

## EVALUATION OF INTRAOPERATIVE AND POSTOPERATIVE COMPLICATIONS OF ABDOMINAL AND VAGINAL HYSTERECTOMY: A PROSPECTIVE STUDY

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### Abstract

**Background:** Hysterectomy is one of the most common surgical procedures performed worldwide, with various approaches available, including abdominal and vaginal routes. Understanding the intraoperative and postoperative complications associated with these procedures is crucial for optimizing patient outcomes. **Methods:** It was A prospective observational study conducted in the department of Obstetrics and Gynecology of a tertiary care teaching hospital located in Kolkata, West Bengal India, the period of the study was November of 2014 to October of 2015. The sample size for each group of patients was calculated to be 42, which was rounded off to 50, giving a total calculated sample size of 100 patients. A consecutive sampling technique was employed, where patients undergoing either of the two approaches to hysterectomies were selected consecutively until the required sample size was reached in each of the groups. **Results:** It was observed that women undergoing VH were significantly older than those in the TAH group (p-value <0.001). almost 70% of the mothers in both the study groups were from rural areas. Most of the mothers in both the study groups were illiterate and belonging to families with low socioeconomic status. Significantly higher proportion of mothers in the TAH group (70%) had a positive history of previous pelvic surgery as compared to their VH counterparts (16%, p-value <0.001). The most common type of surgeries undergone by mothers of both the study groups were tubectomy and lower segment cesarean section respectively. it was observed that fibroids of uterus, including broad ligament and cervical fibroids were the most common indication for surgery in the TAH group (54%), while for those women undergoing vaginal hysterectomy, genital prolapse was the most common indication (78%). Other indications included dysfunctional uterine bleeding, ovarian cyst, adenomyosis, endometriosis, and elongation of cervix respectively. **Conclusion:** The results of the current study suggest that both abdominal and vaginal approaches to hysterectomy were found to be safe and efficacious for treating benign female reproductive pathologies. However, the vaginal method was favoured for managing cases of genital prolapse, individuals with a history of prior pelvic surgeries, and older patients. Moreover, it was shown that the utilisation of the vaginal method yielded significantly superior results compared to the abdominal approach in terms of intraoperative and postoperative outcomes, as well as patient recovery.



## INTRODUCTION

One of the most commonly performed major gynecological surgeries is the hysterectomy, a

procedure that involves the removal of the uterus.<sup>[1]</sup> Hysterectomies are performed due to a host of different indications, ranging from benign conditions such as the control of abnormal bleeding,

uterine prolapse, and complications related to pregnancy to the management of malignant diseases such as uterine and cervical cancers.<sup>[2]</sup> Despite much advances in the field, hysterectomies still remain a popular 'one-size-fits-all' management for female reproductive disorders worldwide.<sup>[3]</sup>

While the vaginal approach to hysterectomy has been around for a fairly long time, most hysterectomies worldwide now are performed abdominally, as several risk factors such as lack of pelvic relaxation, large uteri, previous history of pelvic surgery etc. being considered to be obstacles to performing the procedure.<sup>[4]</sup> However, abdominal hysterectomies bring with them their own set of issues, such as longer operative times, high risk of abdominal organ injury, increased risk of embolism, scarring etc.<sup>[5]</sup> As a result, literature is divided with regards to the choice of approach when performing the procedure. Trends vary significantly across countries and regions, with one of the procedures being preferred over the others in different institutions.<sup>[7,8]</sup> This is particularly the case for developing countries such as India, where the incidence of the surgery has been following a rising trend in the last few decades, but the literature comparing the procedures of abdominal and vaginal hysterectomies, especially for benign indications, are few.<sup>[7,8]</sup>

In this context, the present study was performed to study the and compare abdominal and vaginal hysterectomy with respect to their intraoperative and postoperative characteristics and complications among women undergoing the procedures for benign conditions at a tertiary care hospital of West Bengal, India.

## MATERIALS AND METHODS

**Study type and design:** A prospective observational study was performed.

**Study area:** The study was conducted in the department of Obstetrics and Gynecology of a tertiary care teaching hospital located in Kolkata, the capital city of the state of West, Bengal, an Eastern state of India.

**Study Period:** The study was conducted for a period of one year, from November of 2014 to October of 2015.

### Sample Size and Sampling Technique

The sample size for the present study was calculated using the formula for the calculation of sample sizes from the difference between two proportions. Based on a previous study by Verma et al., the incidence of vaginal hysterectomy was considered to be 60%, while that of abdominal hysterectomy was considered to be 30%. With a significance level of 5% and a power of 80%, the sample size for each group of patients was calculated to be 42, which was rounded off to 50, giving a total calculated sample size of 100 patients.<sup>[7]</sup>

A consecutive sampling technique was employed, where patients undergoing either of the two approaches to hysterectomies were selected consecutively until the required sample size was reached in each of the groups.

