View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by ePrints@TNMGRM (Tamil Nadu Dr. M.G.R. Medical University)

# THE COMBINED ROLE OF TRANSVAGINAL SONOGRAM AND ASPIRATION CYTOLOGY OF ENDOMETRIUM IN POST MENOPAUSAL UTERINE BLEEDING – A PROSPECTIVE STUDY

*Dissertation Submitted to*

**THE TAMIL NADU DR. M.G.R MEDICAL UNIVERSITY**

*In partial fulfillment of the regulations*
*for the award of the degree of*

## M.D. (BRANCH – II)
## OBSTETRICS & GYNAECOLOGY


**GOVT. KASTURBHA GANDHI HOSPITAL FOR WOMEN AND CHILDREN, MADRAS MEDICAL COLLEGE , CHENNAI**
**THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY**
**CHENNAI, INDIA.**

**SEPTEMBER 2006**

# CERTIFICATE

This is to certify that this dissertation entitled A PROSPECTIVE STUDY ANALYSING THE COMBINED ROLE OF TRANSVAGINAL ULTRASONOGRAM AND ASPIRATION CYTOLOGY OF ENDOMETRIUM IN POST MENOPAUSAL UTERINE BLEEDING is a bonafide work done by Dr Punithavathi P, post graduate in M.D (OBSTETRICS & GYNACOLOGY) under my guidance and supervision at Govt Kasturbha Gandhi Hospital, Madras Medical college, Chennai in partial fulfillment of regulation of Tamilnadu Dr.M.G.R Medical University for the award of M.D Degree in Obstetrics and Gynaecology in September 2006

**Prof Dr.S.Dhanalakshmi. M.D, D.G.O, M.N.A.M.S,**
Superintendent,
Govt Kasturbha Gandhi Hopital for Women and Children,
Triplicane, Chennai .

**Prof Dr.V.Madhini M.D., D.G.O., M.N.A.M.S.,**
Director,
Institute of Obstetrics and Gynaecology,
Egmore, Chennai
Head of the Department of Obstetrics and Gynaecology,
Madras Medical College.

**Dr. Kalavathy Ponniraivan B.Sc., M.D.,**
DEAN,
Madras Medical College,
Chennai.

# DECLARATION

I, **DR.P.PUNITHAVATHI,** solemnly declare that dissertation titled **"THE COMBINED ROLE OF TRANSVAGINAL SONOGRAM AND ASPIRATION CYTOLOGY OF ENDOMETRIUM IN POST MENOPAUSAL BLEEDING"** is a bonafide work done by me at Govt. Kasturbha Gandhi Hospital, Madras Medical College,Chennai during 2003-2006 under guidance and supervision of **Prof.Dr.S.Dhanalakshmi M.D., D.G.O., M.N.A.M.S**., Superintendent, Govt Kasturbha Gandhi Hospital, Chennai.

This dissertation is submitted to Tamilnadu DR. M.G.R Medical University, towards partial fulfillment of requirement for the award of **M.D. Degree (Branch – II) in Obstetrics & Gynaecology.**

Place: Chennai.

Date:

**DR.P.PUNITHAVATHI**

# ACKNOWLEDGEMENT

I sincerely thank Prof. Dr. Kalavathy Ponniraivan .B.Sc., M.D.Dean, Madras Medical college Chennai for granting me permission to use the facilities of the institution and hospital for this study.

I express my gratitude and thanks to Prof. Dr. V. Madhini, M.D.D.G.O., M.N.A.M.S., Director, Institute of Obstetrics and Gynaecology, Chennai for her guidance

I am greatly indebted to Dr, S.Dhanalakshmi, M.D., D.G.O., M.N.A.M.S., Superintendent, M.N.A.M.S., Govt Kasturbha Gandhi Hospital for Women and Children, Triplicane, Chennai for providing with the necessary facilities to carry out this study and for her continuous support and guidance.

I am extremely grateful to Dr. Rathnakumar M.D., D.G.O., Registrar, Govt Kasturbha Gandhi Hospital for Women and Children, Triplicane, Chennai, for giving me inspirations, wise directions and encouragement at every stage in bringing out this dissertation.

I am extremely thankful to Dr. Rama, M.D., Pathology, Additional Professor of Pathology, Govt Kasturbha Gandhi Hospital for Women and Children, Triplicane, Chennai, for her wholehearted help in completing this venture.

I am extremely thankful to Dr. Dhanraj, Asst Professor in Radiology, Govt Kasturbha Gandhi Hospital for Women and Children, Triplicane, Chennai, for his wholehearted help in completing this dissertation.

