

# Outcome assessment of total abdominal hysterectomy vs ascending vaginal hysterectomy

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## Abstract

**Introduction:** Hysterectomy is a reasonably safe, common and routine surgical procedure which rarely leads to perioperative death. Minor complications include postoperative infections, fever, wound hematomas or wound separation occur in approximately 25% of patients.

**Objective:** A comparative assessment of the post-operative outcomes of Sri Lankan patients subjected to total abdominal hysterectomy and ascending vaginal hysterectomy for benign uterine diseases.

**Methods:** A randomized controlled trial was conducted on 60 patients who underwent hysterectomy from July 2013 to June 2014, in a tertiary care hospital. Women those who were waiting for hysterectomy for benign uterine diseases within age 35-55yrs were included for the study. 30 patients underwent abdominal hysterectomy and 30 patients underwent vaginal hysterectomy. Five main variables were measured such as operative time in minutes, blood loss, post operative pain, pyrexia, hospital stay in days. Data entered and analyzed by SPSS 25.0.

**Result:** Age of participants was between 37 to 51 years of age. Mean age was 44.87 years among vaginal hysterectomy group (SD 3.4 years) and 44.71 among abdominal hysterectomy group (SD 3.756 years).

The average time duration for two procedures ( $t=10.4$ ;  $p<0.05$ ), average post operative hospital stay ( $t=10.1$ ;  $df=58$ ;  $p<0.05$ ), onset of post operative pain ( $X^2=31.0$ ;  $df=2$ ;  $p<0.05$ ) and average blood losses between two groups ( $t=14.97$ ;  $df=58$ ;  $p<0.05$ ) were significantly different. Onset of fever was not significantly different in two groups ( $X^2=0.48$ ;  $df=1$ ;  $p=.731$ ).

**Conclusion:** When comparing abdominal hysterectomy and vaginal hysterectomy the time taken for abdominal hysterectomy and post operative stay at hospital following abdominal hysterectomy is higher than those of vaginal hysterectomy. Abdominal hysterectomy was associated with a significantly higher post operative pain. Onset of fever following surgery does not depend on the type of surgery.

**Key words:** hysterectomy, abdominal, vaginal, time, blood loss, pain, fever

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## Introduction

Hysterectomy is surgical removal of all or part of a uterus<sup>1</sup>. When the whole uterus is removed with the cervix it is called a total hysterectomy, whereas when the body of uterus is removed leaving the cervix behind it is called a subtotal hysterectomy<sup>2</sup>. Depending on the route of removal there are three main ways of removal of uterus. Abdominal hysterectomy (AH), vaginal (VH) or ascending vaginal hysterectomy (AVH), and laparoscopic hysterectomy (LH)<sup>2</sup>.

Vaginal hysterectomy dates back to ancient times. The procedure was performed by Soranus of Ephesus in 120 AD, and the many reports of its use in the middle ages were nearly always for the extirpation of an inverted uterus and the patients rarely survive<sup>3</sup>. The early hysterectomies were fraught with hazard and the patients usually died of hemorrhage, peritonitis, and exhaustion. Early procedures were performed without anaesthesia with a mortality of about 70%, mainly due to sepsis from leaving a long ligature to encourage the drainage of pus<sup>3</sup>. Thomas Keith from Scotland realized the danger of this practice and merely cauterized the cervical stump and allowed it to fall internally thereby bringing the mortality down to about 8%<sup>3</sup>.

The performance of the first laparoscopic hysterectomy was done by Harry Reich in Kingston, Pennsylvania in 1988<sup>4</sup>. Haemostasis in laparoscopic pelvic surgery was a major barrier to the uptake of this type of surgery, and one of Harry Reich's first developments was to demonstrate that, correctly applied bipolar diathermy energy could prevent haemorrhage from ovarian and uterine vessels<sup>4,5</sup>.

Hysterectomy is a reasonably safe, common and routine surgical procedure which rarely leads to perioperative death<sup>1,6</sup>. Overall mortality rates for abdominal hysterectomy or vaginal hysterectomy are 0.1-0.2%<sup>7</sup>. Minor complications including post-operative infections, fever, wound haematomas or wound separation occur in approximately 25% of patients and major complications including blood transfusions and injury to bowel, bladder or ureter occur in 5-14% of patients<sup>6,8</sup>. All 3 procedures can have their own complications, advantages and disadvantages.

