COMPARISON OF VAGINAL AND ABDOMINAL HYSTERECTOMY: PERI- AND POST-OPERATIVE OUTCOME

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Background: Abdominal and vaginal hysterectomies are the two predominant operative modalities for various uterine conditions; however the indications for selecting a particular procedure in any setting may not be optimally defined. This study was undertaken to evaluate the appropriate route of hysterectomy (abdominal or vaginal) in a hospital population for women with benign disease by comparing peri-operative and post-operative complications. **Methodology:** This quasi-experimental study was undertaken at the Department of Obstetrics and Gynaecology, Fauji Foundation Hospital/Foundation University Medical College, Rawalpindi from January to December 2007. Eighty subjects were equally divided into vaginal and abdominal hysterectomy groups by convenience (non-probability) sampling. The primary outcome measures were operative time, primary haemorrhage, wound infection, post-operative analgesia, febrile morbidity, hospital stay and secondary haemorrhage; secondary outcome measure were estimated cost, re-admission and reopening. **Results:** There were no differences in the patients' mean age, parity, body mass index, and preoperative haemoglobin levels between groups. Vaginal hysterectomy was associated with less febrile morbidity, wound infection operative time, economic cost, bleeding requiring transfusion and re-admission than abdominal hysterectomy. Main indication for women having abdominal operation was leiomyomas, whereas more women having uterovaginal prolapse had vaginal hysterectomy. **Conclusion:** Patients requiring a hysterectomy for benign lesions having a moderate-sized uterus can be offered vaginal route for surgery.

Keywords: Hysterectomy, Abdominal hysterectomy, vaginal hysterectomy, indications, post-operative outcome, post-operative complications

INTRODUCTION

Hysterectomy is surgical removal of all or part of uterus. The first abdominal hysterectomy was performed by Charles Clay in Manchester in 1843. Vaginal hysterectomy dates back to ancient times. The procedure was performed by Soranus of Ephesus in 120 AD. Advances in anaesthesia, transfusion services, surgical techniques and availability of antibiotics led to hysterectomy becoming the most common non-pregnancy related major surgical procedure in women. A total of 575,000 hysterectomies were done in year 2005 in US.[1] Nine out of every ten hysterectomies are performed for non-malignant diseases.[2] Currently there are three main types of hysterectomy operations in practice for benign diseases–abdominal hysterectomy (AH), vaginal hysterectomy (VH) and laparoscopic hysterectomy (LH). AH remains the predominant method of uterine removal. This route is used for malignancies, bulky uteri or when there are adhesions and removal of uterus is not possible through VH. Currently it exceeds VH by a ratio of 1:1 to 6:1 across North America[3] VH was initially only used for prolapse, but its indications are now increasing. VH is accepted as less invasive than AH and there are reports of its preferential use as it has many advantages over AH.[4–6] LH requires greater surgical skills and takes longer than the other two routes. There is greater danger of bladder or ureteric injury. Indications, of hysterectomy include Leiomyomas, endometriosis, uterovaginal (UV) prolapse (pelvic relaxation), pelvic inflammatory disease (PID), endometrial hyperplasia, dysfunctional/abnormal uterine bleeding (DUB), menorrhagia, dysmenorrhoea or pelvic pain associated with significant pelvic disease, intractable postpartum haemorrhage, ruptured tubo-ovarian abscesses, endometrial hyperplasia with atypia and malignancies such as cervical intraepithelial neoplasia or invasive Disease.[7,8] Surgical technique for vaginal myomectomy has now been described by posterior[9] as well as anterior route,[10] even for fibroids weighing up to 1,600 g.[11] For DUB, hysterectomy is last treatment option for women who have completed childbearing, do not tolerate medical treatment or have atypical endometrial hyperplasia.[12] The selection of cases for VH or AH depends upon many clinical variables singly or in combination. These include pelvic anatomy, uterine size, adnexal disease, gastrointestinal complaints, urological disorders, (cystocele/prolapse of the urethrovesical angle, rectocoele, enterocoele), heart or lung disease, body mass index, parity, previous tubal ligation or caesarean section.[13] Hysterectomy is a reasonably safe, common, and routine surgical procedure which rarely leads to peri-operative death.[2] Overall mortality rates for AH or VH are 0.1–0.2%.[14] It is not associated with long-term risk of death.[2] Minor complications, including postoperative infection, fever, wound haematoma, or separation, occur in about 25% of patients, and major complications, including blood transfusion and injury