### Inclusion and Exclusion Criteria

Mothers who were admitted to the study institution during the period of the present study and were scheduled to undergo either abdominal or vaginal hysterectomy due to benign conditions were included in the present study. Hysterectomies for obstetric indications, those following myomectomies, and those for malignant indications were excluded from the study. Written informed consent was obtained from each of the study participants before being included to the present study, and those refusing to provide such were excluded from calculations.

### Study Technique

After being admitted to the study institution, each of the patients were interviewed with a predesigned, pretested, researcher-administered questionnaire to generate data related to their sociodemographic and clinical characteristics. A detailed physical examination (general survey, systemic & pelvic examination) was done to confirm the clinical diagnosis for which the patient was indicated to undergo hysterectomy. Following that, pre-anesthetic fitness check was performed for each of the patients, and they were assigned dates for surgery. At the day of surgery, all patients were given prophylactic antibiotic (Ceftriaxone 1gm I.V) before being admitted to the operation theatre, where they underwent either abdominal or vaginal hysterectomy. In abdominal hysterectomy, the patient was put in dorsal supine position. After antiseptic dressing and draping, skin was opened by suprapubic transverse incision, and the uterus was elevated using broad ligament clamps. After ligation of the round and the infundibulo-pelvic ligaments, the bladder was dissected from the uterine segment. Bilateral uterine vasculature were then skeletonized and clamped, ligated, and cut. The uterus was removed after clamping, ligation and cutting of the bilateral cardinal and uterosacral ligaments. After removal of uterus, the vaginal cuff was closed, the pelvis thoroughly irrigated, and hemostasis achieved.

In vaginal hysterectomies, each patient was put in dorsal lithotomy position, with adequate padding. After antiseptic, dressing & draping, the bladder was emptied and a thorough vaginal examination was done. Following it, Sims' posterior vaginal speculum was introduced and the anterior lip of cervix was held by multiple teathed vulsellum. An inverted "T" incision was made on the anterior vaginal wall. Vesicocervical ligament was held up and divided. Cutting the uterovesical peritoneum, the posterior vaginal wall along the cervicovaginal junction was cut. Three clamps were placed. First clamp included uterosacral ligament, Mackenrodt's ligaments & descending cervical artery; the second

clamp included uterine artery and base of the broad ligament; and the final clamp included the round ligament, fallopian tube, mesosalpinx & ligament of the ovary. The uterus was then removed by anterior colporrhaphy & posterior colpo-perineorrhaphy. For each of the surgeries, intraoperative parameters (time taken for surgery amount of blood loss, any complications and difficulties) were observed and noted. Each of the women were followed up till discharge, during which complications were noted and recorded. Blood transfusion requirements during both the intraoperative as well as postoperative periods were also noted.

### Ethical Considerations

Appropriate ethical permissions were obtained from the Institutional Ethics Committee of the study institution before the commencement of the research. Written informed consent was obtained from each participant, and their anonymity and confidentiality of their information was ensured.

## RESULTS

It was observed that women undergoing VH were significantly older than those in the TAH group (p-value <0.001). almost 70% of the mothers in both the study groups were from rural areas. Most of the mothers in both the study groups were illiterate and belonging to families with low socioeconomic status. Significantly higher proportion of mothers in the TAH group (70%) had a positive history of previous pelvic surgery as compared to their VH counterparts (16%, p-value <0.001). The most common type of surgeries undergone by mothers of both the study groups were tubectomy and lower segment cesarean section respectively. No significant differences were observed between the groups with respect to their residence, education, and socioeconomic status. [Table 1]

Regarding the indication for hysterectomy, it was observed that fibroids of uterus, including broad ligament and cervical fibroids were the most

common indication for surgery in the TAH group (54%), while for those women undergoing vaginal hysterectomy, genital prolapse was the most common indication (78%). Other indications included dysfunctional uterine bleeding, ovarian cyst, adenomyosis, endometriosis, and elongation of cervix respectively. When the comorbidity profiles of the women were examined, it was observed that the most prevalent comorbidity among women in the VH group was hypertension (18%) followed by obesity (6%). On the other hand, in the TAH group, the most prevalent comorbidity was anemia (18%), followed by hypertension (12%) and obesity (12%) respectively. [Table 2]

