperative 10.32 gms%). TAH (Preoperative 11.44 gms%, postoperative 9.68 gms%) Difference statistically significant, p value 0.0061. (4)

**Mean duration of surgery:** 91+/-24.83 minutes (NDVH), 137.55+/-30.8 min (TAH), p value <0.001 Significant. (5)

**Mean Blood loss** 98.8+/-43.34 ml (NDVH), 240.0+/-166.17ml (TAH) p value <0.001 Significant. (6)

**Mean post-operative stay** 3.38+/-0.99 days (NDVH) and 5.89+/-4.11 days (TAH) p value <0.001, significant. (7)

**Pain:** 1.28/-2.27 (NDVH), 5.75+/- 2.24 (TAH) p value <0.0001, highly significant. (8)

**Mean No. of threads used** 3.22+/-0.42 (NDVH) and 4.75+/-0.71 (TAH) p value <0.0001 statistically highly significant.

**Conclusion:** NDVH is safe, feasible, and cost effective and provides more comfort to patient without increasing duration of surgery, blood loss, intraoperative and postoperative complications.

**Keywords:** Benign, Hysterectomy, Laparoscopic, Non descent, Morcellation, Vaginal.

## Introduction:

Hysterectomy is the most frequent major gynaecological surgery. It is removal of all or part of the uterus [1]. It may be done by abdominal or vaginal route or laparoscopically [2]. Laparoscopically assisted vaginal hysterectomy (LAVH) is increasing, but it is costly, takes longer time. And all the more needs expertise. Abdominal hysterectomy is most popular with 70:30 ratio for abdominal versus vaginal hysterectomy [3] now days, a spectrum of approaches is available for performing hysterectomy. Vaginal route should be used for indications other than prolapsed. Only limitation of NDVH, larger size can be overcome by various techniques like morcellation, bisection, myomectomy [4] and Lash technique/coring [5]. By above techniques uterus upto 16 weeks can be removed without any increase in surgical complications, blood loss, operating time or hospital stay.

Indications [2] 1. **Benign diseases:** Abnormal uterine bleeding, Leiomyoma, Adenomyosis, Endometriosis, Prolapse PID, Cervical polyp: 2. **Pre malignant and malignant diseases:** CIN, Invasive cervical cancer, atypical endometrial hyperplasia, endometrial cancer, Ovarian cancer, Fallopian tube cancer, Gestational trophoblastic tumours

**Indications of non descent vaginal hysterectomy** [6,7]: Dysfunctional uterine bleeding, Fibroid, Adenomyosis, Chronic pelvic pain, Post menopausal bleeding, Cervical dysplasia, Cervical polyp.

**Factors responsible for deciding abdominal route for hysterectomy** [8]

1. Uterus > 12 weeks
2. Vagina too narrow
  - A. Pubic arch < 90°
  - B. Bituberous diameter < 8.0 cms

3. **Conditions contra indicating vaginal approach:** PID, Endometriosis, Adnexal disease, previous pelvic surgery or caesarean section, restricted mobility of uterus, Lack of experience.

4. **Previous caesarean/ surgeries** [9,10] is a relative contraindication for VH, due to risk of bladder adhesions esp in uterovesical fold. Extra care during surgery is needed. Broad ligament space lateral to cervix (surgical window) can be used for dissection as lateral 1/5<sup>th</sup> on both sides is free of adhesions and central 3/5<sup>th</sup> may be densely adherent.

5. **Restricted mobility** is unfavourable for.

6. **Angle between lateral cervical surface and ascending uterine wall from the cervix:** Smaller the angle (< 140), greater the difficulty in performing VH. Angle can be assessed by examining fingers.

