

Original Research Article


To determine effectiveness of abdominal hysterectomy versus non descent vaginal hysterectomy

P. Divya Daniel¹, D. Anupama^{2*}

¹Obsterician and Gynecologist, ²Assistant Professor

Department of Obstetrics and Gynecology, Modern Government Maternity Hospital, Petlaburj, Hyderabad, Telangana, India

*Corresponding author email: desamalaanupama@gmail.com

	International Archives of Integrated Medicine, Vol. 4, Issue 10, October, 2017. Copy right © 2017, IAIM, All Rights Reserved. Available online at http://iaimjournal.com/ ISSN: 2394-0026 (P) ISSN: 2394-0034 (O)
	Received on: 01-10-2017 Accepted on: 07-10-2017 Source of support: Nil Conflict of interest: None declared.
	How to cite this article: P. Divya Daniel, D. Anupama. To determine effectiveness of abdominal hysterectomy versus non descent vaginal hysterectomy. IAIM, 2017; 4(10): 77-86.

Abstract

Introduction: Hysterectomy is a very common surgery and can be performed by abdominal, vaginal or laparoscopic method though the abdominal route is more popular. Vaginal hysterectomy has distinct health and economic benefits. We designed this study to compare the outcomes in TAH and non-descent vaginal hysterectomy and to determine which route of hysterectomy is superior, safe and effective.

Aims of the study: To determine the safety and effectiveness of abdominal hysterectomy versus non descent vaginal hysterectomy and to compare both in terms of duration of surgery, blood loss, intra operative complications, postoperative complications and duration of hospital stay.

Materials and methods: This was a prospective, study done on total of 100 patients were divided randomly into two groups. One group underwent total abdominal hysterectomy and the other underwent vaginal hysterectomy. Both groups were compared for patient demographics, indications for surgery, size of uterus, duration of surgery, blood loss, need for blood transfusions, complications and duration of hospital stay.

Results: Fibroid was the most common indication in both the groups. Most of the patients had 6 – 8 weeks size uterus. Mean intra operative blood loss in TAH group was slightly more than NDVH group. The need for blood transfusion was similar. The mean duration of surgery was 100.2 minutes in TAH group and 83 minutes in NDVH group. Fever was the most common complication in both groups. Abdominal wound infection and secondary suturing was seen in TAH group. The mean postoperative stay was 8.1 days in TAH group and 5.8 days in NDVH group.

Conclusion: NDVH is associated with less duration of surgery, less blood loss, less postoperative stay than TAH. There was no difference between the need for blood transfusion between the two groups. Therefore, vaginal hysterectomy is safe and feasible in most of the women requiring hysterectomy for benign conditions and should therefore be attempted.

Key words

Total abdominal hysterectomy, Non-descent vaginal hysterectomy, Complications of TAH and NDVH, Duration of TAH and NDVH.

Introduction

Hysterectomy is the most common surgery performed by the gynecologist. It can be performed by abdominal, vaginal or laparoscopic method [1]. Abdominal hysterectomy is the most common procedure performed worldwide with a 70:30 ratio for abdominal versus vaginal method [2, 3]. Despite well-documented evidence that vaginal hysterectomy has distinct health and economic benefits, fewer complications, better post-operative quality-of-life, still most of the gynecologists prefer abdominal hysterectomy [2, 3].

Laparoscopic assisted vaginal hysterectomy (LAVH) is gaining popularity in the present days but is expensive, involves specially trained personnel and risks related to laparoscopy. With increasing concern over health care costs, there is a need for reviewing the feasibility of performing vaginal hysterectomy as a non- laparoscopic method. Vaginal route of hysterectomy is associated with fewer morbidities, lesser hospital stay and better patient satisfaction. We designed this study to focus on women with mobile uteri no larger than 14 weeks pregnant uterine size with benign conditions confined to the uterus and to compare the outcomes in abdominal hysterectomy and non-descent vaginal hysterectomy and to determine which route of hysterectomy is superior, safe and effective.

Aim and objectives

- To determine the safety and effectiveness of abdominal hysterectomy versus non descent vaginal hysterectomy.

- To compare both procedures in terms of duration of surgery, blood loss, intra operative complications, postoperative complications and duration of hospital stay.

Materials and methods

This was a prospective, comparative study carried out in the department of Obstetrics and Gynecology at Modern government maternity hospital, Petlaburj, Hyderabad, Telangana from September 2016 to September 2017.