Intraoperative and postoperative characteristics were observed to vary between the two groups of study participants. The mean duration of surgery for the two groups did not differ significantly from each other (92.7±18.6 mins in VH vs 95.6±11.3 min in TAH, p-value 0.347). While intraoperative blood transfusion requirement for the two study groups were not significantly different (48% in VH group vs 62% in TAH group, p-value 0.159), the mean amount of intraoperative blood lost was significantly higher in the TAH group as compared to the VH group (137.9±21.2 ml in VH vs 185.7±14.8 ml in TAH, p-value <0.001). Similarly, the difference between the incidence of immediate (<24 hours) postoperative complications (bleeding from wound, oliguria, hypotension, hematuria etc.) was not found to be significantly different between the groups, but the TAH group participants had significantly higher incidence of delayed complications (urine retention, post-op pain, fever, wound infection etc.) (p-value <0.001). It was observed that postoperative hospital stay (7.5±2.2 days in VH vs 8.6±1.9 days in TAH, p-value 0.013) and postoperative requirement of blood transfusion (12% in VH vs 32% in TAH, p-value 0.016) were significantly more in the TAH group. All but one mothers in each of the groups were discharged in stable condition following surgery. [Table 3]

**Table 1: Distribution of study participants according to their sociodemographic characteristics (n=100)**

| Parameters                  | Vaginal hysterectomy (50) | Abdominal hysterectomy (50) | p-value |
|-----------------------------|---------------------------|-----------------------------|---------|
| Age                         | 54.7±8.8                  | 41.3±6.1                    | <0.001* |
| Rural residence             | 35                        | 31                          | 0.713   |
| Education                   |                           |                             |         |
| Illiterate                  | 37                        | 28                          | 0.227   |
| Primary                     | 8                         | 11                          |         |
| Secondary                   | 4                         | 7                           |         |
| Higher secondary and up     | 1                         | 4                           |         |
| Low socioeconomic status    | 42                        | 40                          | 0.603   |
| Previous history of surgery | 8                         | 35                          | <0.001* |

\*Statistically significant

**Table 2: Distribution of study participants according to clinical characteristics (n=100)**

| Parameters     | Vaginal hysterectomy (50) | Abdominal hysterectomy (50) |
|----------------|---------------------------|-----------------------------|
| Indications    |                           |                             |
| Fibroid Uterus | 2                         | 27                          |
| DUB            | 2                         | 7                           |
| Ovarian Cyst   | 0                         | 3                           |
| Adenomyosis    | 0                         | 6                           |
| Endometriosis  | 0                         | 7                           |

|                        |    |   |
|------------------------|----|---|
| Genital Prolapse       | 39 | 0 |
| Elongation of Cervix   | 7  | 0 |
| Comorbidities          |    |   |
| Hypertension           | 9  | 6 |
| Diabetes               | 2  | 2 |
| Asthma                 | 1  | 1 |
| Anemia                 | 1  | 9 |
| Ischemic heart disease | 1  | 0 |
| Obesity                | 3  | 6 |

**Table 3: Comparison of intraoperative and postoperative characteristics of participants (n=100)**

| Parameters                         | Vaginal hysterectomy (50) | Abdominal hysterectomy (50) | p-value |
|------------------------------------|---------------------------|-----------------------------|---------|
| Surgery time (mins)                | 92.7±18.6                 | 95.6±11.3                   | 0.347   |
| Intraoperative blood loss (ml)     | 137.9±21.2                | 185.7±14.8                  | <0.001* |
| Immediate complications            | 3                         | 9                           | 0.065   |
| Delayed complications              | 8                         | 24                          | <0.001* |
| Postoperative hospital stay (days) | 7.5±2.2                   | 8.6±1.9                     | 0.013*  |
| Intraoperative blood transfusion   | 24                        | 31                          | 0.159   |
| Postoperative blood transfusion    | 6                         | 16                          | 0.016*  |
| Good outcome at discharge          | 49                        | 49                          | 1.000   |

\*Statistically significant

## DISCUSSION

In the present study, 50 women undergoing vaginal hysterectomy (VH) were compared with 50 women undergoing abdominal hysterectomy (TAH) with respect to their sociodemographic and clinical characteristics as well as intraoperative and postoperative outcomes. The study showed the mean age of women undergoing vaginal hysterectomy was significantly higher than those undergoing abdominal hysterectomy. This was similar to the findings reported by Chen B et al. in China and Umeora OIJ et al. in Nigeria.<sup>[10,11]</sup> Dewan R et al. in India also reported findings similar to the present study.<sup>[12]</sup> The probable reason for such an observation might be that menopause-associated depletion of estrogenic support to the endopelvic fascia as well as age related degenerative changes predispose older women to developing genital prolapse, which is one of the primary indications for VH. This assessment is confirmed by the observations made in the present study, where genital prolapse was the indication for 78% of all vaginal hysterectomy surgeries. Findings reported by other researchers on the topic also support this assertion.<sup>[11-13]</sup>