The current trend in medicine is leaning towards the minimally invasive surgical procedures which have less

morbidity and good quality of life than traditional radical surgeries. Interestingly there are many non-surgical treatment options available for benign uterine diseases, which long before considered hysterectomy would be the only option. eg; uterine artery embolization for leiomyomas<sup>9,10</sup>. However the cost, the advanced technology, failures, recurrence and some unbearable side effects associated with these procedures make them less suitable for a country with low resources like Sri Lanka<sup>11</sup>.

After the introduction of laparoscopy in surgical field, hysterectomy has been a subject of debate due to great interest on minimally invasive surgery<sup>10</sup>. Although the laparoscopic hysterectomy (total laparoscopic or laparoscopy assisted vaginal hysterectomy) initially thought to be superior to the traditional abdominal hysterectomy on this point of view, comparison studies done over several years has shown laparoscopic hysterectomy has its own complications and limitations (eg; cost, technology, fine surgical skills etc)<sup>12</sup>. In a country like Sri Lanka main limiting factors for the use of laparoscopy would be the unavailability of facilities, long learning curve and the heavy workload<sup>8</sup>.

## Methods

Randomized control study was conducted at Teaching Hospital, Kandy from July 2013 to June 2014. Patients who were waiting for hysterectomy for benign uterine diseases and age between 35-55 yrs were included. Sample size calculation was done according to the Lwanga and Lameshow formula and it was taken as 30 for each arm<sup>14</sup>.

Those who met the inclusion criteria and who had given consent were randomized to TAH or AVH arms in equal numbers in the Gynecology Clinic, by nursing staff. Randomization was done using sequentially numbered, opaque, sealed envelopes. The randomization sequence was computer generated random numbers to ensure balanced allocation to each group.

A well structured data collection sheet consisting 31 questions in four divided parts was used as study instruments. Visual analogue scale assessment of pain was used for post operative pain assessment. It was done following the particular patients' surgical procedure. Data collection was done by face to face interviews, direct observations, examination and extraction from the bed head tickets. All the pre-

operative and post-operative investigations were done at the hospital laboratory at Teaching Hospital, Kandy, using same laboratory techniques, chemicals and machines, after having a discussion with the chief medical laboratory technician. All the pre-operative investigations were done at the clinic level.

All the surgeries were performed by a single senior Gynaecologist in Teaching Hospital, Kandy.

All the patients received standard prophylactic antibiotics (IV Co-amoxyclove 1.2g after excluding drug allergies) at the time of induction and during 1<sup>st</sup> post operative 24 hrs according to the ward policies and the consultant microbiologist opinion.

Pfannenstiell incision was used in all cases of TAH, three pedicel hysterectomy was performed. All the vascular pedicles were double ligated. Peritoneal closure was not done in all the procedures. Subcuticular absorbable sutures were used to close the abdominal incisions. Vaginal vault was closed in all cases. Peri-operative outcome was measured in terms of operative time in minutes, blood loss, bladder, bowel or ureteric injury. Post-operative outcome was measured in terms of post-operative pain, pyrexia, hospital stay in days, secondary hemorrhage, re opening and mortality.

The length of the operating time in minutes was recorded from the first surgical incision to the time at which all wounds were closed and dressed, excluding any additional time necessary to perform oophorectomy if required. Blood loss was estimated by measurement of aspirated blood and weighing of swabs using a same scale, immediately after the surgery. All the specimens were sent to the hospital pathology laboratory for the histological diagnosis. All the patients were prescribed an identical regimen of post-operative analgesia. Post-operative pain was assessed by a visual analogue scale, 24 hrs after the surgery by a medical officer who was not involved with the study otherwise. An indwelling urinary catheter was used until the patient was mobilized. Every patient had a hemoglobin estimation pre-operatively (within two days prior to surgery) and on the second post-operative day. Pre-operative body temperatures were measured one hour before the surgery. Post-operative temperatures were recorded 4 hourly and any patient having temperature more than