to bowel, bladder, or ureter, occur in 5% to 14% of patients.[15] The most serious postoperative complication is haemorrhage (0.2–2%).[16] About 10% patients are expected to have postoperative febrile morbidity and infection.[8] The bladder may be injured in 2.9% of all hysterectomies. Ureteral injury occurs in 0.7–1.8% of AH and 0–0.1% of VH.[17] Damage to the bowel is quite uncommon, particularly with VH.[18] About 80% injuries occur at the junction of ureter and uterine artery.[19] Younger women undergoing hysterectomy for symptomatic fibroids (especially LAVH) are at most risk of experiencing severe operative and post-operative complications.[20] Women might be at higher risk of depression, anxiety and psychosexual problems following hysterectomy.[21] This study was undertaken to evaluate the appropriate route of hysterectomy (abdominal or vaginal) in our hospital population for women with benign disease by comparing peri-operative and post-operative complications.

MATERIAL AND METHODS

It was a quasi-experimental study done at Fauji Foundation Hospital Rawalpindi, a tertiary care, teaching hospital during one year period (Jan 2007–Dec 2007). Patients were selected from OPD, by taking detailed medical history, general physical and systemic examination. The confounding variables were controlled by strictly following the inclusion and exclusion criteria. A total of 80 subjects were evenly divided into VH and AH groups. Sampling was convenience (non-probability). Subjects having uterus of less than 14 weeks size and requiring hysterectomy for benign pathology, UV-prolapse or those with failed medical treatment in dysfunctional uterine bleeding (DUB) were included. Subjects with morbid obesity (BMI>30), pelvic malignancy, cardiac diseases, bronchial asthma, hypertension, pelvic inflammatory disease, endometriosis, or those whose route of hysterectomy was converted to AH from VH were excluded from the study. Informed, written consent was taken from them by explaining risks and benefits associated with the procedure. Approval of ethical committee was also taken. All hysterectomies were performed by Consultants. Peri-operative outcome were measured in terms of operative time in minutes, bladder or ureteric injury and primary haemorrhage. Post-operative outcome were measured in terms of wound infection, urinary tract infection, post-operative analgesia, post-operative recovery time, pyrexia, hospital stay in days, secondary haemorrhage, estimated cost, re-admission, re-opening and mortality. The length of the operative time in minutes was recorded from the first surgical incision to the time at which all wounds were closed and dressed. Blood loss was estimated by measurement of aspirated blood and weighing of swabs. All the patients were prescribed an identical regimen of post-operative analgesia. Every patient had haemoglobin estimation pre-operatively and on the second post-operative day. Post-operative temperatures were recorded 4 hourly and any patient having temperature more than 37.5 °C were investigated. The length of the time (days) from the morning of the first post-operative day up to and including the day of the discharge was recorded. Apyrexial, fully ambulated patient requiring no further analgesia were considered fit for discharge. Data was recorded and entered in SPSS version 12. Means and SDs were calculated for operating time (minutes), estimated blood loss (ml), drop in haemoglobin (mg/dl), length of hospital stay (days), and estimated cost (Rupees). Student's *t*-test was used to compare numerical variables between two groups. Frequency (%) was calculated for peri- and post-operative complications. 'Chi-square' test was used for comparing descriptive variables. A p value of <0.05 was taken as statistically significant.

RESULTS

Out of 80 hysterectomies 50 (62.5%) were performed for uterine leiomyomas, 23 (38.7%) for UV- prolapse and only 7 (8.8%) for DUB. Breakdown of indications according to type of hysterectomy (AH vs VH) have been given in Table-1. Table-2 outlines frequency of peri-operative events including blood loss, mean fall in haemoglobin level and comparison of length of hospital stay and cost. There was no significant difference in patient characteristics between the two groups. Table-3 shows postoperative complications. There was no mortality, nor post-operative paralytic ileus, ureteric or bladder injury occurred in any patient. Significantly more parentral analgesic doses of diclofinac were needed post-operatively in AH group (3.20±1.13) than in VH group (2.25±0.439, $p<0.05$). None of our patients in VH group had wound infection while 6 (15%) patients of AH group developed wound infection. ($p=0.026$).