Inclusion criteria

- Benign non descent cases (dysfunctional uterine bleeding, leiomyoma, cervical polyp, adenomyosis)
- Uterus with good mobility
- Uterine size less than 14 weeks
- Good vaginal accessibility

Exclusion criteria

- Cases of uterine prolapse
- Narrow vagina and rigid perineum
- Uterine size more than 14 weeks
- Uterus with restricted mobility
- History of two or more serial abdominal surgeries or any prior pelvic surgery
- Complex adnexal mass
- Suspected or diagnosed malignancy
- Diabetes mellitus as it may interfere with wound healing
- Preexisting bleeding diathesis.

Informed and written consent was taken from all the patients for pre-operative evaluation, surgical procedure and post-operative follow up. A total

of 100 patients were included in the study who met the inclusion criteria and were divided randomly into two groups:

Group A: 50 patients who underwent abdominal hysterectomy

Group B: 50 patients who underwent vaginal hysterectomy

Demographic and clinical data, preoperative evaluation, sonographic findings, intra-operative observations, and post-op complications were noted.

Estimation of intra operative blood loss was done by assessing the total amount of blood collected in suction bottle after the surgery and by assessing the weight of soaked gauze pads and mops minus dry weight of the gauze pads and mops used during the surgery.

Statistical analysis of the data was done using IBM SPSS 20 software.

Chi-square test was used for finding differences with categorical data such as duration of surgery and post-operative complications. Statistically significant difference was said to be present when p value was less than 0.05, which meant there was difference in the effectiveness and safety of both the routes of hysterectomy. Z test was used to find the statistical differences in the data such as age, between the two groups.

Results

This study was a prospective study comparing the results of total abdominal hysterectomy with non-descent vaginal hysterectomy.

Age wise distribution of cases

Maximum cases in group A, 58% were in the age group of 35-40 years and in group B, 54% were in 41 – 50 years. There were only 2% cases in both groups in 51 -60 years. Mean age in group A was 40.46 years with standard deviation (SD) of 5 and in group B it was 42.74 years and SD was 5.18. There was significant statistical

difference between the two groups with Z value of 2.24.

Parity wise distribution of cases

Mean parity in group A was 2.74 and in group B was 2.68. The difference was statistically significant with p value < 0.001.

In group A maximum parity was para 5 and minimum parity was nulli para whereas in group B it was 5 and primipara respectively.

The difference between the two groups was not statistically significant with p value >0.05. Most common indication for both groups was fibroid uterus (**Table – 1**).

In group A, normal size uterus was seen in 8 (16%) cases, 6-8 weeks size in 30 (60%) cases and >8 to 14 weeks in 12 (24%) cases. In group B the corresponding number of cases were 20 (40%), 26 (52%) and 4(8%) respectively. The Chi square value was 9.42 and degree of freedom was 2. Most of the cases in group A and group B were of 6-8 weeks uterine size. The difference between the two groups was statistically significant with p <0.01 (**Figure – 1**).

Intra operative blood loss

Mean blood loss in group A was 301.3ml and in group B it was 227.5 ml. The Chi square test value was 19.441. Degree of freedom was 2. The blood loss between the groups was statistically significant with p < 0.001.

In group A, intra operative 1 (2%) cases and post-operative 9 (18%) cases received transfusions whereas, in group B, intra operative 2 (4%) cases and post-operative 9 (18%) cases received transfusion. The difference in the two groups was not statistically significant (p value = 0.1) as per **Figure - 2**.

The operative time between the two groups was statistically significant (p value = 0.000008) as per **Table – 2**.

Table – 1: Indications for surgery.

Indication	Group A –TAH N=50	Group B NDVH N=50	Chi square value	Degree of freedom
DUB	14 (28%)	18 (36%)	1.12	2
Fibroid	24 (48%)	19 (38%)		
Others (HSIL/ LSIL, Cervical fibroid polyp, Adenomyosis)	12 (24%)	13 (26%)		
Total	50 (100%)	50 (100%)		

Table – 2: Duration of surgery.

Time in minutes	Group – A N=50	Group – B N=50	Chi square test value	Degree of freedom
30-60	3 (6%)	5 (10%)	23.351	2
60-90	18 (36%)	39 (78%)		
91-120	29 (58%)	6 (12%)		
Total	50 (100%)	50 (100%)		

Table – 3: Post-operative hospital stay.

