INDICATIONS FOR AND IMMEDIATE PROBLEMS OF VAGINAL AND ABDOMINAL HystereCTOMY

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يَسْمَعُ اللَّهُ الرَّحْمَنُ الرَّحِيمُ

قُل رَبِّ اِزْعَلْنِي آنَ اِشْكُرْ نَعمَتَكَ الَّتِي أَنْعَمَتَ عَلَيِّ وَعَلِيٍّ وَالَّذِي وَان اَعْمَل صَالِحًا تَرْضَاهُ

وَبَارِكَ لِي فِي ذَرِيَّتِي
To...

My beloved parents....
For their patience and moral support.

My lovely little child...

Mohamed

My husband....

My sister and brothers...

To...

All those who stand beside me.

With my best wishes...
## Contents

<table>
<thead>
<tr>
<th>Subject</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Dedication</td>
<td>I</td>
</tr>
<tr>
<td>- Acknowledgment</td>
<td>II</td>
</tr>
<tr>
<td>- Abbreviations</td>
<td>III</td>
</tr>
<tr>
<td>- Abstract</td>
<td>IV</td>
</tr>
<tr>
<td>- Abstract (Arabic)</td>
<td>V</td>
</tr>
<tr>
<td>- List of tables</td>
<td>VI</td>
</tr>
<tr>
<td>- List of figures</td>
<td>VII</td>
</tr>
</tbody>
</table>

**CHAPTER ONE**

Introduction & Literature Review.............................  1
Objectives..........................................................  28

**CHAPTER TWO**

Patients & Methods...............................................  29

**CHAPTER THREE**

Results..............................................................  32

**CHAPTER FOUR**

Discussion..........................................................  49
Conclusion..........................................................  52
Recommendations....................................................  53
References..........................................................  54
Appendix
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hr</td>
<td>Hour</td>
</tr>
<tr>
<td>Kg</td>
<td>Kilogram</td>
</tr>
<tr>
<td>LAVH</td>
<td>Laparoscopic ally assisted Vaginal Hysterectomy</td>
</tr>
<tr>
<td>Mint</td>
<td>Minute</td>
</tr>
<tr>
<td>TAH+BSO</td>
<td>Total Abdominal Hysterectomy With bilateral salpingo-oophorectomy</td>
</tr>
<tr>
<td>KTH</td>
<td>Khartoum Teaching Hospital</td>
</tr>
<tr>
<td>Hb</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>VH + VR</td>
<td>Vaginal hysterectomy with Vaginal repair</td>
</tr>
<tr>
<td>VH- VR</td>
<td>Vaginal hysterectomy without Vaginal repair</td>
</tr>
</tbody>
</table>
ABSTRACT

A prospective study compared forty cases of abdominal hysterectomy with twenty cases of vaginal hysterectomy, had been carried out in KTH in the period from August 2003 to January 2004.

The aim of the study was to assess the immediate morbidity and mortality associated with each route.

The mean age of the patients underwent abdominal hysterectomy was estimated to be 50 years, 42.5% of them were postmenopausal, and 10% were nulliparous.

The main age of vaginal hysterectomy group was about 57 years, 70% were postmenopause, however, none of them was nulliparous.

Leiomyoma and malignant pathology were reported to be responsible for about 40% of preoperative indications in abdominal hysterectomy, while the majority of vaginal hysterectomy operations were done either for vaginal or uterine prolapse.

In about 65% of abdominal hysterectomy, accompanied salpingo-ophorectomy was done, however, no adnexa was found to be removed through the vagina in vaginal hysterectomy.

The most common intraoperative complication encountered was hemorrhage that necessitated blood transfusion in 57% of abdominal procedures and 25% of vaginal procedures.

Visceral injury had occurred only twice during abdominal hysterectomy.

The incidence of short term morbidity was higher following abdominal hysterectomy with the exception of febrile morbidity which was higher following vaginal hysterectomy.

The average operating time was found to be 105 min. For abdominal hysterectomy, with the average postoperative hospital stay of about 150 hr while those for vaginal approach were 75 min. And 111 hr consecutively.

Fortunately, no deaths had been reported.
ملخص الأطروحة باللغة العربية

 أجريت هذه "الدراسة وهي دراسة مقارنة "بمستشفي الخرطوم التعليمي في الفترة من (أغسطس 2003 -- يناير 2004)، لمقارنة عدد 40 حالة إزالة رحم عن طريق البطن مع عدد 20 حالة إزالة رحم عن طريق المهبل.

هدف الدراسة معرفة المضاعفات التي تحدث من جراء كل من العمليتين على المدى القريب، وخلصت الدراسة إلى أن متوسط عمر المريضات اللاتي أجريت لهن عملية إزالة الرحم عن طريق البطن كان 50 سنة، ومتوسط عمر المريضات اللاتي أجريت لهن العملية عن طريق المهبل كان 75 سنة.

من أهم دواعي العملية هي لحميات الرحم والأورام الخبيثة، وقد شكلت نسبتها معا 40% من مجموع دواعي عملية إزالة الرحم عن طريق البطن، بينما كان هبوط الرحم والمهبل من أهم الدواعي السابقة لإجراء عملية إزالة الحم عن طريق المهبل.

65% من عمليات إزالة الرحم عن طريق البطن كانت مصوحية بإزالة المبيضين وأنبوب الرحم، بينما لم تتم إزالة المبيضين وأنبوب الرحم عن طريق المهبل.

أكثر المضاعفات شيوعا أثناء العمليات كانت النزيف الذي استدعى عملية نقل دم في 57% من عمليات إزالة الرحم عن طريق البطن، و25% من عمليات إزالة الرحم عن طريق المهبل.

من أهم المضاعفات بعد العملية كانت الحمي وكانت أكثر شيوعا لدى المريضات اللاتي تعرضن لإزالة الرحم عن طريق المهبل، بينما كانت بقية المضاعفات أكثر شيوعا لدى المريضات اللاتي أجريت لهن عملية إزالة الرحم عن طريق البطن.

كان متوسط زمن إجراء العملية عن طريق البطن 105 دقيقة، بينما كان متوسط زمن إجراء العملية عن طريق المهبل 75 دقيقة.

كان متوسط الفترة التي أمضتها المريضات بالمستشفى عقب إجراء العملية حوالي 150 ساعة في حالة إزالة الرحم عن طريق البطن، و111 ساعة في حالة إزالة الرحم عن طريق المهبل.

خلال تلك الفترة لم تسجل أي حالة وفيات ناجمة عن أي من العمليتين.
## LIST OF TABLES

<table>
<thead>
<tr>
<th>NO OF TABLE</th>
<th>SUBJECTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Table 1)</td>
<td>Demographic characteristics of study population</td>
<td>36</td>
</tr>
<tr>
<td>(Table 2)</td>
<td>Demographic characteristics of study population</td>
<td>37</td>
</tr>
<tr>
<td>(Table 3)</td>
<td>Indications of abdominal &amp; vaginal hysterectomy</td>
<td>38</td>
</tr>
<tr>
<td>(Table 4)</td>
<td>Intra-operative complications</td>
<td>39</td>
</tr>
<tr>
<td>(Table 5)</td>
<td>Postoperative complications</td>
<td>40</td>
</tr>
<tr>
<td>(Table 6)</td>
<td>Operating time &amp; duration of postoperative hospital stay</td>
<td>41</td>
</tr>
<tr>
<td>(Table 7)</td>
<td>Postoperative investigations</td>
<td>42</td>
</tr>
</tbody>
</table>
### List of Figures

<table>
<thead>
<tr>
<th>No of Figures</th>
<th>Subjects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Figure 1)</td>
<td>Distribution of age group of study population</td>
<td>43</td>
</tr>
<tr>
<td>(Figure 2)</td>
<td>Modalities of abdominal hysterectomy</td>
<td>44</td>
</tr>
<tr>
<td>(Figure 3)</td>
<td>Modalities of vaginal hysterectomy</td>
<td>45</td>
</tr>
<tr>
<td>(Figure 4)</td>
<td>Number of units of blood in cases needed intraoperative transfusion</td>
<td>46</td>
</tr>
<tr>
<td>(Figure 5)</td>
<td>Educational levels of cases of abdominal hysterectomy</td>
<td>47</td>
</tr>
<tr>
<td>(Figure 6)</td>
<td>Educational levels of cases of vaginal hysterectomy</td>
<td>48</td>
</tr>
</tbody>
</table>
CHAPTER ONE
INTRODUCTION & LITERATURE REVIEW

1-1: INTRODUCTION:

Hysterectomy is a routine but major gynecological operation. The uterus may be removed through an incision in the abdominal wall. A total abdominal hysterectomy is the removal of both the corpus and the cervix.