7. Contracted bony pelvis (bituberous diameter < 9 cms and pubic arch < 90°). Narrow vagina (< two fingers breadth especially at apex)

8. VH requires more skill.

9. Oophorectomy [11]

Oophorectomy during abdominal hysterectomy is more common than vaginal hysterectomy. It depends on surgeon's skill and experience. When adnexa to be removed, the round ligaments should be cut separately. Then by applying traction on utero-ovarian pedicle, ovary is drawn into field by grasping with Babcock, infundibulopelvic ligament clamped and excise ovary and tube and place transfix suture. LAVH can be done in case of difficulty. Vaginal approach should be considered first followed by laparoscopic conversion of VH and lastly abdominal hysterectomy.

Absolute contraindications of NDVH [6,7] (1). Uterus > 20 weeks (2). Previous VVF/RVF (3) Cervix flushed with vault (4) Adnexal pathology (5) limited vaginal space

(6) Severely restricted uterine mobility (7) Poor preoperative score

Techniques of NDVH [9] (1) Basic technique by use of clamps (2) Clampless procedure

1. Complications of abdominal hysterectomy:<sup>[2]</sup> blood loss is > than NDVH requiring BT, Bladder/bowel/ureter injury, infection and visible scar on the abdomen.

2. Complications of NDVH [12]: Failed VH OR conversion to laparotomy, haemorrhage requiring BT (less common than VH), Bladder/ ureter/Rectal injury. Vault hematoma, postoperative vaginal bleeding, embolism/ MI.

Vaginal hysterectomy has less febrile morbidity, less bleeding necessitating blood transfusion, shorter hospital stay and faster convalescence than abdominal hysterectomy. There is evidence of lower morbidity and quick recovery in VH than TAH [13]

#### Material and Methods:

This prospective study was done in Department of Obstetrics and Gynaecology, Govt. Medical College, Patiala. After approval from the institutional ethics committee and informed consent of the patients.

100 patients with benign uterine disorders enrolled and divided in to two groups. Group A: 50 patients underwent NDVH. Group B: 50 patients underwent total abdominal hysterectomy.

Indications: Abnormal uterine bleeding, endometriosis, PID, unexplained pelvic pain, DUB, fibroid, cervical dysplasia, chronic cervicitis, Adenomyosis.

Exclusion criteria for both NDVH and TAH were genital malignancy.

Exclusion criteria for NDVH: (1) Previous 2 or more LSCS, (2) adnexal mass, (3) uterus > 12 weeks, (4) weight > 300 gms, (5) volume > 350 cm<sup>3</sup>, (6) pubic arch < 90°, transverse diameter more than anteroposterior diameter, (7) uterocervical angle < 140°.

Complete history, GPE, Pelvic examination, investigations including USG and PAP smear were taken. Informed consent taken. All patients were given prophylactic injection amoxyclav 2.4 gm with gentamycin 80 mg i.v or Injection Cefazoline 2 gms with gentamycin 80 mg iv at time of induction of anaesthesia. All patients were done under combined spinal epidural anaesthesia and were reassessed. NDVH was done in usual manner. In case of difficulty, uterus was bisected, morcellated. Two important and difficult technical steps in NDVH are: Entrance into cul de sac and examination of all uterine attachment.

Two methods were used for NDVH (1). Using clamps (2). Clampless (ligate the pedicles with polyglactin 910 no. 1-0 threads followed by cutting pedicles)

TAH: Abdomen opened by suprapubic transverse incision. TAH was done as usual. Vault closed by interrupted sutures and abdomen in layers.

Injection diclofenac sodium 50 mg im given before leaving theatre and repeated for 2 more doses 8 hrs apart.

**5. Intra-operative observations:** (1) Uterine size and adnexa (2) Blood loss, by weighing all soaked swabs (3) Number of threads used. (4) Any difficulty during procedure. (5) Intra operative blood transfusion (6) Complications like bladder, bowel and ureter injury (7) Conversion to laparotomy (8) Length of operating time was recorded as the time from the surgical incision to time of closure. (9) Uterus volume (length\* breadth \* AP diameter \* 0.542) and weight.