Table-1. Indications of hysterectomy (n=80)

Indications	VH n (%)	AH n (%)	Total n (%)
Leiomyoma	16 (40.0)	34 (85.0)	50 (62.5)
Uterovaginal prolapse	19 (47.5)	4 (10.0)	23 (28.7)
Dysfunctional uterine bleeding	5 (12.5)	2 (5.0)	7 (8.8)

Table-2. Comparison of patient characteristics, peri- and post-operative events (*n*=80)

Variable	Mean±SD		Difference	*p*-value
	VH (*n*=40)	AH (*n*=40)		
Age (years)	53±7.9	51±4.76	2	NS
Weight (kg)	60.50±6.28	67.93±6.44	7.43	NS
Height (cm)	155.82±6.40	161.22±3.02	5.4	NS
BMI	24.65±2.43	25.80±2.64	1.15	NS
Parity	3.34±1.47	3.57±1.56	0.23	NS
Preoperative haemoglobin (g/dl)	12.36±1.00	11.73±1.20	0.63	NS
Duration of operation (min)	73.20±20.35	85.88±19.44	12.68	0.005
Blood loss (ml)	291.50±201.387	368.75±135.25	77.25	0.047
Drop in Haemoglobin	0.87±0.93	1.05±0.58	0.18	0.30
*Hospital stay (days)	2.03±0.15	3.30±0.72	1.27	<0.05
*Total cost (Rs)	10053±392	10265±286	212	0.007

Table-3: Post-operative complications

Variable	VH (*n*=40)	AH (*n*=40)	*p*-value
Pyrexia	-	2 (5.0%)	-
Secondary haemorrhage	2 (5%)	5 (12.5%)	0.61
Wound infection	-	6 (15%)	-
Bleeding requiring transfusion	1 (2.5%)	3 (7.5%)	0.432
Re-admission	1 (2.5%)	9 (22.5%)	0.014
Re-opening	-	2 (5%)	-

DISCUSSION

In the beginning, there were no comparative studies between AH and VH; the two established routes, because most gynaecologists regarded the clinical indications for each procedure to be different. Since the introduction of laparoscopic technique the optimal route for hysterectomy has been the subject of extensive discussion. Recently, a meta-analysis of 27 trials has been reported to evaluate the most appropriate surgical approach to hysterectomy. Present study was carried out in this background to evaluate the local conditions and to re-enforce the scientific evidence in this regard. Results of indications (Table-1) show that 85% of the AH were for leiomyomas similar to reported by Ikram *et al*[22] and 15% for UV-prolapse/DUB in contrast to only 39% AH for fibroids, 26% for DUB and only 3% for UV-prolapse by Saha *et al*.[8] Similarly all their VH were for prolapse while 66.6% of VH by Ikram et al[22] and 60% by Iftikhar[23] were for UV-prolapse, in contrast to our study where half of the VH were done for causes other than UV-prolapse. More AH are being performed for fibroids (40–85%) and more VH for UV-prolapse (10–66.7%), although the proportions vary widely.[6,8] The notable differences between our and other similar studies may have occurred because of different inclusion/exclusion criteria or varying parameters to assign the type of procedure to each patient. At present the route of hysterectomy is mostly dependent upon institutional trends, personal preference, experience and expertise of the operator with different approaches. Only a small number of surgeons are equally competent in performing hysterectomy by all routes, and most are comfortable with one route only, being trained better in VH or AH. So there is a need to impart sufficient training in abdominal as well as vaginal surgery to younger generations, although teaching hysterectomies take a bit longer to perform, but it does not have greater adverse outcomes.[24] There are a host of patient characteristics such as uterine size and descent, extra-uterine pelvic pathology, prior pelvic surgery, body mass index, parity, need for oophorectomy, removal of cervix which are important in such decision making.[13] It may also be an evidence of implementation of various guidelines proposing changing practices and expanding the list of indications of VH.[7,25] There is a need to have consensus over various formulated clinical guidelines for selecting the most suitable route.[26]