Duration of hospital stay (Days)	Group A N=50	Group B N=50	Chi square test value	Degree of freedom
Up to 5 days	5 (10%)	21(42%)	19.600	4
6 – 9 days	34 (68%)	29 (58%)		
10-13 days	9(18%)	--		
14 -18 days	1(2%)	--		
>18 days	1(2%)	--		
Total	50(100%)	50(100%)		

Figure - 1: Distribution of cases in TAH and NDVH groups based on uterine size.

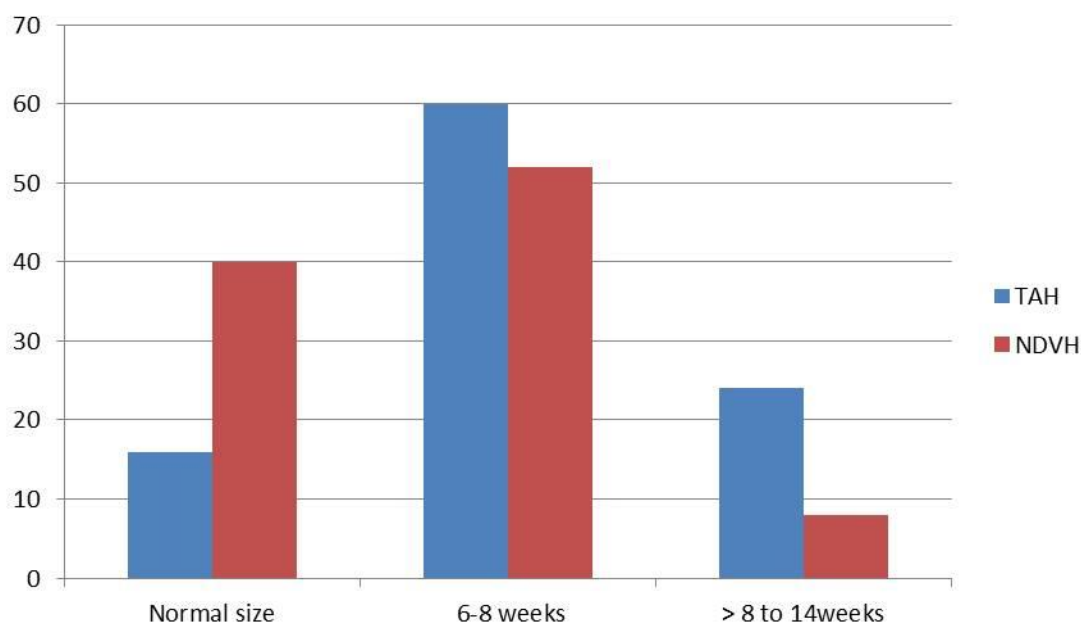
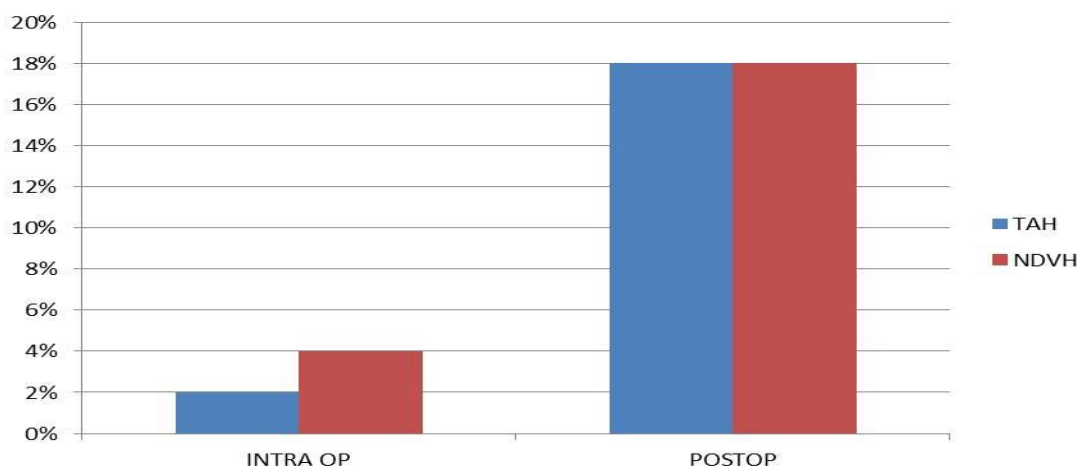


Figure - 2: Distribution of cases based on need for blood transfusion.