The cervix may be left in situ, this is a subtotal hysterectomy. An alternative method, vaginal hysterectomy, consists of removal of the uterus through the vagina. At the time of hysterectomy, one or both tubes or ovaries also may be removed, a procedure termed a unilateral or bilateral salpingo-oophorectomy (1).

Hysterectomy is the second most common surgical procedure performed in the United States. Annually, more than 600,000 women undergo the procedure (2).

One in three American women has the procedure by age 60, a higher percentage than in any other country (3).

Over 1000 hysterectomies are performed in the United Kingdom every week, and one in five women can expect such surgery by the age of 60 years (1).

With advancement in medical conservative therapy of gynecological conditions, the need for hysterectomy had declined. More women wish to avoid major surgery if equally efficacious alternative exist (4).

Despite efforts to explain it's high incidence, the perception remains that a significant number of hysterectomies are unjustified.

More indications are listed for hysterectomy than for any other major operation. A quality assurance process is presented that required the surgeon to select preoperatively one designated indication for each hysterectomy performed (5).
The decision about whether to undergo a hysterectomy is often a difficult and emotional one for the patients. The physician must understand this and adequately counsel the patient preoperatively.

Issues regarding loss of replacement, and the loss of a monthly period must be discussed in detail.

The patient must go into surgery confident that it is the correct course of action\(^{(6)}\).

1-2: History Of Hysterectomy:

The first abdominal hysterectomy was performed by Charles Clay in Manchester, England 1843; unfortunately the diagnosis was wrong and the patient died in the immediate post-operative period. The following year; Charles Clay was almost the first to claim surviving patient, however she died post-operatively and it was not until 1843 that Ellis Bunham from Lowell, Massachusetts achieved the first successful abdominal hysterectomy although again the diagnosis was wrong. Vaginal hysterectomy dates back to ancient times. The procedure was performed by Soranus of Ephesus 120 years after the birth of Chris, and the many reports of it's use in the middle ages were nearly always for extirpation of an inverted uterus and the patient rarely survived. The early hysterectomies were fraught with hazards and the patients usually died of haemorrhage, peritonitis and exhaustion. Early procedures were performed without anaesthesia with a mortality of about 70 %mainly due to sepsis from leaving along ligature to encourage the drainage of pus. 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 8%. Hysterectomy becomes safer with the introduction of anaesthesia, antibiotics, antisepsis, blood transfusion and intravenous therapy. During the 1930s Richardson introduced the total abdominal hysterectomy to avoid serosanguinus discharge from the cervical remnant and
the risk of cervical carcinoma developed in the stump. Apart from this innovation and the transverse incision introduced by Johanns Pfannenstiel in the 1920s. there was little advance in hysterectomy technique until the advent of endoscopic surgery and the performance of the first laparoscopic hysterectomy by harry reich in Kingston, Pennsylvania in 1988 the refinement and increasing safety of laparoscopic hysterectomy suggest that it will be used increasingly in the future, although development in photodynamic therapy and interventional radiology may reduce the traditional indication for the operations (7).

**Literature review:**

**2-1 indications:**

Clarke A. and colleagues reported that the principal indications for abdominal hysterectomy were bleeding, pain or both. Symptoms were severe enough to be socially debilitating and have a major 1 impact on life style. Otherwise the women were in a good health (8). Carlon K.J. and colleagues found that the most frequent indications for hysterectomy were, leiomyoma 35%, abnormal bleeding 22% and chronic pelvic pain 18% (9). Also it was reported that the most common indications for abdominal hysterectomy were uterine leiomyoma followed by pelvic endometriosis and pre-malignant disease (10). In Finland Luoto et al found that the most frequent indications for hysterectomy were leiomyoma 50%, and endometriosis 11%. Prolapse, menstrual disorders and cancer each accounted for 7-8% of all hysterectomies (11).

women aged 25-53 years were most likely to have hysterectomy for hormonally influenced conditions, leiomyoma and endometriosis. For women over the age of 54 years, who generally have lower oestrogen levels, the most common reasons for hysterectomy were prolapse and cancer. Uterine
leiomyoma continues to be the most common reason for hysterectomy and 2Today, accounted for one third of such procedure \(^{(12)}\).

Today, 25%-30% of hysterectomies in the United States are done vaginally. Vaginal hysterectomy, abdominal hysterectomy, and LAVH are entirely different operations and are not done on comparable patients. This must be remembered when morbidity and mortality rates are compared. Certainly it is clear that postoperative morbidity is lower with vaginal hysterectomy and LAVH, but patients with more serious disease are operated on through an abdominal incision.

Vaginal hysterectomy is done most often for benign disease including recurrent and severe dysfunctional uterine bleeding unresponsive to hormonal therapy and uterine curettage; serious symptoms of uterine prolapse, usually associated with relaxation of the vaginal walls; small symptomatic uterine leiomyomas causing excessive uterine bleeding; and cervical intraepithelial neoplasia, particularly carcinoma in situ.

Most of the relative contraindications to vaginal hysterectomy drive from the limited exposure that is attainable with this approach. If, however, normal anatomy is severely distorted by acute or chronic infection, adhesions, endometriosis, and so forth, adequate exposure is often unattainable through a vaginal incision, thus contraindicating the vaginal approach.

Lack of uterine descent or nulliparity, while potentially making the hysterectomy more difficult, does not stand as a general contraindication to vaginal hysterectomy.

Previous cesarean delivery is not a contraindication to traditional vaginal hysterectomy. Whether approached abdominally or vaginally, a scarred vesicouterine plane can make dissection of this space more difficult. The vaginal approach is usually easier, however, when the correct plane can
be entered where it is least scarred (i.e towards the vagina) and the dissection extended up along this plane toward the area of maximal scar.

Significant uterine enlargement is a relative contraindication to traditional vaginal hysterectomy. An arbitrary uterine size at which the abdominal approach becomes preferred can not be dogmatically stated. The decision depends rather on uterine shape, adequacy of the pelvis, obesity, descensus, vaginal caliber, and most importantly surgeon skills and experience\(^{13}\).

Kovac SR et al, in their statistical model for determining physician decision- making and patient outcome, found a significant overlap between the indications for abdominal and vaginal hysterectomy\(^{14}\). Querleu D, and colleagues concluded that even when the vaginal route is not contraindicated, several factors appear to limit vaginal hysterectomy, such as the absence of formal practice guidelines that identify appropriate for vaginal hysterectomy, abdominal hysterectomy, and LAVH, lack of training and experience in vaginal and laparoscopic technique, and fear of performing vaginal surgery when the uterus is enlarged or in the absence of uterine prolapse\(^{15}\).

2-2: Types of hysterectomy:

There are various types of hysterectomy and it is important that the woman knows which procedure she is having. the type used will depend on the reason for the hysterectomy.

-**Total abdominal hysterectomy:**

This involves the removal of the uterus and the cervix through a horizontal cut in the abdomen just above the public bone, a Pfannenstal or "bikini-line" incision. Some women may require a vertical incision where there is a large abdominal swelling or a previous scar.
- **Total abdominal hysterectomy with bilateral salpingo-oophorectomy:**

This refers to the removal of both Fallopian tubes and ovaries and is often performed at the same time as a TAH particularly where there is evidence of disease or if the women is approaching the menopause or is already post-menopausal. Oophorectomy obviously prevents ovarian cancer in the future. For pre-menopausal women an attempt is made to conserve the ovaries if they are healthy, to avoid a sudden decrease in oestrogen which could cause severe menopausal symptoms. It has been shown, however, that if ovaries are conserved they may have a decreased hormonal function in pre-menopausal women, possibly because their blood supply may be compromised during surgery.

- **Subtotal hysterectomy:**

This procedure is rarely performed today but is growing in popularity, it refers to the removal of the uterus while leaving the cervix behind, regular cervical smears remain necessary.

- **Radical/Wertheim's hysterectomy:**

This is an extended hysterectomy where the uterus, ovaries, Fallopian tubes, adjacent pelvic tissue, lymph nodes and the upper third of the vagina are removed. This is necessary in cases of advanced cervical and endometrial cancer. The ovaries may be conserved in a younger women.