37.5°C after 24hrs was investigated. The length of hospital stay in days was measured from the morning of the first post-operative day (excluding the day of surgery) up to and including the day of the discharge. All statistical tests used were two-sided. SPSS version 25.0 for Windows software was used for data analysis. 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

Age of participants was between 37 years to 51 years of age. Mean age was 44.87 years among vaginal hysterectomy group (SD=3.4 years) and 44.71 among abdominal hysterectomy group (SD=3.756 years). Majority of participants were in the age group of 40-49 years (81.7%). Body Mass Index of participants ranged between 19.1 and 27.5. Majority of participants' (N=43) Body Mass Index was between 20-24.9 (71.7%). (Table 1) Operative time duration of the surgery was ranged between 30 minutes to 42 minutes for vaginal hysterectomy patients and 40 minutes to 51 minutes for abdominal hysterectomies. The average time duration for two procedures were statistically significant ( $t=10.4$ ;  $p<0.05$ ). (Table 2) Postoperative time duration was between three days to seven days for abdominal hysterectomy patients and two days to four days for vaginal hysterectomy. The average post operative hospital stay was significantly different between these two groups of participants ( $t=10.1$ ;  $df=58$ ;  $p<0.05$ ). (Table 3) Post operative pain was measured by using visual analogue scale applying for every participant. Score of the scale ranged between 1 to 10. State of severe pain was not detected within vaginal hysterectomy patients. Onset of post operative pain shows statistically significant difference between two groups ( $X^2=31.0$ ;  $df=2$ ;  $p<0.05$ ) (Table 4). The blood losses during surgery were between 70 ml to 120 ml in vaginal hysterectomy patients and 120 ml to 300 ml in abdominal hysterectomy patients. None of the patients needed blood transfusions during surgery. Average blood losses between two groups were significantly different. ( $t=14.97$ ;  $df=58$ ;  $p<0.05$ ) (Table 5).

**Table 1. Distribution of age and body mass index of participants**

	AVH		TAH	
	Mean	SD	Mean	SD
Age	44.87	3.4	44.17	3.76
BMI	21.94	1.85	21.95	1.83

AVH- Ascending Vaginal Hysterectomy, TAH- Total Abdominal Hysterectomy, BMI- Body Mass Index

**Table 2. Perioperative time duration of the surgery**

	Mean	S	
AVH	33.63	3.06	t = 10.4 df = 58
TAH	42.13	3.25	p<0.05

AVH- Ascending Vaginal Hysterectomy, TAH- Total Abdominal Hysterectomy

**Table 3. Post operative hospital stay of the participants**

	Mean	SD		
AVH	2.97	0.669	T=10.1	df=58
TAH	4.9	0.803	P<0.05	

AVH- Ascending Vaginal Hysterectomy, TAH- Total Abdominal Hysterectomy

**Table 4. Comparison of post operative pain of participants**

	AVH	TAH	
	No. (%)	No. (%)	
Mild pain	22	2	X <sup>2</sup> = 31.0
Moderate pain	8	16	df - 2
Severe pain	-	12	P<0.05

AVH- Ascending Vaginal Hysterectomy, TAH- Total Abdominal Hysterectomy

**Table 5. Comparison of perioperative blood loss**

	Mean (ml)	SD (ml)		
AVH	92.5	14.06	t-14.97	df-58
TAH	194.6	34.61	P<0.05	

AVH- Ascending Vaginal Hysterectomy, TAH- Total Abdominal Hysterectomy

## Discussion

When comparing the time periods taken for abdominal hysterectomy and vaginal hysterectomy, significantly longer time was taken for abdominal hysterectomy ( $p<0.05$ ). Both TAH and AVH were done by surgeons with excellent skills and proper training. All the surgeries taken for this study sample were done by two doctors. Therefore the surgeons' skills were evenly distributed among the whole study population. But the factors such as changing the theatre staff, changing the theatre lists were not considered during this study. But as performing a surgery is a team work, time consumed for a surgery depends on all above extended factors as well as patients factors.