Complications

There were no intra operative complications such as bowel injury, bladder injury or ureteric injury in both the groups. In postoperative period most common complication was fever in both the groups, 11 (22%) cases in group A and 7 (14%) cases in group B had fever. The difference in fever between the two groups was not statistically significant with p value >0.05. In addition, group A also had abdominal wound infection in 3 (6%) cases and 2 (4%) cases required secondary suturing.

Overall post-operative complications

In group A, overall 12 (24%) cases had complications whereas, in group B, only 7 (14%) had complications. The Chi square test value was 1.624 and degree of freedom was 1. The difference in post-operative complications was not significant (p value =0.2).

Mean duration of post-operative hospital stay in group A and group B was 8.1 days and 5.8 days respectively. The post-operative stay between the two groups was statistically significant (p value = 0.0005) as per **Table – 3**.

Discussion

In the absence of uterine prolapse, most of the gynecologists prefer the abdominal route rather than the vaginal route for performing hysterectomy. But with adequate vaginal access and good uterine mobility and good technical

skill, vaginal hysterectomy can be easily performed. Advantages of NDVH over abdominal hysterectomy are; there is no scar, adhesions, hernia or wound gaping. It takes less operative time, with decreased blood loss, minimal anesthetic complications and largely extra peritoneal dissection to prevent injury to bowel, bladder and ureter, no paralytic ileus, shorter hospital stay, faster recovery, with low cost and less thromboembolic phenomena, ultimately resulting in less mortality and morbidity. It also forms a natural, simple route for drainage. Non-descent vaginal hysterectomy offers a cost effective alternative to laparoscopic hysterectomy especially in developing countries.

Age distribution

In the present study, mean age of 40.4 years in group A and 42.7 years in group B is comparable to the study of Garg, et al. [4] who reported a mean age of 43 years in group A and 41 years in group B. Taylor, et al. [5] observed mean age of 42.2 and 43.4 years in group A and group B respectively. Kovac, et al. [3] observed a mean age of 47.2 and 43.1 years in group A and group B respectively which is comparable to our findings. The maximum age in group A and B was 56 and 55 years respectively. The overall mean age for hysterectomy was 41.6 years.

Parity

The mean parity was 2.5 in group A and 3.2 in group B in our study which is comparable to the

study by Kovac, et al. [6] who reported it as 2.5 for group A and 2.7 for group B and also to the study by Dewan, et al. [7] where it was 2.5 and 3.2. In our study, 50% cases were para 2 followed by para 3 (28%) in group A. In group B, highest number of cases were para 3 (48%), which was a favorable factor for vaginal hysterectomy.

The maximum cases in NDVH group (94%) were multiparous. Multiparity gives laxity to tissues enabling easy surgery despite enlarged uterus. In a study by Chakraborty, et al. [8] all the cases were para 2 and above. Chandana, et al. [9] reported that 85% of cases were para 2 and above. Our study was comparable to Bhadra, et al. [10] in which 94.4% of cases were para 2 and above. In a study by Ray, et al. [11] 53.2% of cases were para 3 and above in NDVH group which was comparable to the present study where 60% of the cases were para 3 and above.

Transvaginal accessibility of the uterus is an important factor for VH. Inadequate accessibility due to narrow vagina (<2 finger breadths) or an undescended immobile uterus make VH impossible [12].

Indication for surgery

Determining whether the pathology is confined to or extended beyond the confines of the uterus is critical in selecting the most appropriate route for hysterectomy. Severe endometriosis, adnexal pathology, adhesions etc., contraindicate vaginal hysterectomy. Cases of endometriosis and pelvic inflammatory disease (PID), complex adnexal and gynecologic malignancies were excluded as they restrict mobility or require radical hysterectomy with lymph node exploration.

The most common indication for surgery in both groups was fibroid uterus which was 48% and 38% in group A and B respectively. This was comparable to the study by Chakraborty, et al. [8] in which fibroid uterus was the most common indication in 45% cases in group A and 32% in group B and DUB which was the second common indication with 28% in group A and 45% in group B. In a study by Bhadra, et al. [10]

fibroid uterus was the most common indication for both groups. There were only few cases of Adenomyosis in the present study which was not comparable to the other studies.