- **Vaginal hysterectomy:**

This involves the removal of the uterus through the vagina, with conservation of the ovaries. A vaginal hysterectomy is usually performed in order women where there is a prolapse of the uterus. Contraindication to vaginal hysterectomy include a bulky uterus (larger in size than 14 weeks pregnancy), and suspected or known malignancy. This type of hysterectomy by women, although this is not an accurate description. There will be no abdominal scar\(^{(1)}\).
Hidlebaugh, D-A from department of Gynecology, Cleveland Clinic Florida, Naples, USA found that vaginal hysterectomy is the least costly of hysterectomy techniques \(^{(16)}\).

Until recently, most gynecologists limited the use of vaginal hysterectomy for benign conditions confined to the uterus like uterine prolapse, small symptomatic leiomyoma, recurrent or severe dysfunctional uterine bleeding, and carcinoma in situ of the cervix \(^{(17)}\). Vaginal hysterectomy was performed less frequently when the vaginal route was presumed inaccessible or when more severe pathologic conditions were supposed to exist, such as endometriosis, pelvic adhesions, adnexal disease, and chronic pelvic pain \(^{(18)}\).

**- Laser-assisted laparoscopic vaginal hysterectomy:**

It refers to vaginal hysterectomy including removal of the ovaries. This procedure is not designed to replace either abdominal or vaginal hysterectomy but it offers a less invasive option to women facing abdominal hysterectomy and oophorectomy. The operation takes no longer with a skilled surgeon and the hospital stay is reduced to two days. There is little post-operative pain, intra-operative blood loss is reduced significantly and four small incisions replace a large abdominal wound. This operation is not widely available \(^{(1)}\). However, the America College of Obstetricians and Gynecologists acknowledges that laparoscopically assisted vaginal hysterectomy (LAVH) is an acceptable alternative to abdominal hysterectomy, but its use is advocated especially in cases of pelvic pain or suspected adnexal masses or pelvic abnormalities caused by endometriosis, infection, or previous surgery \(^{(19)}\).

Munro MG, Parker WH. In their classification system for laparoscopic hysterectomy, they stated that the term laparoscopic hysterectomy has been applied to a variety of procedures, ranging from adhesiolysis only to total hysterectomy under endoscopic direction \(^{(20)}\).
In many centers laparoscopic hysterectomy has found a place in gynecological practice as an alternative to abdominal hysterectomy but not to vaginal hysterectomy. Most hysterectomies currently performed with an abdominal approach may be performed by laparoscopic dissection of part or all of the abdominal portion followed by vaginal removal. There are many surgical advantages particularly magnification of the anatomy and pathology, to achieve complete haemostatic and clot evacuation under water examination. Patient's advantages are multiple related to avoidance of a pain producing abdominal incision, improved cosmetics, reduced period of hospitalization and recuperation and an extremely low rate of cuff infection and ileus. In experienced hands the complications rate is low\(^{(21)}\).

The cost of laparoscopic hysterectomy is greater during the operation with longer operating time and cost of disposable instruments, however the cost of treatment is less because of the shortened postoperative stay. So the procedure is safe and cost effective\(^{(22)}\).

Michel E. Rivlin stated that, as more surgeons learn the techniques, laparoscopic methods are gaining in popularity\(^{(23)}\).

**2-3 TECHNIQUES OF HYSTERECTOMY:**

**Technique of Abdominal Hysterectomy:**

After administration of anesthesia, the patient is placed in a frog-leg position and an examination is performed. A reassessment of pelvic finding is undertaken to reaffirm the appropriateness of the proposed surgical approach. This is particularly important prior to surgery for a pelvic mass and when the choice of incision has not been definitively determined. An indwelling Foley catheter is placed under sterile technique after the vagina has been prepped, and the patient's abdomen prepped and draped.
Multiple factors are involved in determining the type of incision to use. Generally in surgery for a large mass or potential malignancy, a vertical incision is chosen. This incision provides optimal exposure and may be extended as necessary. A benign condition is commonly approached using a Pfannenstiel incision. The advantages of this incision are the strength of the scar and the cosmetically acceptable result. With this incision exposure may be limited, although it may be converted to a Maylard or Cherney incision if necessary.

The abdominal incision is carried down in layers, and the peritoneal cavity is entered with care. Peritoneal washings are obtained if there is any suspicion of malignancy. Manual upper abdominal exploration is performed systematically, with palpation of the kidneys, liver, gallbladder, stomach, and para-aortic lymph nodes. The pelvis is then assessed, and a self-retaining retractor is placed. With the patient in the Trendelenburg position, the bowel is backed away with moist laparotomy pads.

Long Kelly clamps are used to grasp the uterus bilaterally along the cornua. Traction can thus be applied to the uterus, facilitating dissection. The round ligaments are clamped, cut, and suture-ligated bilaterally, thus allowing access to the anterior and posterior leaves of the broad ligament. The anterior and posterior leaves of the broad ligament. The anterior leaf of the broad ligament is dissected bilaterally from the round ligament to the mid-line of the vesicouterine peritoneal fold.

If the tubes and ovaries are to be left in situ, a window is developed in an avascular area of the posterior leaf of the broad ligament. The tube and uteroovarian ligament are the doubly clamped, with care being taken not to compromise the blood supply to the ovary. These pedicles are then cut and suture-ligated. A second ligature is usually placed around this vascular pedicle.
If a salpingo-oophorectomy is to be performed, the peritoneum is incised over the infundibulopelvic ligament. The retroperitoneum is then bluntly dissected down to the level of the iliac vessels. The ureter is directly identified on the medial leaf of the peritoneum. A window is developed in the avascular space of the medial leaf of the peritoneum, above the ureter and below the infundibulopelvic vessels. The infundibulopelvic ligament is then doubly clamped, cut, and suture-ligated. A second ligature is placed around this highly vascular pedicle.

Attention is then turned to dissection of the bladder from the lower uterine segment. Upward traction on the uterus facilitates the sharp dissection in an vascular midline plane. Blunt dissection may be used to aid in this procedure but should be avoided in the presence of scarring or when the patient has had a cesarean section.

The uterine vessels are then isolated bilaterally by dissecting the adjacent areolar connective tissue downward in a process referred to as skeletonization. Clamps are then placed bilaterally across the uterine arteries at the level of the internal cervical os. The ureter tends to lie approximately 2 cm lateral to and below the vessel at this point. If curved clamps are used in this step, the curve should be directed toward the uterus rather than away from it. These pedicles are then cut and suture-ligated.

In stepwise fashion, the cardinal ligament is then isolated bilaterally by placing straight clamps along the axis of the cervix in the direction of the vagina. Again the clamps should be placed directly adjacent to the cervix. The uterosacral ligament are likewise clamped, cut, and suture-ligated bilaterally.

When the inferior border of the cervix is reached-this is confirmed by palpation-an incision is made anteriorly to enter the vagina. The cervix is then incised from the vaginal cuff by continuing this incision circumferentially. The incision is made as close as possible to the cervix to preserve the vaginal
depth. Edges of the vaginal cuff are then grasped with Allis clamps at each of the corners.

Angle sutures are placed through each side of the vaginal cuff to ensure haemostasis in the area of the vaginal arteries. These angle are generally attached to the uterosacral and cardinal pedicles to provide support to the vaginal cuff.

If the cuff is to be left open, a running locked suture is continued around the entire circumferential edge of the cuff. This suture must incorporate the vaginal mucosal edge as well as the endopelvic fascia posteriorly to effect haemostasis.

If the surgeon's preference is to close the cuff, this is accomplished with a running suture incorporating both the anterior and the posterior edges of the cuff. If there is concern about oozing in the area, the cuff is generally left open for drainage. Inspection is carried out to ascertain adequate haemostasis at the cuff, and all pedicles are also carefully inspected at this time. The pelvis is irrigated with warm lactated Ringer's solution prior to closure of the abdominal cavity.\(^6\)

**Technique of Vaginal Hysterectomy:**

Prophylactic antibiotics should be administered about 1 hour before a vaginal hysterectomy. After adequate anesthesia is induced, the patient is placed in the dorsal lithotomy position, with the hips flexed and the legs in almost completely extension. The buttocks are positioned just over the edge of the table and the legs should be symmetrically aligned. The table is placed in a slight Trendelenburg position to help keep the bowel out of the operative field. The height of the table should be adjusted for the comfort of the assistants as well as the surgeon.

The patient is then prepped and draped, and the bladder is then emptied with a straight metal catheter. Examination under anaesthesia is performed to confirm preoperative findings and to assess the appropriateness of the planned
procedure. The degree of descent of the uterus may be evaluated by grasping the cervix with a Tenaculum and applying downward traction.