In 2003 Riberto et al, has done a study using 20 patients and published that the time needed for a vaginal hysterectomy is significantly less than the time taken for an abdominal hysterectomy. According to the findings of this study the period of post operative hospital stay is significantly high in abdominal hysterectomy patients. Post operative pain and the perioperative blood loss are also significantly high in abdominal hysterectomy patients. It is obvious that generally a patient with open abdominal surgery takes a longer time to come back to normal status. The difference between the procedures of these two surgeries directly affects the post operative hospital stay of patients<sup>26</sup>.

The difference between the two mean values of post operative hospital stay was approximately two days. This significantly affects the health resource usage by patients and the patient's out of pocket expenses. Those factors should be addressed properly in future research. The study findings highlighted the need of cost effective and cost benefit analysis of the two surgical procedures. Pain and the discomfort caused by opening the abdominal cavity for abdominal hysterectomy is

much higher when compared to pain created by doing the same surgery using an existing natural opening such as vagina.

Pain is a subjective and multidimensional experience. Pre operative pain, anxiety, age and type of surgery are four significant predictors for post operative pain<sup>28</sup>. Internationally accepted visual analogue scale was used to assess post operative pain.

Majority of the abdominal hysterectomy patients had experienced a mild pain condition and a significant number of abdominal hysterectomy patients had experienced a moderate to severe pain status. None of the vaginal hysterectomy patients had experienced a severe pain status. These findings clearly show that the post operative pain directly depend on the type of surgical procedure.

Also the personal variations such as age and anxiety which directly affect pain were not considered during this study. There can be many confounding factors which directly affect the tolerance and sensitivity to pain, but they were not studied during this research due to time and economical limitations.

There was a significant difference in the amount of perioperative blood loss calculated during these two procedures. Perioperative blood loss was calculated by measuring the aspirated blood volume and the count of gauze towels and gauze swabs immediately after the surgery. None of the patients required blood transfusion during the surgery or post surgical period.

Calculating the blood loss by using the soaked towels and swabs gives a subjective measurement, which generates an inter observer error This information bias affects the internal validity of the study Estimated blood loss prior to the surgery was not calculated.

Although I had planned to calculate the blood loss by weighing the absorbed towels and swabs, it was not possible to follow that procedure practically. A fully soaked towel was considered as 80 ml of blood and a fully soaked swab was considered as 40 ml of blood. Therefore the total blood loss was calculated by using those values which are considered as the accepted values at Operation Theatre-C of General Hospital, Kandy.

Average blood loss for a vaginal hysterectomy was 92.3 ml and for abdominal hysterectomy it was 194.6 ml. According to the comparative analysis of hysterectomy done in 2007 by Aniuliene et. Al, in Lithuania, average blood loss for a vaginal hysterectomy was 195.3 ml and abdominal hysterectomy was 308.5 ml<sup>29</sup>. Therefore when comparing the two studies, blood loss was less in the patients at Teaching Hospital, Kandy. Reasons for this difference could be the differences in the set up, skills and the patients used in both studies.

The confounding factors which affect the blood loss such as accidental vascular cut injuries during surgery bleeding disorders with participants and high blood pressure during surgery were not taken into account in this study.

Post operative fever episodes were recorded in ten participants and six of them had undergone vaginal hysterectomy and four of them were abdominal hysterectomy patients. There was no significant difference observed, compared to other variables.

Cause for fever episodes could be many such as post operative infections lack of hydration etc. The risk of infection was minimal as a prophylactic antibiotic dose was given to all the participants during surgery and complete standard sterile procedures were followed during the surgical procedures. The causes for post operative fever episodes were not investigated during this study.

## Conclusion

When comparing abdominal hysterectomy and vaginal hysterectomy, the time taken, post operative stay at hospital is higher following abdominal hysterectomy than vaginal hysterectomy. Abdominal hysterectomy was associated with significantly severe post operative pain. Onset of fever following surgery does not depend on the type of surgery.

As a procedure vaginal hysterectomy is more comfortable for the patient as it was associated with less operative time, less pain and less post operative hospital stay. When considering hysterectomy, prevalence of post operative fever does not associate with the surgical procedure. According to this study, for patients of this age group, vaginal hysterectomy is more effective than abdominal hysterectomy.

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