The other indications for TAH in the present study were DUB 28%, HSIL/ LSIL 14% and cervical fibroid/polyp 10% cases. In NDVH group, the indications were DUB 36%, HSIL/ LSIL 22%, cervical fibroid polyp 2% and adenomyosis 2%. Fibroid and DUB were the most common indications for hysterectomy in the studies by Garg, et al. [4] and Singh, et al. [13]. The results of the present study were comparable to the study by other authors [7, 8, 12].

Based on size of the uterus in gestational weeks

Size of the uterus influences the route of hysterectomy. The lower proportion of vaginal hysterectomies was due to uterine enlargement with leiomyomas or adenomyosis. However, bulky uteri can be dealt with techniques like bisection, myomectomy or debulking. In the present study, majority of the patients (84%) had uterine size less than 12 weeks which was similar to the study by Bhadra, et al. [10] (89.8%). In both the groups, maximum number of cases had uterine size of 6 – 8 weeks, followed by normal size uterus.

Majority of cases which underwent NDVH were less than 12 weeks as shown in the study by Reiter, et al. [14] and Chandana, et al. [9]. In our study, 98% cases had < 12 weeks uterine size which was comparable to the findings of Chandana, et al. [9] who observed it as 84% in their study. Kumar and Antony [15] successfully carried out vaginal hysterectomies up to 12 weeks size uterus.

Duration of surgery

In the present study, the mean duration of surgery was 100.2 and 83 minutes in group A and group B respectively. This time difference was significant with p value <0.05. Shantini, et al. [16] observed mean duration of 99.2 minutes

in group A and 79.6 minutes in group B (p -value <0.001). Garg, et al. [4] observed mean duration of surgery for TAH as 92 minutes and for NDVH as 41 minutes. Dorsey, et al. [17] observed that TAH took 30 minutes longer than VH. Similarly EVALUATE trial [18] showed that average duration of hysterectomy in abdominal group was 50 minutes, vaginal group was 39 minutes and laparoscopic hysterectomy was 84 minutes. Chakraborty, et al. [8] reported a mean of 48 minutes in group A and 42 minutes in group B which was not comparable to the present study.

The majority of cases in our study in group A (58%) required a duration of 90 to 120 minutes. TAH took longer time than NDVH because most of them were done by junior staff under the guidance of senior staff.

Comparison of operating time (in minutes) for NDVH group

In our study, the mean duration of surgery in NDVH group was 83 minutes with a range of 30 – 120 minutes as compared to Magos, et al. [19] where it was 84.3 minutes with a range of 30 - 150 minutes and Ray, et al. [11] where it was 62.6 minutes and range was 20 -100 minutes. Goel, et al. [20] and Dewan, et al. [7] reported mean operating time of 64 and 54.5 minutes respectively. The operative time depends on the experience of the surgeon, and need for morcellation.

Based on blood loss during surgery

In the present study, the difference in the mean blood loss between the two groups was significant with p value < 0.05 . The mean blood loss in group A was 301.3 ml and 227.5 ml in group B, which was comparable to the study by Garg, et al. [4] where it was 310 ml in group A and 286 ml in group B. Ray, et al. [11] also observed similar findings. Singh, et al. [13] reported a mean blood loss of 104.58 ml in TAH group and 47.85 ml in NDVH group which was statistically significant. Shantini, et al. [16] and Ray, et al. [11] also reported similar observations.

In NDVH group, mean blood loss was 227.5 ml and this amount was dependent on uterine size and duration of surgery. Various authors have reported mean blood loss of 150 +/- 65 ml, 100 ml and 290 ml [7, 9, 10].

Based on the need for blood transfusion

In the present study, there was no significant difference in the need for blood transfusion between the two groups (p value= 0.1). In the majority of cases the need for blood transfusion was based on intra operative blood loss which was in turn dependent on the duration of surgery and uterine size and also the skill of the surgeon to some extent.

The need for blood transfusion was 20% in group A and 22% in group B. In a study by Chakraborty, et al. [8] the need for blood transfusion was 5% in group A and 1% in group B. In NDVH group, the need for blood transfusion was 10% and 4% respectively as reported by Chandana, et al. [9] were not comparable to the present study. As most of our cases were of fibroid uterus, the need for blood transfusion was more due to increased vascularity of the uterus and of fibroid.