I also thank Dr. Muthuvel, M.A., Ph.D., who helped me in completing statistical work.

I wish to thank all unit Chiefs, Assistants, Lab Technicians and all my colleagues for their continuous support.

I also thank all the patients for their kind co-operation.

# INDEX


| CONTENTS | PAGE. NO |
|---|---|
| 1.INTRODUCTION | 1 |
| 2.AIM OF THE STUDY | 4 |
| 3. REVIEW OF LITERATURE | 5 |
| 4.MATERIALS AND METHODS | 19 |
| 5.RESULTS AND STATISTICAL ANALYSIS | 23 |
| 6.DISCUSSION | 43 |
| 7.SUMMARY | 51 |
| 8.CONCLUSION | 53 |
| 9 BIBLIOGRAPHY | 54 |
| 10.PROFORMA | 59 |
| 11.MASTER CHART | |

# INTRODUCTION

Post menopausal bleeding is defined as bleeding that occurs after one year of amenorrhea in a women who is not receiving any hormone replacement therapy [1]

Post menopausal bleeding should always be investigated because it could be a sign of endometrial carcinoma or its precursors such as endometrial hyperplasia. Endometrial carcinoma has a much higher cure rate if diagnosed early. Stage 1 Endometrial cancer has a 5 year survival rate of 98 %; hence early diagnosis improves chances of cure .[3]

## ETIOLOGY OF POST MENOPAUSAL UTERINE BLEEDING [1]

| | |
|---|---|
| Atrophic endometritis- | 60 –80 % |
| Exogenous estrogens | 15 –25 % |
| Endometrial cancer - | 10 % |
| Endometrial hyperplasia | 10 % |
| Endometrial or cervical polyp | 2 – 12 % (Novak's Gynaecology) |

Office endometrial cytology is the accepted first step in evaluating patient with abnormal uterine bleeding or suggested endometrial pathology. Diagnostic accuracy of office based endometrial cytology is 90 –98 % when compared with subsequent findings at fractional curettage or hysterectomy. Although fractional curettage continues

to be the commonly performed procedure due to its diagnostic and therapeutic advantages, recent experience has shown that combination of transvaginal ultrasonography for endometrial thickness and endometrial cytology for histopathologic evaluation is more accurate for the diagnosis of endometrial pathology. Endometrial cytology is the most commonly used diagnostic procedure for post menopausal bleeding. It provides adequate sample for diagnosis of endometrial problems in 90- 100 % of cases but may fail to detect polyp and leiomyoma[7]. Any women with amenorrhea of one year duration or long who experiences uterine bleeding should have endometrial cytology.

Transvaginal ultrasonography gives information about suspected structural problems including fibroid uterus. It has 93% correlation with histological diagnosis Endometrial thickness measurement of less than 4-7 mm is rarely associated with carcinoma [25]

Endometrial cancer has a peak age of 55 years. 75% cases are post menopausal The role of unopposed estrogens as well as risk factors for obesity, diabetes, hypertension, low parity are well known'. Patients with post menopausal bleeding are considered to have cancer until proven otherwise. In the past such patients were routinely subjected to D&C first described in 1841. In 1950, however a review of 6907 curettage procedures found the technique missed endometrial lesions in 10%. of cases. Of these 80% were polyps.

In 1975 a study by Stock and Karbour on curettage found that in 16% of specimens, less than one quarter of cavity was curetted, in 60% less than one third of the cavity , in 84% less than three fourth of the cavity curetted. Ultimately D & C was largely replaced by vabra aspiration which uses a metal cannula attached to suction which was like a mini D &C This was found to be 86% accurate in diagnosing cancer. With trans vaginal ultrasonography, endometrial thickness of <5 mm, no cancer was missed if curettage was not performed. This treatment reduces no of D&C by 37%.

# AIM OF THE STUDY

To assess the comparative efficiency of Trans vaginal ultra sonogram, aspiration cytology of endometrium and fractional curettage of endometrium for evaluation of post menopausal uterine bleeding

# REVIEW OF LITERATURE

## ETIOLOGY OF POST MENOPAUSAL UTERINE BLEEDING

## ATROPHIC ENDOMETRITIS

Endometrial atrophy with dyssynchronous shedding of endometrium is the most common cause of post menopausal bleeding. Usually these women are post menopausal for 8-10 years. With endometrial biopsy, tissue yield is only poor or only blood and mucus obtained. There is no additional bleeding after biopsy[1]

## ESTROGEN REPLACEMENT THERAPY [4]

Unopposed estrogen therapy is a risk factor for endometrial hyperplasia and carcinoma. Risk is 4 times higher in post menopausal women receiving unopposed estrogen replacement therapy [1].