A circumferential incision is made around the cervix at the junction of the cervix with the vaginal mucosa, below the reflection of the bladder. The incision must be deep enough to reach the pericervical connective tissue, allowing relatively avascular dissection of the mucosa from the underlying connective tissue. Posteriorly the peritoneum is then grasped with forceps and sharply incised with a scissors, thereby opening the peritoneum of the posterior cul-de-sac. The tips of the scissors are directed upwards to avoid injury to the rectum. The peritoneum is then joined to the vaginal mucosa in the midline with an interrupted suture.

The peritoneal incision is extended bilaterally with scissors out to the junction with the uterosacral ligaments, sutures may be placed at these angles to aid the haemostasis and to approximate the peritoneum to the mucosal edge. A Steiner-Auvard speculum is then placed into the posterior cul-de-sac over the surgeon,s finger, which is protecting the rectum.

The uterosacral ligaments are clamped, cut, and ligated bilaterally with care being to incorporate the posterior peritoneum. The bladder is then dissected off the lower uterine segment in the midline until the anterior peritoneal reflection is reached. The correct midline cleavage plane is relatively avascular. A combination of sharp and blunt dissection is generally utilized, but sharp dissection is preferred if any scarring is present.

Once the anterior peritoneal reflection is identified, it is grasped with a forceps and incised with a scissors. The tips of the scissors are pointed downward to avoid injury to the bladder. After entry into the anterior peritoneum is confirmed by palpation, a narrow retractor is placed into the anterior cul-de-sac under the protective finger of the surgeon. If difficulty in identifying the peritoneal reflection is encountered, the surgeon,s finger may
be hooked around the fundus through the posterior cul-de-sac incision to help isolate the anterior peritoneum.

After entry into the anterior and posterior culs-de-sac, the cardinal ligaments and broad ligaments are clamped, cut, and suture-ligated bilaterally. The peritoneum is incorporated into the clamps both anteriorly and posteriorly to ensure inclusion of the major vessels into the pedicle.

Advancement up the broad ligament is continued, and the last pedicle includes the attachment of the fallopian tubes, the utero-ovarian ligament, and the round ligament. This adenexal pedicle is doubly ligated because of the inclusion of the ovarian vessels. At times, as the last pedicle is reached, visualization for clamp placement is difficult. In such instances, the fundus of the uterus may be delivered through the posterior cul-de-sac by placing traction on the fundus with towel clamps. The utero-ovarian pedicle may then be clamped from the fundus downward under direct visualization. Again this pedicle should be doubly ligated.

In a case involving a large, bulky, or fibroid uterus, various technique may be employed to facilitate completion of the procedure. After the uterine vessels have been clamped bilaterally, a myomectomy or bivalving of the uterus, may be performed. An alternative method is intramyometrial coring. In this case, a circumferential incision is made into the myometreum while downward traction is placed on the cervix, and the incision is advanced in the direction of the fundus. The result is a coring out of the central body of the uterus, thus decreasing the bulk of the fundus. Care must be taken not to advance the incision beyond the serosa of the uterus to avoid inadvertent damage to adjacent structures.

If the adenexae are to be removed, the ovaries are clamped with a Babcock clamps. A Heaney clamp is then placed across the infundibulopelvic ligament, and the adenexa is removed. This pedicle is also doubly suture-ligated because the ovarian vessels are contained within the pedicle.
All pedicles are inspected to ascertain haemostasis. Many surgeons choose to perform culdoplasty procedure to obliterate the cul-de-sac and help prevent the subsequent development of an enterocele. A suture is placed through the left uterosacral ligament, and several bites of redundant posterior peritoneum are included before the stitch is placed through the right uterosacral ligament. Similar additional sutures are placed as necessary to obliterate the cul-de-sac, sutures are then placed through the vagina and posterior peritoneum just to the right of the midline. The uterosacral ligaments are incorporated bilaterally, and the suture is then brought out again through the posterior vagina. These sutures are held until the peritoneal closure suture is placed. This uterosacral ligament placation helps to maintain the length of the vagina.

If an adequate uterosacral-cardinal ligament is present, the vault may be suspended from these areas bilaterally. A suture is placed through the apex of the posterior vagina and through the peritoneum, is continued through the uterosacral and cardinal ligaments, and is carried back out through the peritoneum and vaginal mucosa. This suspension suture is placed bilaterally.

The peritoneum may be closed by the use of a pursestring suture above the pedicles to ensure that any bleeding from the pedicles is extraperitoneal. This suture is placed prior to trying the vault suspension or culdoplasty sutures.

An alternative to performing a pursestring closure is to incorporate the peritoneum into the vaginal cuff closure after the culdoplasty sutures are tied. Horizontal mattress sutures that include the vaginal mucosal edge as well as the peritoneal edge are placed in a longitudinal fashion to help preserve vaginal depth (6).
**2-4 Complications of Hysterectomy:**

These are described by Hill DJ. as postoperative fever, haemorrhage, injury to adjacent organs, other complications and life threatening events. The incidence of postoperative infection and haemorrhage is least with laparoscopic approach but injury to surrounding organs is probably greater\(^{(24)}\). In hysterectomy due to benign disease the complication rate was found to be 24.2%, while those with malignant disease presented a two folds complication rate. Operations due to benign disease had a 0.2% mortality rate, while those with malignant aetiology rate 2.960%\(^{(25)}\).

**Bladder injury:**

It occurs in about 1% of all hysterectomy cases. With the abdominal approach this is most likely to occur as the peritoneum is opened or during dissection of the bladder from the lower uterine segment. Scarring increases the risk of injury and likelihood of these complication. Similarly during vaginal hysterectomy, cystotomy is more likely to occur as the bladder is dissected off the lower uterine segment. Sharp dissection is the midline should minimize the chance of injury. If there is the question of a small cystotomy, infusion of sterile milk or methylene blue dye into the bladder may aid in localizing the site of the cystotomy. If the cystotomy dose not involve the bladder trigone a two-layer closer with 3-0 absorbable suture is generally easy to perform. The catheter is left in for 3---4 days post-operatively, or at least until any gross haematoma has resolved\(^{(6)}\).

Harris WJ claimed that, many vesicovaginal fistulae develop from an unsuspected bladder injury. It is recommended that, after a difficult dissection, the bladder be distended with fluid or dye solution to rule out such an injury\(^{(26)}\).

**Ureteral injury:**

Ureteral damage occurs in approximately 5% of cases. The most likely sites of ureteral injury are, at the level of the infundibulopelvic ligament, at
the level of the uterine artery and at the uterovesical junction. Risk of injury in abdominal cases can be decreased by opening the retroperitoneum to allow direct visualization of the ureter during its course through the pelvis.

During vaginal hysterectomy the ureter is generally palpable. Risk of injury is minimized by placement of the clamps very close to the cervix and by retracting the bladder out of the operative field. Cystoscopy evaluation is easily performed to evaluation ureteral patency at end the of the case. Stents may be placed retrograde if necessary\(^\text{(6)}\).

The essential point is to recognize urologic injuries and correct them intra-operatively, avoiding the serious postoperative complication, that occur from urinary extra-vasation\(^\text{(1)}\).

Sheikh N, and others claimed that, bleeding is a common problem that attends pelvic procedure, and can lead to ureteral injury. Direct pressure can control most bleeding. The ureter and the bleeding point are positively identified before suturing or cauterizing, to ensure haemostasis without ureteral damage\(^\text{(27)}\).

**Gasterointestinal injury:**

Small bowel complication occur most commonly during abdominal hysterectomy as the abdominal wall is opened. A small laceration may be closed in layers, with 3---0 absorbable suture to approximate the mucosa and are enforcing serosal closure with interrupted 3---0 silk sutures. The laceration should be closed transversely to avoid narrowing the intestinal lumen.

Laceration of the rectum occurs more commonly during vaginal hysterectomy. A small laceration may be repaired with a simple two layer closure. The patient should be placed on a broad spectrum antibiotic. In the case of a large laceration, a diverting colostomy may be necessary.

**Haemorrhage:**

Early post-operative bleeding may present as overt vaginal bleeding or as deteriorating vital sings with a falling haematocrit. Vaginal bleeding is often a
sign of cuff bleeding, which may be controlled by suturing the bleeding sites through a vaginal approach. The second scenario generally indicates intra-peritoneal or retroperitoneal bleeding. This situation warrants abdominal exploration after the patient is stabilized. All pedicles, the vaginal cuff and the retroperitoneum should be carefully examined to determine the source of bleeding. Interventional radiology has been used to isolate and occlude bleeding vessels.