**Postoperative observations:** (1) Temperature recorded 4 hourly. Febrile morbidity (oral temperature of 100° F or >) from 1st post-operative day to date of discharge excluding first 24 hours after operation was recorded. (2) Post-operative haemoglobin estimated on 2<sup>nd</sup> postoperative day (3) Post-operative abdominal pain after 24 hrs of surgery. Pain assessment tool: LACC Scale was used (4) Other

post operative morbidities as haemorrhage, UTI, haematuria, abdominal wound and, vaginal vault infection, paralytic ileus, chest infection etc noted. (5). Duration of hospital stay from operative day up to and including the day of discharge was noted. (6). Criteria for discharging patient: Afebrile for 24 hrs, normal bladder and bowel functions. (7). after discharge, follow up done after 1 and 6 week.

**Results:**

Study was conducted on 100 patients. 50 underwent NDVH and 50 TAH. Comparison of intra-operative and postoperative complications was done by collected data. Results expressed in mean +/- standard deviation, chi-square, t test and p value.

(1).Previous surgery: NDVH group, 14 cases were of b/l tubectomy and 2 abdominal surgery not due to pelvic pathology. TAH Group: 10 cases had LSCS, 7 B/L tubectomy, 3 laparotomy and 2 abdominal surgeries not due to pelvic pathology.

(2)Uterine Size: NDVH group: 86% had > or = 12 weeks and 14 % > 10 weeks. TAH gp , 50% had size < 10 weeks, 50% > 10 weeks

(3)Bisection done in 5 (10%), coring in 1 [2%], myomectomy in 6 (12%) and combined in 2 (4%) cases.

(4)In 10 (20%) cases, clampless NDVH was done and in 40 (80%) cases, was done using clamps.

(5)No Oophorectomy in NDVH group. In TAH Group, 16 cases underwent bilateral oophorectomy and 6 U/L Oophorectomy.

(6)Intraoperative injury: In our study, 2 [4%] patients with h/o previous LSCS, had bladder injury in TAH group. In NDVH Group, no bladder injury. No intraoperative bowel and ureter injury in both groups. Chi square value was 2.04 and p value was 0.153. Difference not statistically significant.

(7) 1 case in NDVH Group and 4 in TAH required intraoperative blood transfusion. Difference not statistically significant, p value 0.169.

**Table 1: Duration of surgery (minutes)**

Duration of surgery (minutes)	NDVH		TAH		t value	Df	P value
	No. of cases	%	No. of cases	%			
<or =60	7	14	-	-			
61-90	29	58	2	4			
91-120	9	18	23	56	9.1016	98	<0.0001
121-150	4	8	12	24			
>150	1	2	13	26			

Table 1: In NDVH gp, 14% had duration < OR =60 minutes, 58 % ( 61-90 min), 18% (91-120 minutes), 8% (121-150 minutes) 2% > 150 minutes. In TAH group, 4% had duration between 61-90 minutes, 56% (91 -120 min), 24% (121-150 min) and 26% >150 minutes. Difference statistically significant p value <0.0001.

**Table 2: Blood loss (ml)**

Blood loss (ml)	NDVH		TAH		t value	Df	P value
	No of cases	%age	No of cases	%age			
<100	31	62	2	4	5.8139	98	< 0.0001
100-200	18	36	34	68			
>200	1	2	14	28			

Table 2: NDVH GP: 62 % had < 100ml, 36 % between 100-200ml and 2% had >200ml.

TAH group: 4% had blood loss < 100ml, 68 % between 100 to 200 ml and 28% > 200ml. Difference statistically significant, p value < 0.0001.

**Table 3: Number of polyglactin 910 threads (No. 1-0) used**

Type of surgery	Mean	t value	Df	P value
NDVH	3.22	12.97	98	< 0.0001
TAH	4.75			

Table 3: In NDVH GP. Minimum number of threads used was 3 and maximum 4.