## ENDOMETRIAL POLYPS

- Accounts for 2-12% of post menopausal uterine bleeding. They are difficult to identify with endometrial biopsy or curettage.
- Endometrial polyps are susceptible to ulceration, inflammation, infarction which may cause bleeding.
- Endometrial polyp may undergo malignant change into carcinoma or sarcoma. [1]

## ENDOMETRIAL HYPERPLASIA

Occurs in 5-10% of patients with post menopausal bleeding. It develops in estrogen dominated hormonal status. Endometrial glands will be in the proliferative phase.

In post menopausal patients receiving exogenous estrogens, normal appearing proliferative endometrium must be considered hyperplasia, since volume and depth of endometrium will exceed that of postmenopausal atrophic endometrium.[1]

| **It may be**[3] | **progression to cancer** |
|---|---|
| Simple cystic without atypia | 1% |
| Complex adenomatous without atypia | 3% |
| Atypia- simple cystic | 8% |
| Complex adenomatous | 29% |

## ENDOMETRIAL CANCER

[1] Accounts for 10 % of cases of post menopausal bleeding.

| | **Relative risk** |
|---|---|
| Nulliparous | 2-3 |
| Late menopause | 2-4 |
| Obesity | 10 |
| Diabetes mellitus | 2.8 |
| Unopposed estrogen therapy | 4-8 |
| Tamoxifen | 2-3 |
| Atypical endometrial Hyperplasia | 8-29 |

## CANCER CERVIX

Post menopausal bleeding may be due to Cancer Cervix. They have a profuse and often malodorous discharge, especially when the disease is advanced. Any patient with abnormal vaginal bleeding or discharge should have a complete pelvic examination including speculum examination with visualization of cervix. Failure to examine the cervix in a patient with abnormal vaginal bleeding or discharge could result in failure to diagnose cervical cancer.

The first diagnostic consideration is to ensure that bleeding originates from the uterus. In elderly women, bleeding from urethra or rectum may be reported as vaginal bleeding.

## DIAGNOSTIC APPROACH TO POST MENOPAUSAL BLEEDING

There are various diagnostic approaches available for evaluation of post menopausal bleeding.

## PAP SMEAR

Presence of endometrial cells particularly atypical glandular cells in pap smear may be associated with uterine cancer .Only 30-50% with cancer have abnormal results hence it is unreliable.

## ASPIRATION CYTOLOGY OF ENDOMETRIUM

This method allows more thorough evaluation.

It is used to diagnose or exclude certain types of endometrial pathology as an out patient procedure.

It does not require anaesthesia.

Diagnostic accuracy of office based endometrial cytology is 90-98% when comapared with the subsequent findings at curettage or hysterectomy.

There are various suction devices available such as Vabra aspirator,Tis-U-Trap and Pipelle or equivalent.

Post menopausal cervical canal is stenotic and difficult to penetrate. Because of discomfort associated with the passage, newer silastic cannulae have been developed.

A small metal or plastic cannula with an outside diameter of 3 mm with a slightly curved tip of opening on convex surface for easier insertion through small endocervical canal is connected to a plastic tubal chamber containing a cylindrical plastic filter.At the opposite end of the chamber, the plastic chamber is connected to a negative pressure locus.

Pipelle is a clear flexible poly propylene sheath that is 2.3 cm long with a small tube in the distal end .Inside the sheath is a piston.When piston is with drawn,it creates a negative pressure in the endometrial cavity with tissue sucked into the sheath.

Another device not requiring a syringe to develop negative pressure is a disposable plastic tube with a 3.1 mm outer diameter, aspiration port and solid plastic obturator at its tip. Obturator fits so closely that its slow withdrawal from uterine cavity causes sufficient suction to obtain specimen.

Office endometrial aspiration cytology is the accepted first step in evaluating patients with abnormal uterine bleeding or suggested endometrial pathology. Diagnostic accuracy of office endometrial cytology is 90- 98 % when compared with subsequent findings at D &C or hysterectomy.