**Post-operative fever:**

A patient who develops postoperative febrile morbidity should be completely evaluated. Pulmonary causes may be atelectasis, pneumonia or embolus. The extremities are evaluated for the possibility of thrombophlebitis. Urine analysis should be obtained and an intravenous pyelogram considered if there is concern about ureteral injury. An abdominal incision, if present, is inspected for erythema or the presence of a subcutaneous mass. A rectovaginal examination must be performed to check for the presence of a cuff haematoma or abscess. Cuff cellulites generally begins on about postoperative day 3. If this is the presumptive diagnosis remains elusive, pelvic ultrasound may be helpful to diagnose the presence of a pelvic collection.

The decrease in febrile morbidity after vaginal hysterectomy with the use of prophylactic antibiotics is well documented. The use of a single-doses cephalosporin is efficacious and has become the standard of care. If the procedure last 3 hours or more, an additional dose of antibiotic may be beneficial (6). However, Hemsell DL, stated that antimicrobial prophylaxis for vaginal hysterectomy is generally indicated, whereas for abdominal hysterectomy, it should be reserved for patients at high risk for infection (28).
**Vault prolapse:**

Vault prolapse is a rare complication of both abdominal and vaginal hysterectomy. Attention to the support of the vault during the hysterectomy should decrease the risk of subsequent vault prolapse. The vault should be suspended from the uterosacral ligament complex if these structure are of adequate strength. In addition, a culdoplasty may be performed at the time of the vaginal hysterectomy, and a Moschcowitz procedure can obliterate the cul-de-sac during an abdominal hysterectomy. If no adequate ligament supports are present, a primary colpopexy should be considered (1).

Martin, -X and this colleges found in their study which, was carried out in France, that morbidity was very low and the same for both abdominal and vaginal route: 1.8% operative accidence (mainly bladder wounds), 1% re-operation, only one case of thrombo-embolism and less than 0.5% postoperative fever (29). However, Kovac, -S-R stated that vaginal approach to hysterectomy is associated with less pain, fewer complications, lower hospital charges, a shorter length of hospital stay, and more rapid convalescence compared with abdominal hysterectomy (30).

Lowell ,-l, and Kesseler,A-A stated that, LAVH offers benefits to patients in the form of less time in the hospital and presumably, therefore, faster recovery, through at the expense of potentially longer intra-operative time, increased risk of blood transfusion and 00 increased risk of intra-operative complication (31). However, Falcone, -T et al concluded that LAVH appears to allow patients amore rapid postoperative recovery and an earlier return to work with hospital costs similar to those of abdominal hysterectomy (32).

Kim YB, and colleagues reported that the incidence of disruption of a suture line (dehiscence) ranges from 0.28% to 0.51% for abdominal hysterectomy. Obesity, anaemia vertical incision, and medical disorders
(diabetes and renal) are all risk factors. Closure of a vertical incision should utilize the Smead-Jones technique with a non-absorbable suture\textsuperscript{(33)}.

2-5: \textit{Abdominal Hysterectomy Versus Vaginal Hysterectomy:}

There are distinct advantages to the patient when the hysterectomy can be done vaginally, rather than abdominally.

1- Vaginal hysterectomy is an almost entirely extra-peritoneal operation. The peritoneum is opened to only a minimal extent and little packing of the intestines away from the operative field is necessary. Because there is less manipulation of the intestines, postoperative ileus is much less common than with abdominal hysterectomy.

2- With vaginal hysterectomy, the morbidity associated with making an abdominal incision (e.g., infection, dehiscence, evisceration, discomfort, or hernia) is avoided. Patients are pleased not to have a scar on the abdomen. Avoidance of an abdominal incision also reduces the depth and length of anesthesia.

3- Postoperatively, patients are able to ambulate earlier and better and to care for themselves. The need for nursing care is reduced. Bowel function returns sooner, patients can be fed sooner and parenteral fluid therapy is minimized. There is less interference with pulmonary function. The incidence of postoperative infectious morbidity is less than half that of abdominal hysterectomy, and the need for postoperative antibiotics is reduced. The need for the postoperative pain medication is reduced. Vaginal hysterectomy patients are generally discharged from the hospital earlier.

4- Fewer postoperative adhesion develop after vaginal hysterectomy.

5- Vaginal hysterectomy is better tolerated by elderly patients and those with complicating medical diseases.
6- Extreme obesity increases the technical difficulties of both abdominal and vaginal hysterectomy, but technical difficulties are less with vaginal hysterectomy.

7- Needed repair of vaginal wall relaxation is easier with vaginal hysterectomy\(^{(13)}\).

2-6: Physical Aspects of Hysterectomy:

**What to expect in hospital:**

Normally women are admitted to hospital the day before the operation and routine pre-operative procedures and investigations are performed including, small enema to ensure that the bowel is empty before the operation, and a pubic shave performed by either the woman herself or her nurse. In some hospitals, women are measured for special support( anti-embolism) stockings which help prevent deep vein thrombosis\(^{(1)}\).

Before proceeding with surgery, the physician is obligated to obtain an informed consent from the patient. The risks and benefits of the procedure must be discussed with and understood by the patient. All risks should be addressed including the remote possibility of death. With regard to hysterectomy the most common complications are bleeding, infections and injuries to gastrointestinal or urinary tract. Alternatives to hysterectomy should also be included in the discussion.

A thorough history and physical examination are prerequisites to any surgery.

A recent Papanicolaou stain test, complete blood count, and typing and screening should be obtained in all cases. Pregnancy should be ruled out when it is a possibility. Other laboratory evaluations are ordered on a case-by-case basis, depending on the patient,s age, medical history , and current medications. Pelvic ultrasound is the preferred imaging modality for most pelvic masses. Endometrial sampling should be part of the preoperative
evaluation of any patient over the age of 35 years with abnormal uterine bleeding.

Blood loss is a potential consequence of any surgery, and the possible need for transfusion should be discussed\(^{(6)}\).

**After the operation:**

Surgery takes approximately 45 minutes and the woman should be warned that she will wake up in the recovery room rather than on the ward. She will often require oxygen for a while to help disperse the anaesthetic gases. She will usually have an intravenous infusion which will stay in for 24-48 hours and occasionally a blood transfusion in the case of severe blood loss during surgery. A urinary (Foley) catheter might be present and a Redivac drain will be protruding from a point near the incision site. This drain has a vacuum and removes excess blood from the wound to prevent a haematoma. Women who have had a vaginal hysterectomy will have a vaginal pack (a length of ribbon gauze soaked in Proflavin antiseptic cream) which is inserted in the vagina rather like a large tampon, instead of a Redivac drain. In some cases of vaginal hysterectomy a supra-pubic catheter is used instead of a urethral catheter. This is inserted via the abdomen and is thought to reduce the risk of post-operative urinary tract infection.

Pain relief will be given by injection e.g Pethidine, or Nopain or Morphin Sulphate. Diclofenac Sodium (Voltarol) suppositories are frequently used for their anti-inflammatory and excellent analgesic properties. In some hospitals epidurals are available for hysterectomy patients or patient controlled analgesia (PCA)pumps which allow the patients their own pain relief.

Injections of Prochlorperazine (Stemetil) or Metacloperamide (Maxolon) may be given for nausea. Although not always successful, the aroma of peppermint oil can allay vomiting (Tisserand,1988) a few drops may be placed on a tissue on the patient pillow or wise (1989) recommends
using one drop of peppermint oil in water to make a refreshing mouth wash. Wise (1989) also recommends placing bowls of hot water containing essential oils near the beds of patients who have just returned from theatre to promote deep breathing.

**The next few days:**

The following day the woman will be encouraged to sit out of bed for a short while and a physiotherapist may visit to encourage leg exercises, pelvic rocking and deep breathing.

When bowel sounds are heard, the woman can start sipping water and gradually progress to light food. Her intravenous infusion will then be removed. A urinary catheter, if present, will be removed and fluid intake and urinary output measured. Sometimes women contact urinary tract infections following hysterectomy and these will be treated with antibiotics. It is important that the woman empties her bladder fully and squeezes out the last few drops.

The Redivac drain is removed when drainage is minimal and although not very painful, this will feel like a sharp tugging sensation which last for a few seconds.