The present study observed that although not statistically significant, vaginal hysterectomy was more common in women with a comparatively low educational status as compared to abdominal hysterectomy group. Similar observations were also made with respect to their socioeconomic status too. A study conducted at Copenhagen showed similar findings, reporting that women with higher socioeconomic status and/or higher education were less likely to have a vaginal hysterectomy than their counterparts. It has been suggested that this is due to the lack of information about the TAH procedure and apprehensions towards the same, which is more likely to occur in people with lesser access to information, such as those socioeconomically and educationally challenged. The observations made in

the present study seem to corroborate these assumptions.<sup>[14]</sup>

In the present study, a previous history of lower abdominal surgery was found to be significantly associated with TAH surgery. Only 10% of women undergoing VH were found to have a positive history of previous lower abdominal surgery, as compared to 62% in the TAH group. This finding was contrary to that reported by Singh A and Bansal S in their study, where the authors found that the prevalence of positive history of previous lower abdominal surgery was 30% in the VH group and 32% in the TAH group.<sup>[15]</sup> The observations made in the present study might be specific for the study institution, where patients with a previous history of lower abdominal surgery are not usually recommended vaginal hysterectomy because of a perception of increased risk of complications as well as a lack of expertise in performing non-descent vaginal hysterectomies by the surgeons.

One of the primary objectives of the present study was to assess the intraoperative and postoperative complications suffered by the patients undergoing hysterectomy by either the vaginal or the abdominal approach. In the present study, it was seen that the mean operative time was similar between the two groups, at around 90 minutes. Whereas the average time taken to perform TAH was similar to that reported by other authors researching the topic, the vaginal hysterectomies performed were observed to take a substantially longer time as compared to that reported by studies conducted elsewhere.<sup>[10,16,17]</sup> This discrepancy in the observations might be explained by the fact that the majority of the vaginal hysterectomies performed during the study period were for women with advanced genital prolapse with large cystocele, rectocele, associated with infection. This required more dissection and hemostasis as well as additional buttress sutures.

Regarding the intraoperative complications experienced by the patients, it was observed that those women undergoing TAH had a significantly

higher average intraoperative blood loss as compared to their VH counterparts. However, the requirement of intraoperative blood transfusions were not significantly dissimilar between the two study groups. Similar observations have been made by authors such as Shanthini et al. and Kumar et al. in their research.<sup>[18,19]</sup> While other research on the topic have observed bowel and bladder injuries as significant complications encountered for both the VH as well as TAH procedures, in the present study, organ injuries were not observed.<sup>[17,18,20]</sup> The probable reason for this might be the fact that in the study institution, a multidisciplinary team of surgeons and obstetricians perform procedures which are deemed to be complicated and/or might pose a risk for intraoperative complications such as organ injury.

On examining postoperative complications among the study participants, the present study found that while there were no significant differences between the two intervention groups with respect to the incidence of immediate complications (those occurring within 24 hours of surgery, viz. bleeding from wound, oliguria, hypotension, and hematuria), patients undergoing TAH had significantly higher incidence of delayed postoperative complications (urinary retention, postoperative pain, wound dehiscence, abdominal distention and surgical site infection). Patients undergoing TAH also had a significantly higher requirement of postoperative blood transfusion as compared to the VH group participants. Similar observations have been made by authors conducting studies on the topic in other parts of India as well as globally.<sup>[11,13,18,19]</sup> However, pertinently, the incidences of both the immediate as well as delayed complications in the postoperative period as noticed in the present study were lower than those done a priori in the country, which can be attributed to the better tissue handling and anticipatory measures taken during surgery, proper antibiotics & good post operative care which were ensured for every patient.

Similar to the incidence of delayed postoperative complications, it was seen that those patients undergoing TAH had a significantly higher postoperative hospital stay as compared to those undergoing VH. While the average postoperative length of hospital stays reported by research done in India and elsewhere are similar to that observed in the present study for the TAH group, that for the VH group of patients were substantially lower in these studies.<sup>[11,21,22]</sup> This might be due to the fact that the majority of the cases operated via VH in the present study were patients of advanced uterine prolapse as well as non-descent cases. The final outcomes of the patient included in the present study both abdominal & vaginal hysterectomy groups were satisfactory.

## CONCLUSION

The findings of the present study indicate that while both abdominal and vaginal methods of hysterectomy were safe and effective in the management of benign female reproductive pathologies, the latter was preferred in management of cases of genital prolapse, those with previous history of pelvic surgeries, and older patients. Furthermore, it was seen that the vaginal approach was significantly better than the abdominal approach with respect to the intraoperative and postoperative outcomes and recovery in the patients.

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