In TAH group minimum no. of threads was 4 and maximum 6. Difference, statistically significant, p value < 0.0001. So NDVH was cost effective than TAH.

**Table 4: Postoperative HB**

Type of surgery	Mean postoperative HB	t value	Df	P value
NDVH	10.32	2.8019	98	0.0061
TAH	9.68			

**Table 4: Mean preoperative HB in NDVH was 10.64 gms % and in TAH 11.44 gms%. Mean post operative HB in NDVH was 10.32 gms% and in TAH 9.68 gms%. Difference in fall of Hb after opt was statistically significant, p value 0.0061.**

**Table 5: Postoperative Abdominal pain**

Pain	NDVH		TAH		Chi-square	Df	P value
	No of cases	%age	No. of cases	%age			
Present	15	30%	44	88%	34.8	1	<0.0001
Not present	35	70%	6	12%			

Table 5: Postoperative pain was present in 30% cases of NDVH and 88% of TAH. Difference statistically significant, p value < 0.0001.

**Table 6: Duration of postoperative stay.**

Duration of stay(days)	NDVH		TAH		t value	Df	P value
	No of cases	%	No of cases	%			
3-4	43	86%	26	52%	4.1931	98	<0.0001
5-7	7	14%	12	24			
8-10	0	0	7	14			
>10	0	0	5	10			

Table 6: NDVH GP: Stay was between 3-7 days. . 86% (NDVH GP )had stay between 3-4 days and 14 % between 5 -7 days. In TAH gp stay was between 3 -23

days. 52% had between 3-4 days , 24% 5-7 days , 14 % between 8-10 days and 10% >10 days. Difference in PO stay between two gps was statistically significant, p value < 0.0001.

**Table 7: Comparison of outcome between NDVH and TAH**

Factors	Type of surgery	Mean+/-SD	t value	Df	P value
Time (min)	NDVH	91+/-24.83	9.1016	98	<0.001
	TAH	137.55+/-30.8			
Blood loss(ml)	NDVH	98.8+/-43.34	5.8139	98	<0.001
	TAH	240.0+/-166.17			
Duration of stay(days)	NDVH	3.38+/-0.99	4.1931	98	<0.001
	TAH	5.89+/-4.11			
Pain	NDVH	1.28/-2.27	9.6677	98	<0.0001
	TAH	5.75+/-2.24			
No of threads used	NDVH	3.22+/-0.42	12.97	98	<0.0001
	TAH	4.75+/-0.71			

Table 7: Difference in duration of surgery, blood loss, duration of postoperative stay, was significant, p value < 0.001 and for postoperative pain and number of polyglactin 910 threads between the NDVH and TAH GPS was statistically highly significant, p value < 0.0001.

Postoperative complications: (1) 8% patients in NDVH and 6% in TAH had UTI. (2) 4% cases (NDVH) and 8% (TAH) had vaginal infection. (3) 6% of both NDVH and TAH gp. had Secondary haemorrhage (4) 4% in each gp had fever. (5)8% of TAH patients had Abdominal wound infection, out of which, 4% required resuturing. Chi square value was 4.61% and p value 0.33. No significant difference.

Vault infection: 3 cases of NDVH and 3 of TAH GP had vault induration. P value was 1

**Discussion:**

This Prospective Study was conducted in Dept of Obstetrics and Gynaecology Govt. Medical College, Patiala. 100 patients Enrolled. 50 (Group A) underwent



NDVH and 50(Group B) underwent abdominal hysterectomy. Age was comparable in both groups.

Previous surgical history: In our study, 14 cases (NDVH gp) had H/O of B/L tubectomy and no other Pelvic surgery. In TAH GP, 10 had LSCS, 7 B/L tubectomy and 3 had laparotomy. Garg et al<sup>[14]</sup>, showed 1 case of LSCS (NDVH) and no case of LSCS (TAH). Study by Singh and Bansal<sup>[15]</sup> showed, out of 15 cases of previous pelvic surgery (NDVH GP), 13 had undergone tubectomy and 2 LSCS. In TAH, out of 15 cases, 14 had tubectomy and one LSCS. Our study is comparable with Singh and Bansal.