By the second day following surgery the woman is usually able to walk to the bathroom without too much discomfort. Oral analgesic are now given as well as Voltarol suppositories. Women may worry about bursting their stitches and need reassurance that this is not possible since there are several strong layers beneath the skin. The stitches are usually removed on the fifth day for a horizontal wound and in the seventh to tenth day for a vertical incision.

Many women experience griping (wind pain) after the operation which can cause considerable discomfort. Hot peppermint water sipped slowly may help, and some doctors use enteric-coated peppermint oil capsules (Clopermin) which are excellent.
Walking around and sitting in a warm bath may also help. Constipation can be a problem and Glycerine suppositories, Lactulose syrup, Fybogel or Senocket are all remedies that can be offered.

It is very common for women to feel blue on the third or fourth day following surgery and many women find themselves in tears for no apparent reason. They should be reassured that this is a normal action and will pass, although some women do experience similar feelings again on leaving hospital. Hormonal replacement therapy will help many women, particularly those who are peri-menopausal and those who have had a bilateral salpingo-oophorectomy, but there may be more subtle reasons for their feeling of depression (1).

2-7: Psychological Aspects of Hysterectomy:

All major surgery has implications for an altered body image but the removal of a uterus can alter a woman's self-image and essentially her perceived femininity. The uterus is a symbol of reproduction and without it and associated menstruation, a woman may well feel she is not a sexual being.

To many women the suggestion of having a hysterectomy provokes fear and horrors due to the misconceptions and old wives tales surrounding this particular operation. In fact the ancient Greekes believed the uterus (hystero) to be the source of all emotions; hence the word hysteria, and hysterectomy.

Studies have reported high levels of psychological problems both pre- and post-operatively. This higher than expected.

Level of psychopathology is mirrored in gynaecology outpatient clinics (Worsley et al, 1970) and therefore hysterectomy patients should be seen as a vulnerable group.

Women have often heard from relatives and friends prophesies of doom which make them wonder if a hysterectomy will cause them to grow hair on
their face, gain weight, become unattractive to their husbands and, above all loose all their own desires and feelings of pleasure. Some mistakenly believe that the vagina is sewn up at the vulva, and others think that a uterus is necessary for orgasm.

Naturally the role of the nurse is of utmost importance, to uncover anxieties and fears, to correct any myths and misconceptions and to give clear, accurate advice. Unfortunately, instead of the detailed information women require, they are only given brief hints about not lifting and important concerns such as when to resume sexual activity are neglected. Kreuger et al, (1979) reported that nurses volunteered little information to patients and were slow to initiate discussion which patient would have found helpful, particularly about sexual adjustment. Webb (1985) in her study of gynaecology nurses, found that although nurses did talk to their patients and were aware that hysterectomy patients feared losing their womanhood they interpreted this as referring only to patients, sex lives and not to the wider aspects of sexuality, self-concept and self-esteem.

Some women do not realize they will no longer have periods following a hysterectomy, and in pre-menopausal women the cessation of menses and loss of fertility must be addressed and accurate information about HRT given. Those women who suffer from premenstrual syndrome and think that a hysterectomy will cure this problem may well find that cyclical symptoms persist following hysterectomy if the ovaries have been conserved, leading to the term "ovarian cycle syndrome" (Backstrom et al. 1981). The complication of oophorectomy can also be misunderstood and Williamson (1992) comments that some women believe that they will die at an earlier age if their ovaries are surgically removed.

Certain ethnic groups find hysterectomy particularly hard to accept and nurses should be aware of the impact this operation may have on different cultures and communities. West Indian women view menstruation as a
cleansing act, riding the body of impurities and are reluctant to have a hysterectomy. Some also fear they will be "less of women" in the eyes of their men, who may be tempted to look for another "whole women". For this reason they may not wish their partner or family to know exactly what operation they are having, and all staff should respect their right to confidentiality.

The cultural role of Muslim women is dependent on their fertility and, again it may be difficult for both partners to come to terms with surgery. It can be of enormous value if you find time for discussion about impending surgery, not only with the patient but also with her partner and other members of the family.

Shingleton and Orr (1987) provide an ideal framework for you to begin discussing any sexual concerns with your patients. Numerous authors experienced by women following gynaecological surgery have shown that proper information and counseling could alleviate many of the problems.

Question to open up discussion of sexual anxieties following hysterectomy:
- What does your uterus mean to you?
- How will hysterectomy change your life?
- What is the most important function of your uterus

Williams (1986) revealed that women wanted specific advice to aid recovery and this was frequently lacking. Gould (1986) found that all the women in her study stated spontaneously that they were glad of the opportunity to talk to the researcher about their experiences and feeling, indicating an unmet need and lack of support by hospital staff. In Gould's (1986) study, ward nurses of ten expressed surprise that women's recovery from hysterectomy should be a topic worthy of investigation in view of it's routine nature and apparent lack of problems. Careful documentation of
events after discharge from hospital suggested that many problems did in fact, exist, and women would have worried less if they had been adequately prepared.

Discharge advice following hysterectomy and other major gynaecological surgery:

Women normally stay in hospital for 5--10 days following major gynaecological surgery, and they should be encouraged to go home when they feel ready to do so. Unfortunately, pressure on hospital beds means discharge is often too early.

It is important that the whole family, particularly the women's partner, understood what she can and can not do whilst she is recovering at home. Women should be given a discharge advice or a counseling session with an opportunity to ask question and this should be backed up by written specific information, such as the "Hysterectomy Hand-Out" (the Professional Nurse October 1989) with an assurance that she can ring the ward for advice at any time.

**Bleeding:** there may be a vaginal discharge for up to four weeks which will turn from red to a pale brown colour. If it becomes heavier, brighter in colour or offensive smell medical advice should be sought.

**Resting:** it is important that the women should rest sufficiently during the first two weeks and go to bed when she feels tired.

**Exercise:** it is important and any exercises taught at hospital should be continued at home.

**Housework:** no housework should be performed for the first two weeks. It is very important to avoid lifting any thing heavy for the first four weeks and very heavy items for at least three months. When any thing is lifted it is important to remind the women to bend her knees, keep her back straight and the object close to her. This avoid straining her abdomen.
**Diet:** it is advisable to eat a variety of foods, including fresh fruit and vegetables to avoid constipation.

**Work:** some women feel able to return to work 6---8 weeks following surgery, while others may feel the need to take another 6---8 weeks off. Obviously some jobs are more strenuous than others women should judge for themselves when they feel ready.

**Sexual intercourse:** general speaking it takes about six weeks to feel both physically and emotionally ready to resume love-making after major gynaecological surgery, and most gynaecologists recommend this time interval before attempting intercourse\(^1\).
OBJECTIVES

1- To determine the different indications for each route.

2- To determine the safety of vaginal hysterectomy in comparison with abdominal hysterectomy.

3- To study the effectiveness of each route in terms of, operating time and postoperative hospital stay.
CHAPTER TWO
**PATIENTS & METHODS**

This is a prospective, comparative study conducted in Khartoum Teaching Hospital (KTH) in a period of six months, from August 2003 to January 2004.

KTH is the biggest hospital in Sudan. It contains almost all medical specialties, and it receives patients from the city and the surrounding towns and villages as well as referred patients from all over the Sudan.

The department of obstetrics and gynaecology consist of about six units, it is run by a staff from University of Khartoum in addition to other staff from Ministry of Health. The staff members of each unit comprise, one or more senior consultant obstetrician, and at least two junior obstetrician. The department is well staffed by registrars, and other junior staff with satisfactory facilities available.

There are six obstetrics and gynaecological referred clinics. They are attended by the consultants, the registrars and the house officers, in addition there is a family planning clinic.

There are two rooms in the general theatre for elective obstetrics and gynaecological cases beside the theatre in the casualty for emergency cases.

Blood bank facilities are available for 24 hours.

KTH plays a major role in teaching and training of registrars, house officers, medical students and nurses.

A total of 60 women, represent those who arrived at the theatre in that period for elective hysterectomy, were included in the study after a verbal consent. No specific criteria were followed to select these patients. 40 underwent abdominal hysterectomy and 20 underwent vaginal hysterectomy.

For each patient a history was taken, a clinical examination was done, and the results of investigation were reviewed. Those patients who entered the theatre were well prepared, and each had at least two units of screened and cross-matched blood, saved in the blood bank.
A questionnaire was designed, and was started to be filled preoperatively, by reviewing the indication of operation from the patients primary preoperative records "taking in consideration that the indication was made by consultant.