In our study VH was the faster operating technique than AH, resulted in shorter hospital stay and was associated with less peri- and post-operative morbidity as has been reported by others[27,28] There was no wound infection in VH and it was associated with less febrile morbidity, bleeding requiring transfusion and re-admission. Our results are in accordance with many local and international studies.[6,23,25] No patient suffered any visceral injury during the procedure, whereas injuries to ureter, bladder and intestine have been reported in other studies.[14,17,29] This may be because all hysterectomies were performed by well trained and experienced consultant gynaecologists. Only 5% (2/40) patients of AH developed pyrexia against none in VH group in our study, although higher rates of febrile morbidity for both AH and VH have been reported in local studies from Lahore (42.8% and 20%)[22] and (20% and 10%),[30] Karachi (9.67% and 9.61%),[23] and Peshawar (30.1% and 19.2%)[6] respectively. This difference probably was due to appropriate prophylactic use of antibiotics before the start of operation in our study.[13,31] These studies further substantiate that VH is associated with less infection as

compared with AH. Having no mortality in our cases is consistent with some reports,[22,32,33] although mortality rates ranging from 0.25% to 1.5% have been stated in some studies.[20,29,30,34] Short hospital stay was possible due to start of early feeding[35] and early mobilisation of our patients after surgery. A shorter length of stay is a desirable outcome for both the patient and the hospital. Many factors contributed towards lower hospital costs in VH. Shorter operation time, shorter hospital stay, reduced quantity of antibiotics usage and lesser quantity of consumable use in VH compared to AH are among the few. AH required the use of costly, non-absorbable Prolene® suture and relatively more use of absorbable Vicryl® 2/0 interrupted sutures. A recent study found that the cost of AH and LAVH were 34.5% and 72% higher than for VH, respectively. Hysterectomy being a common gynaecologic operation, any potential savings associated with it would have a remarkable effect on the overall cost. Moreover, significant reductions in health care costs could be possible if the VH (natural orifice, minimally invasive option) predominates together with earlier hospital discharge, quicker recovery, better postoperative quality of life (functional capacity, physical aspect and pain) and higher rate of patient satisfaction.[5,11,28] The risk of serious peri-operative or short-term and long-term complications is low, therefore, the studies to compare surgical approaches require to be done on large series of cases which is not only difficult to organise but is expensive also. The data on outcome measures, such as pelvic pain, bowel dysfunction, and vaginal prolapse is scanty than less important outcome measures such as duration of operation and blood loss.[2] Larger and more robust studies are therefore, required to consider those outcomes which are more important to patients such as quality of life, sexual function, pelvic pain, bowel and urinary function and vaginal prolapse.

CONCLUSION

Present study further supports the view that all patients requiring a hysterectomy for benign conditions with a moderate-sized uterus can be offered VH because of its obvious advantages.