Uterine size: 86 % (NDVH) had size < or =10 weeks and 14% (NDVH) had size > 10 weeks. In TAH gp 50% had < or = 10 weeks size and 50% > than 10 weeks. In the NDVH GP size was < or = 10 weeks in our study as well as in studies by Bharatnur<sup>[16]</sup> and Singh and Bansal. Various techniques were used in NDVH for easy removal of ut in > or = 10 weeks size and also in adenomyosis. In our study, Bisection in 10 % ( 5), coring 2 % ( 1). Myomectomy 12 % ( 6) and combined in 4 % ( 2). Deewan et al<sup>[17]</sup> did bisection in 34% and combined in 40%. Bhadra et al<sup>[18]</sup>. Did bisection in 43.03 and combined in 36.7% cases. Methods used in NDVH: 10(20%) NDVH was done by clampless method and 40(80%) by using clamps. Clampless method done by ligating pedicles with threads and then cutting pedicles with scissors.

**Table -8: Duration of surgery (min.)**

Author	NDVH (min)	TAH (min.)
Garg et al <sup>[14]</sup>	41	92
Bharatnur <sup>[16]</sup>	65	101
Present study	91	137

Table 8: Garg et al<sup>[14]</sup> ) showed, mean time for NDVH was 41 min. and for TAH was 92 min., Difference statistically significant. Bharatnur<sup>[16]</sup> showed, mean time

taken for NDVH was lesser than TAH. Our study showed, mean time for NDVH was 91 min. and TAH was 137 min. NDVH requires experience, as proved by our study. Initially more time was taken and with increasing no. of surgeries time decreased. In first 15 pts mean duration was 111 minutes, in next 16-30 patients it was 86.33 min. and. In rest it was 79 mins.

**Table 9: Mean Blood Loss (ml).**

Author	NDVH (ml)	TAH (ml)
Garg et al <sup>[14]</sup>	286	310
Singh and Bansal <sup>[15]</sup>	47.85	104.58
Present study	98.8	240

**Table 9: In our study Mean blood loss in NDVH was 98.8 ml and in TAH 240 ml. Difference statistically significant, p value <0.0001. Garg et al<sup>[14]</sup>), showed, mean blood loss in NDVH and in TAH was 286 ml and 310 respectively which was not statistically significant. Singh and Bansal<sup>[15]</sup> studies showed statistically significant difference**

Mean preoperative HB In NDVH and TAH groups was 10.64 gms% and 11.44 gms% respectively.

Mean postoperative Hb in NDVH and TAH groups was 10.32 gms % and 9.68 gms% respectively and difference statistically significant p value 0.0061

**Comparison of intraoperative injury:** Present study 4% pts in the TAH GP had bladder injury. These patients had previous LSCS and bladder was adherent. No intra-operative injury in NDVH GP. No intra-operative bowel and ureter injury in both gps. Difference was not statistically significant, p value 0.153, Chi square 2.04 Bharatnur<sup>[16]</sup> showed, 4% bladder injury in TAH and no intraoperative injury in NDVH group.

Taylor et al<sup>[19]</sup> showed, less I/O injuries in NDVH group than TAH group.

**Blood transfusion:** 1 case in NDVH group and 4 in TAH group reqd intraoperative blood transfusion. Difference not statistically significant p value 0.169.

Difference in no. threads used between two groups was statistically significant p value < 0.001 proving NDVH more cost effective than TAH.

No oophorectomy in the NDVH GP, as no indication was there. In TAH group 16 cases underwent bilateral oophorectomy and 6 U/L oopharectomy. Study by Tohic et al<sup>[20]</sup> showed. oophorectomy was less practiced in NDVH.