The policy of the hospital is to give a dose of intravenous prophylactic cephalosporin half an hour before induction of anaesthesia. The majority of operation were done under general anaesthesia with a few exceptional cases under spinal anaesthesia.

The choice of abdominal incision depends on the size of the uterus and the nature of the disease, if the uterus is large or malignancy or adhesions were suspected, a sub-umblical midline vertical incision was done, otherwise a supra-pubic transverse (Pfennenstiel) incision is the choice.

The majority of operation were done by consultants, the remainder were done by senior registrars under supervision of consultants.

The technique used for vaginal hysterectomy is lash modified technique, beside other techniques used in exceptional cases.

We closely followed every operation and the following variables were recorded:

- Operating time, calculated from beginning of the surgical procedure until it's end.
- Intra-operative visceral injuries.
- Bleeding and need of blood transfusion.
- Any other complications.

Then the patient were regularly followed in the ward for their postoperative hospital stay, during which the rest of the questionnaire was filled regarding, postoperative complications e.g fever, urinary problems, infection, haemorrhage,… etc. and lastly the duration of postoperative hospital stay was calculated in days.
The results of the different variables were analyzed by t test, and were presented in tables and figures. A difference was considered statistically significant at P value <0.05.
CHAPTER THREE
RESULTS

Table 1 & 2:

Shows the demographic characteristics of study population.

The mean age of the patients underwent abdominal hysterectomy was 50 ± 10.86 years, while that for patients underwent vaginal hysterectomy was 57 ± 10.62 years. The difference was statistically significant, P=0.016.

The mean weight of cases of abdominal hysterectomy was almost equal to that of cases of vaginal hysterectomy (87.45 ± 8.58 & 87 ± 9.3) kg consecutively, therefore the difference is statistically insignificant.

Ten percent of women underwent abdominal hysterectomy were nulliparous, while all those who underwent vaginal hysterectomy were nulliparous, this is statistically significant, P=47.5% of cases of abdominal hysterectomy were pre-menopause while 30% of cases of vaginal hysterectomy were pre-menopause, this difference is statistically significant, P=0.045.

Table 3:

Compared the different indications for abdominal and vaginal hysterectomies.

Indications for which the difference was statistically significant were:

Cystocele/Rectocele & Uterine Prolapse while were not found as indications for abdominal hysterectomy, they were responsible for 85% of preoperative indications for vaginal hysterectomy P=0.000.

Leiomyoma & Malignant Pathology, they were responsible for 40% of indications for abdominal hysterectomy, however, they were not found as indications in cases of vaginal hysterectomy P=0.032 for each.

Table 4:

Shows intra-operative complications encountered during abdominal and vaginal hysterectomy.
Fifty seven percent of patients underwent abdominal hysterectomy had required intra-operative blood transfusion while only 25% required blood during vaginal operations P=0.017.

only two cases of abdominal hysterectomy experienced visceral injury during operation. The difference is statistically significant

**TABLE 5:**

Shows postoperative complications in abdominal and vaginal hysterectomy.

Febrile morbidity had occurred more frequently (in 12 cases out of 20) following vaginal hysterectomy, but less frequently (11 cases out of 40), this difference was significant P=0.014.

Other postoperative complications e.g bleeding, urinary problems, and wound infection had occurred less frequently following vaginal hysterectomy but the difference was statistically significant.

**TABLE 6:**

Compared the operating time (mins) and the duration of postoperative hospital stay (days).

For abdominal hysterectomy the mean operating time was 105 + 29.7 while that for vaginal hysterectomy was 75 + 25.8. The difference was statistically significant.

The mean duration of postoperative hospital stay following abdominal hysterectomy was 150.3 + 23.5 whereas that following vaginal hysterectomy 111.6+11, these differ significantly P=0.000.

**TABLE 7:**

Compared the results of post-operative investigations.

In cases of abdominal hysterectomy the average Hb. Level was 64+10.99, while that in cases of vaginal hysterectomy was 73.35+8.29. This difference was statistically significant P=0.002
Seven patients out of 40 for whom abdominal hysterectomy was carried out developed post-operative urinary tract infection, while 8 patients out of 20 developed this complication following vaginal hysterectomy. The difference was not significant.

**(FIG. 1):**

Shows distribution of age group among study population.

- **Abdominal hysterectomy**: age group (< 40) 17.5%, (40--<50) 40%, (50--<60) 20%, (>60) 22.5%.
- **Vaginal hysterectomy**: age group (< 40) 10%, (40--<50) 5%, (50--<60) 25%, (> or = 60) 50%.

**(FIG. 2):**

Shows different modalities of abdominal hysterectomy.

- 65.5% underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy,
- 27.5% subtotal hysterectomy,
- 7.5% total abdominal hysterectomy without salpingo-oophorectomy,
- and the remaining 2.5% radical hysterectomy.

**(FIG. 3):**

Shows different modalities of vaginal hysterectomy.

Vaginal hysterectomy without salpingo-oophorectomy was only modality performed in all cases. Vaginal hysterectomy with vaginal repair was performed in 45% of cases.

**(FIG. 4):**

Shows number of units in cases needed intra-operative blood transfusion.

- During abdominal hysterectomy, 5% received 3 units, 30% received 2 units and 22.5% received one unit.
- During vaginal hysterectomy, 5% received 2 units and 20% received one unit.
(FIG. 5):

Shows educational status of cases of abdominal hysterectomy.
Fifty four percent were illiterate.
Thirty eight percent primary school.
Eight percent secondary school.

(FIG. 6):

Shows educational status of cases of vaginal hysterectomy.
Eighty percent were illiterate.
Twenty percent primary school.
**TABLE I:**

**Demographic Characteristic Of Study Population**

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<th>Characteristic</th>
<th>Abdominal</th>
<th>Vaginal</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>50 ± 10.86</td>
<td>57.3 ± 10.62</td>
<td>0.016</td>
</tr>
<tr>
<td>Weight (K.G)</td>
<td>87.45 ± 8.58</td>
<td>87 ± 9.3</td>
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</tbody>
</table>

* Values are expressed as average ± SD.

* NS indicates not significant.
**TABLE 2:**

*Demographic Characteristic Of Study Population*

<table>
<thead>
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<th>Characteristic</th>
<th>Type of Hysterectomy</th>
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<td>Abdominal</td>
</tr>
<tr>
<td>Nulliparity / Multiparity %</td>
<td>10/90</td>
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<tr>
<td>Pre / Postmenopause %</td>
<td>47.5/42.5</td>
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</table>

* NS indicates not significant.
**TABLE 3:**

*Indications For Abdominal And Vaginal Hysterectomy*

<table>
<thead>
<tr>
<th>Indication</th>
<th>Type of Hysterectomy</th>
</tr>
</thead>
<tbody>
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<td>Abdominal</td>
</tr>
<tr>
<td>Cystocele / Rectocele n (%)</td>
<td>0</td>
</tr>
<tr>
<td>Uterine prolapse n (%)</td>
<td>0</td>
</tr>
<tr>
<td>Menorrhagia / Metrorrhagia n (%)</td>
<td>6 (15)</td>
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<td>Endometrial hyperplasia n (%)</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Malignant pathology n (%)</td>
<td>8 (20)</td>
</tr>
<tr>
<td>Adenexal mass n (%)</td>
<td>5 (12.5)</td>
</tr>
<tr>
<td>Chronic pelvic pain n (%)</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Leiomyoma n (%)</td>
<td>8 (20)</td>
</tr>
<tr>
<td>Others n (%)</td>
<td>7 (17.5)</td>
</tr>
</tbody>
</table>

* NS indicates not significant.
**TABLE 4:**

*Intra-operative Complications*

<table>
<thead>
<tr>
<th>complication</th>
<th>Type of Hysterectomy</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Abdominal</td>
<td>Vaginal</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Intra-operative blood transfusion n (%)</td>
<td>23 (57.5)</td>
<td>5 (25)</td>
<td>0.017</td>
<td></td>
</tr>
<tr>
<td>Intra-operative visceral injury n (%)</td>
<td>2 (5)</td>
<td>0</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

* NS indicates not significant.
### TABLE 5:

*Postoperative Complication For Abdominal And Vaginal Hysterectomy*

<table>
<thead>
<tr>
<th>Complication</th>
<th>Abdominal (n, %)</th>
<th>Vaginal (n, %)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding (%)</td>
<td>3 (7.5)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Urinary problems (%)</td>
<td>8 (20)</td>
<td>9 (45)</td>
<td>NS</td>
</tr>
<tr>
<td>Fever (%)</td>
<td>11 (27.5)</td>
<td>12 (60)</td>
<td>0.014</td>
</tr>
<tr>
<td>D.V.T (%)</td>
<td>0</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Wound infection (%)</td>
<td>3 (7.5)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Death (%)</td>
<td>0</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>others (%)</td>
<td>0</td>
<td>0</td>
<td>NS</td>
</tr>
</tbody>
</table>

* NS indicates not significant.
<table>
<thead>
<tr>
<th>Type of Hysterectomy</th>
<th>Abdominal</th>
<th>Vaginal</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating time (mint.)</td>
<td>105 ± 29.7</td>
<td>75 ± 25.8</td>
<td>NS</td>
</tr>
<tr>
<td>Duration of postoperative hospital stay (hours)</td>
<td>150.3 ± 23.5</td>
<td>111.6 ± 11</td>
<td>0.000</td>
</tr>
</tbody>
</table>

* Values are expressed as average ± SD.