## INDICATIONS FOR ENDOMETRIAL ASPIRATION CYTOLOGY

- Abnormal uterine bleeding
- Post menopausal bleeding
- Cancer screening (hereditary non polyposis Colorectal cancer)
- Detection of pre cancerous hyperplasia and atypia
- Endometrial dating
- Follow up for previously diagnosed endometrial hyperplasia
- Evaluation of uterine response to hormonal treatment
- Evaluation of infertility
- Abnormal pap smear with atypical cells favouring endometrial origin

## CONTRAINDICATIONS FOR ENDOMETRIAL ASPIRATION CYTOLOGY

- Coagulopathy
- Acute cervical or vaginal infections
- Acute pelvic inflammatory disease
- Cervical cancer.

## ADVANTAGES

No cervical dilatation is necessary and it permits almost painless endometrial sampling. Formal D&C under anaesthesia has been avoided if the removed tissue contains adenocarcinoma

- It is cost effective
- Provides adequate tissue sample
- Easily carried out in office setting.
- Diagnostic accuracy is 90 –98 %

## EFFECTIVENESS

- Sensitivity of aspiration sampling in detecting uterine cancer is 67-100%
- Over all specificity is 100 %
- When there is a small focus of malignancy pipelle is more likely to miss it.

## LIMITATIONS

- Not able to detect any structural abnormalities such as polyp or fibroid.
- Aspiration cytology is least sensitive in early disease and disease confined to polyps.
- Uterine perforation is 1-2 per 1000 cases

## NORMAL FINDINGS

- Proliferative endometrium
- Secretory endometrium
- Changes due to hormonal intake

## ABNORMAL FINDINGS

### 1.ENDOMETRIAL HYPERPLASIA

Reflects an exaggerated proliferative response to endometrium. Benign lesions includes anovulatory, proliferative, cystic glandular hyperplasia ,simple cystic hyperplasia, simple hyperplasia, adenomatous hyperplasia without atypia [1]

**2**.Endometrial changes with presence of atypia with abnormal proliferation including features of back to back crowding of glands, with epithelial activity demonstrated by papillary projections into the glands is associated with an increased risk of progression to endometrial cancer. These architectural abnormalities may be associated with individual cellular atypia (enlarged irregular nuclei ,chromatin clumping and prominent nucleoli) Presence of mitotic activity can be variable[2]

### 3. Well differentiated adeno carcinoma of endometrium

Glands and complex papillae are in direct contact with no intervening endometrial stroma,[1] the so called to back to back pattern

### FRACTIONAL CURETTAGE

Recamier introduced curettage in 1943. It is used for diagnostic as well as therapeutic purposes.Patient placed on the table in the lithotomy position. Careful pelvic examination locates the position of uterine corpus and the vagina and the perineum are cleaned with betadine.cervix is grasped with vulsellum. Endo cervical curettage is performed. Uterine sound is passed carefully through cervical canal into uterine cavity to avoid creating a false passage**.** Passing the uterine sound provides confirmatory information about the position of uterus, the length of the uterine cavity ,angulation between the cervical canal and the uterine cavity.

Cervical canal is dilated with a dilator. Then fractional curettage is done on the anterior, lateral and posterior walls and finally the top of the cavity is scraped with side to side movement. The handle of curet should never be held against the palm of hand It would be held as one would hold a pencil.

It should be reserved for patients with abnormal endometrial biopsies or for conditions that preclude performing aspiration cytology such as cervical stenosis.

## DISADVANTAGES

- Anaesthesia is needed.
- To be kept nil oral for 6 hours.
- May lead to infection, perforation, synechiae formation.
- Uterine perforation in 0.6-1.3% of cases.
- Haemorrhage in 0.4% of cases.
- Associated with significant sampling error,

- Less than half of endometrium sampled in 60% of patients.
- In 10-25% the procedure alone does not uncover endometrial pathology[9,10],

## IMAGING TECHNIQUES

### HYSTEROSALPINGOGRAPHY

This can pick up polyp, fibroid, adhesions or septa.

Patient in lithotomy position, with out general anaesthesia with cannula in place, a non – irritant radio opaque contrast is injected through cervix into the cavity. Radio opaque material is injected slowly from a syringe. Flow through the uterus observed by film exposed at intervals.

### TRANS ABDOMINAL SONOGRAPHY

Ultra sound waves in frequency range of 3.5-5 M Hz passes through abdominal wall which has been smeared with jelly to secure acoustic coupling. Solid tissues reflect the ultra sound beam while liquid allowed to pass through. Reflected echoes are converted to electrical signals and images according to character of tissues encountered by entering beam.