**Mean Pain score on LACC scale** in NDVH group was 1.28 and in TAH Group 5.75. Difference statistically significant p value <0.0001. Study proved, posoperative comfort was much increased in NDVH Group, most important advantage of NDVH over TAH . Garg et al<sup>[14]</sup> and Deewan et al<sup>[17]</sup> studies also proved it.

**Table 10: Postoperative hospital stay (in days)**

Author	NDVH (Mean hospital stay in days)	TAH (Mean hospital stay in days)
Garg et al <sup>[14]</sup>	1.2	4.3
Singh and Bansal <sup>[25]</sup>	3.54	8.18
Present Study(2013)	3.38	5.89

Table 10: Difference in postoperative stay was statistically significant p value <0.0001.

Stay in NDVH gp was between 3 -7 days with mean 3.38 days as vaginal packs were removed after 24 hrs followed by one day observation. Duration in TAH was between 3-23 days with mean 5.89 day. Patients in TAH group want discharge after stitch removal ( 7<sup>th</sup> and 8<sup>th</sup> p/o day). Due to resuturing, stay was prolonged in 2 patients. Stay significantly decreased in NDVH GP( 1.2 VS 4.3 days) than TAH Group showed by Garg et al<sup>[14]</sup> .

Singh and Bansal<sup>[15]</sup> showed mean stay in NDVH GP was 3.54 days and TAH group 8.18 days Shorter stay was proved in studies by Deewan at al<sup>[17]</sup> and Bharatnur<sup>[16]</sup>

Cather removed after 48 hrs in all cases and in 2 cases > than 48 hrs due to bladder injury.

**Postoperative Complications:**

8% NDVH and 6% TAH patients had UTI. 4% NDVH and 8% TAH patients had vaginal infection. 6% of both NDVHand TAH suffered secondary haemorrhage.

4% of both NDVH and TAH had fever 8% of TAH patients had abdominal wound infection and 4% of them needed resuturing. Difference not statistically significant, Chi square 4.61 and p value 033. Similar conclusion was obtained in study of Bharatnur.

**Summary and Conclusion**

Present study was conducted in OBG Deptt. GMH Patiala to compare NDVH AND TAH with the following aims:

To compare intraoperative and postoperative complications between NDVH and TAH in pts with benign uterine conditions. Total 100 pts( 50 NDVH and 50 TAH )were included and assessed in terms of duration of surgery, blood loss, I/O and P/O complications. Data collected, compiled and statistically compared. (1). No significant difference in age of both groups.(2). Previous LSCS excluded from NDVH GP and 10 cases with previous LSCS underwent TAH (3) 86%( NDVH) had uterine size < or =10 weeks and 14% > 10 weeks. TAH group, 50% had <=10 weeks and 50%> 10 weeks. (4). Bisection, coring, myomectomy and combined methods used in 28% cases of NDVH for easy removal of uterus .(5). Clampless NDVH was done in 20%. (6).42% of TAH group underwent oophorectomy ( Unilateral 14% and bilateral 28% ) No patient had oopharectomy in NDVH Group. (7).Difference in No. of threads used was statistically significant p value < 0.0001. (8). Mean pain score on LACC scale in NDVH GP was 1.28 and in TAH group was 5.75. Difference was statistically significant p value, 0.0001. (9). Difference in postoperative

complications, not statistically significant. (10). Our results were similar to those reported by other studies.

There was statistically significant decrease in duration of surgery, blood loss, no of threads used, postoperative pain and duration of stay in hospital in NDVH Group when compared to TAH Group. But No significant difference in intraoperative injury and post operative complications between two groups.

It is concluded that NDVH is safe, feasible and provides more comfort to pt without increasing duration of surgery, blood loss, intraoperative and postoperative complications but requires experience. It is also concluded that NDVH is more cost effective than TAH as it required less no. of threads and decreased hospital stay.