Complications

In the present study, the most common complication among both the groups was fever. In group A (22%), one patient had fever with wound infection and the other had fever, wound infection and also underwent secondary suturing of the wound.

Garg, et al. [4] reported more febrile morbidity in TAH group (17.6%) compared to NDVH group (11.5%) similar to our findings. Kovac, et al. [21] reported 4% and 0.8% febrile morbidity in group A and B respectively. In the present study, in group A, 3 patients (6%) had abdominal wound infection, out of which 2 cases (4%) had fever. Only 2 patients (4%) who had abdominal wound infection needed secondary suturing of the wound. Chakraborty, et al. [8] and Shantini, et al. [16] reported a wound infection rate of 5% and 5.7% respectively in TAH group which

compared well with our findings. Ray, et al. [11] reported abdominal wound infection rate of 2.5%.

Intra operatively, none of the cases had bladder injury and bowel injury in the present study. Bladder injury was higher in vaginal hysterectomy group than abdominal hysterectomy group in the study done by Dicker, et al. [22]. Study by Taylor, et al. [5] showed bowel, bladder and ureteric injury higher in the abdominal hysterectomy group.

In NDVH group of the present study, except for fever (14% of patients) there were no major postoperative complications. Chandana, et al. [9] reported 11% postoperative febrile morbidity in NDVH group which was comparable to the present study. Dewan, et al. [7] also reported few minor complications (14%) in postoperative NDVH group. Similarly, Ray, et al. [11] showed

reduced infection and hemorrhage in vaginal hysterectomy compared to abdominal hysterectomy. None of the cases required conversion to total abdominal hysterectomy in the present study. Chandana, et al. [8] reported 3% conversion rate to abdominal hysterectomy.

Comparing the overall post-operative complication rate, group A had 24% cases and group B had 14% cases. The difference in the groups was not statistically significant. Kovac, et al. [21] reported higher risk of complications in TAH (9.3%) than in LAVH (3.6%) or vaginal hysterectomies (5.3%).

Duration of postoperative hospital stay (in days)

The postoperative period between the two groups was statistically significant with p value <0.05 (**Table – 4**).

Table – 4: Duration of postoperative stay (in days).

Study done by	Group A –TAH	Group B – NDVH
Ray, et al. [11]	6.9	3.5
Taylor, et al. [5]	3.9	2.6
Singh, et al. [13]	8.18	3.5
Chakraborty, et al. [8]	4.5	3.5
Dorsey, et al. [17]	4.5	3.5
Present study	8.1	5.8

Most of the cases of NDVH had mean duration of postoperative stay around 3 days. The shorter duration of postoperative stay was proved beyond doubt by various authors [7, 9, 11].

Though most of the patients of NDVH and TAH group were fit for discharge on 3rd and 4th post-operative day respectively, they were discharged at a mean of 5.8 and 8.1 days respectively. The reasons for delayed discharge were lack of proper hygienic conditions at their homes, provision of free food during hospital stay and long distance from hospital making follow up difficult as most of the patients were from rural areas.

This study was focused on a small segment of hysterectomies rather than assessing the decision making and outcome for all hysterectomies. Further larger studies are recommended.

Conclusion

From the above study it was concluded that, NDVH is associated with less duration of surgery, less blood loss, less postoperative stay than TAH. There was no difference between the postoperative complications and need for blood transfusion between the two groups. Vaginal hysterectomy is safe, feasible and patient friendly in most of the women requiring hysterectomy for benign conditions and should therefore be

attempted. The short term clinical outcome in NDVH is superior to TAH.