* NS indicates not significant.
**TABLE 7:**

*Postoperative Investigations*

<table>
<thead>
<tr>
<th>investigation</th>
<th>Abdominal</th>
<th>Vaginal</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb %</td>
<td>64.45 ± 10.99</td>
<td>73.35 ± 8.29</td>
<td>0.002</td>
</tr>
<tr>
<td>Urinary Tract Infection n (%)</td>
<td>7 (17.5)</td>
<td>8 (40)</td>
<td>NS</td>
</tr>
<tr>
<td>others</td>
<td>0</td>
<td>0</td>
<td>NS</td>
</tr>
</tbody>
</table>

* NS indicates not significant.
(FIG. I):

Distribution Of Age Group Among Study Population
(FIG. 2):

Modalities Of Abdominal Hysterectomy
**FIG (3):**

*Modalities Of Vaginal Hysterectomy*

- VH+VR: 45.00%
- VH-VR: 55%
- VH+BSO: 0%

*Modality of Vaginal Hysterectomy*
(FIG. 4):

**Number Of Blood Units In Cases Needed Intra-operative Transfusion**

![Bar chart showing number of blood units needed intra-operatively for vag.hys and abd.hys procedures.]
(FIG. 5):

Educational Status Of Cases Of Abdominal Hysterectomy
(FIG. 6):

Educational Status Of Cases Of Vaginal Hysterectomy

- 16.80% illiterate
- 80% with primary school education
- 4.20% with primary school education
CHAPTER FOUR
DISCUSSION

The evaluation of our data shows that the average age among the patients undergoing abdominal hysterectomy was 50 years, which closely corresponds to that shown in a similar study carried out in Almada, Portugal,\(^\text{(34)}\) which was found to be 49 years; and that of the patients underwent vaginal hysterectomy in the same study was 54 years which is not far from ours, 57 years.

Fifty four percent of the patients who underwent abdominal hysterectomy, and 80% of those underwent vaginal hysterectomy were illiterate, this agrees with Mars NF, and his colleagues who stated that the higher the educational status, the lower the hysterectomy rate, and vice versa \(^\text{(35)}\).

Regarding the parity, of the abdominal hysterectomy cases 15% were nulliparous and 85% were multiparous, however, all vaginal hysterectomy operations in our study were carried out in multiparous women.

Total abdominal hysterectomy with bilateral salpingo-oophorectomy was the commonest modality done through the abdomen, this agrees with my colleague Ibtisam Abdu \(^\text{(36)}\) who reported the same finding in a thesis carried out five years ago in police teaching hospital.

This may be explained by the fact that most of our patients were either post-menopausal or there was suspicious of malignancy, however, Zalel Y, et al. stated that prophylactic removal of healthy ovaries for cancer prophylaxis is not universally accepted, even in older women \(^\text{(37)}\). On the other hand the commonest modality performed through the vagina was found to be a hysterectomy without salpingo-oophorectomy, this may be an indicator of our low experience with the adenexal mass removal by the vaginal route. Accompanied repair was done in 45% of cases, and this is considered as an advantage of vaginal hysterectomy upon abdominal one.

The average weight was almost equal in the two groups of study population.
Regarding the indications, leiomyoma and malignant pathology were found to be the commonest indications for abdominal hysterectomy, however none of them was reported as an indication in cases of vaginal hysterectomy instead the vast majority were done either for uterine prolapse or vaginal wall prolapse, this finding may consolidate our previous suggestion; that we have less experience with the vaginal hysterectomy technique.

Twenty three cases out of 40 required blood transfusion during abdominal hysterectomy, whereas only five out of 20 were transfused during vaginal hysterectomy this could be explained by our finding that leiomyoma and malignant pathology were the commonest indications for abdominal hysterectomy. However, in either case the rate was higher than that reported by Ng SP. (4.7%)\(^{(38)}\) and Cova EF. (2.9%)\(^{(39)}\).

Intra-operatively, only two cases of visceral injuries were reported during abdominal procedure, one of them was bladder perforation during radical hysterectomy and the other was small bowel injury during total hysterectomy, both of them were noticed immediately and repaired without adverse outcomes. On the other hand no visceral injury had occurred during vaginal approach, however, these antagonize the results reported by Colaco et al.\(^{(34)}\) who found 4% of visceral injury during vaginal approach and 2% during abdominal approach, the explanation may be that they use the vaginal route even for cases with malignant pathology or adhesions.

Post-operative febrile morbidity and urinary tract infections had occurred more commonly during vaginal hysterectomy than during abdominal hysterectomy, while other complications e.g. haemorrhagic event and wound infections had occurred more frequently with the abdominal route, this agrees with Michel e. Rivilin who claimed that the vaginal route is associated with a shorter and more comfortable recovery but a higher incidence of febrile morbidity than the abdominal procedure\(^{(2)}\).
According to our results, the average operative time for abdominal hysterectomy was 105 minutes versus 75 minutes for vaginal hysterectomy, these are more or less comparable to those reported by Colac et al (34) who found the average as 102 minutes and 84 minutes consecutively.

The average duration of post-operative hospital stay was found to be 150 hours for cases of abdominal hysterectomy compared with 111 hours for cases of vaginal hysterectomy, however, the difference was statistically highly significant and this carries social and financial consequences.

Of the post-operative investigations done to the study population the average haemoglobin level was found to be 64% for cases underwent abdominal hysterectomy, and it was significantly lower than that of the patients underwent vaginal hysterectomy which was 73%. This may be attributable to the variations in the pre-operative indications and intra- and post-operative complications in each method.
CONCLUSION

According to our study, the commonest type of hysterectomy in KTH, were total abdominal hysterectomy with bilateral salpingo-oophorectomy through the abdominal and vaginal route consecutively. No laparoscopic hysterectomy had been performed during this period.

The commonest indications were leiomyoma and malignant pathology in cases of vaginal hysterectomy, and genital prolapse in cases of vaginal hysterectomy.

The average operative time was 105 mint. for abdominal approach and 75 mint. for vaginal approach.

The most commonly encountered intra-operative complication was haemorrhage that necessitated blood transfusion in about 57% of abdominal operations and 25% of vaginal operation.

Febrile morbidity was found to be associated most commonly with vaginal hysterectomy. No serious morbidity had been reported, and there were no deaths attributed to these operations.

The average duration of postoperative hospital stay was 150 days for cases of abdominal hysterectomy and 111 days for cases of vaginal hysterectomy.

On discharge the average haemoglobin level for patients underwent abdominal hysterectomy was 65% and 73% for those underwent vaginal hysterectomy.

It became clear that vaginal hysterectomy is more safer, carries less short term complications, and cost effective compared with abdominal hysterectomy.
RECOMMENDATIONS

- As hysterectomy is a major operations and it carries all the risks of surgical intervention, it should be done only for a solid indication, or after failure of other conservative alternative.

- Early and proper pre-operative preparation specially correction of anaemia in order to reduce the rate of blood transfusion and its associated complications.

- To increase the trends toward vaginal hysterectomy, so as to decrease postoperative morbidity and duration of hospital stay.

- Prophylactic removal of healthy ovaries should be discouraged specially in pre-menopausal women.

- Further researches to study the hormonal and psychological long-team sequels hysterectomy.

- Laparoscopically assisted vaginal hysterectomy proved to be cost effective both for hospital and patients, therefore its use must be encouraged following appropriate training.
REFERENCES