REFERENCES

1. DeFrances CJ, Hall MJ. 2005 National Hospital Discharge Survey. Adv Data. 2007;(385):1–19.
2. Edozien LC. Hysterectomy for benign conditions. BMJ 2005;330(7506):1457–8.
3. Kovac SR. Transvaginal hysterectomy: rationale and surgical approach. Obstet Gynecol 2004;103:1321–5.
4. Spilsbury K, Hammond I, Bulsara M, Semmens JB. Morbidity outcomes of 78,577 hysterectomies for benign reasons over 23 years. BJOG 2008;115:1473–83.
5. Silva-Filho AL, Werneck RA, de Magalhães RS, Belo AV, Triginelli SA. Abdominal vs vaginal hysterectomy: a comparative study of the postoperative quality of life and satisfaction. Arch Gynecol Obstet. 2006;274:21–4.
6. Shahida A. Short and long term complications of Abdominal and Vaginal Hysterectomy for benign disease. Pak Armed Forces Med J 2004;54(1):71–5.
7. Merrill RM. Hysterectomy surveillance in the United States, 1997 through 2005. Med Sci Monit 2008;14(1):CR24-CR31.
8. Saha R, Sharma M, Padhye S, Karki U, Pandey S, Thapa J. Hysterectomy: an analysis of perioperative and post operative complication. Kathmandu Univ Med J 2003;1:124–7.
9. Milovanović Z, Stanojević D. [Myomectomy via the vagina]. Srp Arh Celok Lek 2004;132(1–2):18–21.
10. Carminati R, Ragusa A, Giannice R, Pantano F. Anterior and posterior vaginal myomectomy: a new surgical technique. Med Gen Med 2006;8(1):42.
11. Mistrangelo E, Febo G, Ferrero B, Ferrero S, Deltetto F, Camanni M. Safety and efficacy of vaginal hysterectomy in the large uterus with the LigaSure bipolar diathermy system. Am J Obstet Gynecol 2008;199:475.e1–5.
12. Farrell E. Dysfunctional uterine bleeding. Aust Fam Physician 2004;33:906–8.
13. Leung KY. Changing pattern of hysterectomies for benign conditions. Hong Kong Med J 2007;13(3):176–7.
14. Harris WJ Early complications of abdominal and vaginal hysterectomy. Obstet Gynecol Surv 1995;50:795–805.
15. Dutton S, Hirst A, McPherson K, Nicholson T, Maresh MA. UK multicentre retrospective cohort study comparing hysterectomy and uterine artery embolisation for the treatment of symptomatic uterine fibroids (HOPEFUL Study): main results on medium-term safety and efficacy. BJOG 2007;114(11):1340–51.
16. 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.
17. Wu HH, Yang PY, Yeh GP, Chou PH, Hsu JC, Lin KC. The detection of ureteral injuries after hysterectomy. J Minim Invasive Gynecol 2006;13:403–8.
18. Cosson M, Lambaudie E, Boukerrou M, Querleu D, Crépin G. Vaginal, laparoscopic, or abdominal hysterectomies for benign disorders: immediate and early postoperative complications. Eur J Obstet Gynecol Reprod Biol 2001;98:231–6.
19. Ibeanu OA, Chesson RR, Echols KT, Nieves M, Busangu F, Nolan TE. Urinary tract injury during hysterectomy based on universal cystoscopy. Obstet Gynecol 2009;113(1):6–10.
20. McPherson K, Metcalfe MA, Herbert A, Maresh M, Casbard A, Hargreaves J, Bridgman S, Clarke A. Severe complications of hysterectomy: the VALUE study. BJOG 2004;111:688–94.
21. McPherson K, Herbert A, Judge A, Clarke A, Bridgman S, Maresh M, Overton C. Psychosexual health 5 years after hysterectomy: population-based comparison with endometrial ablation for dysfunctional uterine bleeding. Health Expect 2005;8:234–43.
22. Ikram M, Saeed Z, Saeed R, Saeed M. Abdominal versus vaginal hysterectomy. Professional Med J 2008;15:486-91.
23. Iftikhar R. Vaginal hysterectomy is superior than abdominal hysterectomy. J Surg Pak 2008;13:55–8.
24. Akingba DH, Deniseiko-Sanses TV, Melick CF, Ellerkmann RM, Matsuo K. Outcomes of hysterectomies performed by supervised residents vs those performed by attendings alone. Am J Obstet Gynecol 2008;199:673.e1-6.
25. Oláh KS, Khalil M. Changing the route of hysterectomy: the results of a policy of attempting the vaginal approach in all cases of dysfunctional uterine bleeding. Eur J Obstet Gynecol Reprod Biol 2006;125:243–7.
26. Kovac SR. Guidelines to determine the route of hysterectomy. Obstet Gynecol 1995;85(1):18–23.
27. Schindlbeck C, Klauser K, Dian D, Janni W, Friese K. Comparison of total laparoscopic, vaginal and abdominal hysterectomy. Arch Gynecol Obstet 2008;277:331–7.

28. Sesti F, Calonzi F, Ruggeri V, Pietropolli A, Piccione E. A comparison of vaginal, laparoscopic-assisted vaginal, and minilaparotomy hysterectomies for enlarged myomatous uteri. Int J Gynaecol Obstet 2008;103:227–31.
29. Khan I, Shazia, Farooq M. Vaginal Hysterectomy: study of 75 cases. Ann King Edward Med Coll 2005;11:356–7.
30. Khan A. Why Not Vaginal Route for Hysterectomy. Pak J Obstet Gynaecol 1997;10(3):11–7.
31. Henry D, Muriel FR, Hirway P. Sustaining improvement in surgical infection prevention measures forhysterectomy. J Healthc Qual 2007;29(5):50–6.
32. Tabassam S, Tajammul A, Arif W. Vaginal Hysterectomy. Pak J Obstet Gynaecol 1997;10(1,2):1–5.
33. Ashraf M. Vaginal Hysterectomy for Conditions Other Than Prolapse. Ann King Edward Med Coll 1998;4(3):16–7.
34. Bashir R, Parveen Z, Sultana R, Khan B. A two years audit of complications of hysterectomy at Ayub Teaching Hospital Abbottabad. J Ayub Med Coll Abottabad 2005;17(2):47–9.
35. Charoenkwan K, Phillipson G, Vutyavanich T. Early versus delayed (traditional) oral fluids and food for reducing complications after major abdominal gynaecologic surgery. Cochrane Database Syst Rev 2007;17(4):CD004508.

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