#### References:

- [1]. Richardson RE, Bournas N, Magos AL Is Laparoscopic hysterectomy a waste of time ? *Lancet*; 1995;345:36-41.
- [2]. Jones HW, III. Abdominal hysterectomy. In: Rock JA, editor; Jones HW III, editor. *Te Linde's Operative Gynaecology 2008*. Philadelphia: Wolters Kluwer Health/ Lippincott Williams and Wilkins; 2008;727-43.
- [3]. McCracken G, Hunter D, Morgan D, Price JH. Comparison of laparoscopic-assisted vaginal hysterectomy, total abdominal hysterectomy and vaginal hysterectomy. *Ulster Med J* 2006;75(1):54-8.
- [4] Hoffman MS, DeCesare S, Kalter C. Abdominal hysterectomy versus transvaginal morcellation for the removal of enlarged uteri. *Am J Obstet Gynecol*. 1994;171(2):309-15
- [5] Lash AF. A method for reducing the size of the uterus in vaginal hysterectomy. *Am J Obstet Gynecol*. 1941; 42:452.
- [6] Sheth SS. The scope of vaginal hysterectomy. *Eur J Obstet Gynecol Reprod Biol* 2004; 115:224-30.
- [7] Ottosen C, Lin gman G, Ottosen L. Three methods of hysterectomy: A randomized prospective study of short term outcome. *BJOG* 2000;107:1380-5.
- [8] American College of Obstetrics and Gynaecology *Precis IV An update in obstetrics and gynaecology*, Washington DC, The College, 1990;197.
- [9]. Das Sharlina, Sheth, Sheth SS, Shirish SS. Surgical Window- A new space in Vaginal hysterectomy to minimize bladder trauma. *J Obstet Gynecol Ind* 2002;53(6):571-5
- [10]. Sheth SS. Guidelines on Hysterectomy. *J Obstet Gynecol Ind* 1998; 48:195-9
- [11]. Kovac SR and Cruikshank SH. Guidelines to determine the route of oophorectomy with hysterectomy. *Am J Obstet Gynecol* 1996 ; 185: 1483-8.
- [12]. Goel N, Rajaram S, Agarwal R, Mehta S. Complications. In: *Step by Step Non-Descent Vaginal Hysterectomy 2<sup>nd</sup> edn*. Jaypee 2010; 166.
- [13] Reich H, DeCaprio J, McGly K: *Laparoscopic Hysterectomy*. *J Gynaecology Surg* 1989;5:213-16 .
- [14]. Garg P, Malhotra N, Deka D. Vaginal approach of hysterectomy in benign conditions of the uterus: At rural health setting. *Obstet and Gynecol* 2003; 8(9): 174-77
- [15] Singh A and Bansal S. Vaginal hysterectomy for nonprolapsed uterus. *J Obstet Gynecol India* 2006; 56 (2): 152-55.
- [16] Bharatnur S. Comparative Study of Abdominal Versus Vaginal Hysterectomy In Non-Descent cases. *The Internet Journal of Gynaecology and Obstetrics* 2011; 15(2).
- [17] Deewan R, Agarwal S, Manisha, Minocha B, Sen SK. Non Descent Vaginal Hysterectomy- An experience. *J Obstet Gynecol Ind* 2004 ;54 (4):367-68.
- [18] Bhadra B, Choudhury AP, Tolasaria A, Nupur N. Non Descent Vaginal Hysterectomy (NDVH): Personal



Experience in 158 cases. Al Ameen J MED Sci 2011 ;

4(1): 23-7.

[19.] Taylor S, Romero A, Qualls C, Rogers R.

Abdominal Hysterectomy for enlarged myomatous uterus compared with vaginal criteria with morcellation.

American Journal of Obstetrics and Gynaecology 1996;

162:994-98.

[20.] Tohic AL, Dhainaut C, Yazbeck C, Hallais C, Levin

I, Madelenat P. Hysterectomy for benign uterine

pathology among women without previous vaginal

delivery. Obstet Gynecol 2008; 111 (4): 829-37.