References

1. Howard W, Jones S. In: Sonya Seigafuse, Ryan Shaw, Nicole Dernoski, Mark Flanders, Rosanne Hallowell editorial team. Te Linde's Operative Gynecology, 10th edition, New Delhi: Woltres Kluwer India Pvt Ltd., 2013, p. 727-41.
2. Nieboer TE, Johnson N, Lethaby A, Tavender E, Garry R. Surgical approach to hysterectomy for benign gynecological disease. Cochrane database Syst Reviews, 2009; 3: CD003677.
3. Kovac SR. Guidelines to determine the route of hysterectomy. *Obstet Gynecol.*, 1995; 85: 18-23.
4. Garg PK, Deka D, Malhotra N. Non-descent vaginal hysterectomy for benign condition. A better proposition than abdominal hysterectomy. *Journal of Obs and Gynae Today*, 2002; 6: 345-346.
5. Taylor SM, Romero AA, Kammerer-Doak DN, Qualls C, Rogers RG. Abdominal hysterectomy for the enlarged myomatous uterus compared with vaginal hysterectomy with morcellation. *Am J Obstet Gynecol.*, 2003; 189: 1579-1583.
6. Kovac SR, Barhan S, Lister M, Tucker L, Bishop M, Das A. Guidelines for the selection of the route of hysterectomy – Applications in a resident clinic population. *Am J Obstet Gynecol.*, 2002; 187: 1521-527.
7. Dewan R, Agarwal S, Manisha, Minocha B, Sen SK. Non descent vaginal hysterectomy - An Experience. *J Obstet Gynecol Ind.*, 2004; 54: 376-78.
8. Chakraborty S, Goswami S, Mukherjee P, Sau M. Hysterectomy.....Which Route? *The Journal of Obstetrics and Gynecology of Ind.*, 2011; 61: 554-57.
9. Chandana C, Venkatesh S, Shah TN. Non-Descent Vaginal Hysterectomy for Benign Gynecological Disease – A Prospective Study. *Journal of Evidence Based Medicine and Healthcare*, 2014; 1: 827-33.
10. Bhadra B, Choudhury AP, Tolasaria A, Nandi N. Non Descent Vaginal Hysterectomy (NDVH): Personal Experience in 158 Cases. *Al Ameen J Med Sci.*, 2011; 4: 23-27.
11. Ray A, Pant L, Balsara R, Chaudhury R. Non Descent Vaginal Hysterectomy: A Constantly Improving Surgical Art. *The Journal of Obstetrics and Gynecology of India*, 2011; 61: 182 – 88.
12. Doucette RC, Sharp HT, Alder SC. Challenging generally accepted contraindications to vaginal hysterectomy. *Am. J. Obstet. Gynecol.*, 2001; 184: 1386-91.
13. Singh A, Bansal S. Vaginal hysterectomy for non-prolapsed uterus. *J Obstet Gynecol India*, 2006; 56: 152-155.
14. Reiter RC, Wagner PL, Gambone JC. Routine hysterectomy for large asymptomatic uterine leiomyomata – A reappraisal. *Obstet. Gynecol.*, 1992; 79: 481-84.
15. Kumar S, Antony ZK. Vaginal hysterectomy for benign non-prolapsed uterus – Initial experience. *J Obstet. Gynecol Ind.*, 2004; 54: 60-63.
16. Shanthini NF, Poomalar GK, Jayasree M, Bupathy A. Evaluation of complications of abdominal and vaginal hysterectomy. *Int J Reprod Contracept Obstet Gynecol.*, 2012; 1: 7-11.
17. Dorsey JH, Steinberg EP, Holtz PM. Clinical indications for hysterectomy route: patient characteristics or physician preference. *Am J Obstet Gynecol.*, 1995; 173: 1452-60.
18. Garry R, Fountain J, Mason S, Hawe J, Napp V, Abbott J, et al. The evaluate study: two parallel randomised trials, one comparing laparoscopic with abdominal

- hysterectomy, the other comparing laparoscopic with vaginal hysterectomy. *BMJ*, 2004; 28: 328-494.
19. Mogas A, Bournas N, Sinha R, Richardson RE, O' Connor H. Vaginal hysterectomy for the large uterus. *Br. J. Obstet. Gynecol.*, 1996; 103: 246-51.
 20. Goel N, Rajaram S, Ghumman S. Chapter 12 - Analysis of data: 75 consecutive cases. In: *Step by step non-descent vaginal hysterectomy*, 1st edition, Delhi: Jaypee publishers; 2005, p. 138-46.
 21. Kovac SR. Hysterectomy outcome in patients with similar indications. *Obstet Gynecol.*, 2000; 95: 787-93.
 22. Dicker RC, Scally MJ, Greenspan JR, Layde PM, Ory HW, Maze JM, et al. Hysterectomy among women of reproductive age: Trends in the United States, 1970-1978. *JAMA*, 1982; 248: 323-27.