### TRANS VAGINAL ULTRASONOGRAPHY

Trans vaginal probe produces waves in frequency range of 5-9 MHz.

With the introduction of trans vaginal ultrasonography in 1980 s with endometrial echoes less than 5 mm, no cancer was missed if curettage was not performed. This treatment reduces the no of D&C by 37%.

In women with postmenopausal bleeding, transvaginal USG forms a simple inexpensive well tolerated office procedure to triage patients.

If there is no anatomical endometrial pathology it can be treated expectantly or hormonally.

If globally thickened endometrial tissue, they are candidates for blind sampling.

If abnormally thickened focal tissue including polyps and non global pathology, there is a need for visually directed sampling (hysteroscopy directed biopsy).

Trans vaginal USG is used as a screening tool in patients with post menopausal bleeding. Average thickness of post menopausal endometrium is 2.3 + or - 1.88 mm with average of 0 –10 mm

If endometrial echo is less than 5mm, pathology show either inactive or no endometrial tissue. With endometrial echo of more than 4 mm, it had sensitivity of 96%, specificity of 68% for detecting endometrial pathology.

## ADVANTAGE OF TRANSVAGINAL ULTRASONOGRAPHY

Since the probe is in the vagina, the distance between transducer and the structure to be examined is very less.

It allows high-resolution image of pelvic structures and to assess endometrial thickness, follicle size and evaluation of adnexal lesion.

It is used in evaluation of endometrial lesion and assessing myometrial invasion by endometrial carcinoma.

Vaginal probe gives better visualization of endometrium than trans abdominal imaging.This procedure does not require a full bladder.

## DISADVANTAGES

- Initial lack of observer orientation to anatomy and depth of view is limited to about 70 mm.
- Accuracy is highly operator dependent

## INDICATIONS FOR TRANS VAGINAL ULTRASONOGRAPHY

- Abnormal uterine bleeding
- Peri menopausal and post menopausal bleeding evaluation
- Infertility
- Follow up of harmone replacement therapy
- Follow up of adjuvant harmone therapy

## NORMAL FINDINGS

- Endometrial thickness in proliferative phase is 2.9 + or – 1 mm thickness and in secretory phase is 3.6 + or – 1mm.
- Atrophic endometrium appears as a single lining.
- Proliferative endometrium normally appears as hypo or iso echoic areas.
- Mid cycle or peri ovulatory endometrium shows a tri laminar pattern .
- Luteal phase endometrium is usually hyperechoic due to increased intensity from endometrial glands and increased glycogen accumulation.

## ABNORMAL FINDINGS

## ENDOMETRIAL HYPERPLASIA

Appears as thick hyper echogenic endometrium which is symmetrical.

## POLYPS

Polyps appears as protrusion into the cavity. Size of the polyp, site and whether they have any cystic areas can be noted. Colour Doppler demonstrates atypical blood pattern which may suggest malignancy.

## FIBROID

Site of the fibroid and whether there is any degeneration can be noted .

## ABNORMALITIES OF UTERINE CAVITY

- Malformations of uterine cavity can be identified.
- Bicornuate uterus shows presence of endometrial cavities separated by echogenic appearance of myometrium.

## HYSTEROSCOPY

- First described by Pantaleoni in 1869.
- Hysteroscopy may be diagnostic or operative. It is done under local anesthesia using hysteroscope with diameter less than 4 mm, so that cervical dilatation is not required.
- Using glycine, dextran , RL as distending medium which washes away the debris and aids in good visualization. It requires a pressure of 70 mm Hg .

- Abnormalities detected include polyps, endometrial hyperplasia , sub mucus myoma , septate uterus, uterine synechiaea, haemangioma ,AV malformations .
- D&C hysteroscopy reserved for situations in which cervical stenosis or patient tolerance does not permit adequate evaluation by aspiration biopsy or bleeding recurs or after a negative endometrial biopsy or specimen obtained is inadequate to explain abnormal uterine bleeding .
- Office hysteroscopy is complementory to D&C .To identify missed pathology such as polyp and sub mucus myoma and to allow directed biopsy of suspicious areas

## ADVANTAGES

- Therapeutic application.
- Accurate diagnosis.
- Abnormal site visualised and sample is taken from abnormal site.

## DISADVANTAGES

- Expensive.
- Invasive procedure requiring theatre set up.
- Needs experience to perform this procedure.
- Complication such as perforation, bleeding , fluid overload, electrolyte imbalance, gas embolism can occur. Infection, secondary haemorrhage, haematometra, cyclic pain are delayed complications .

## SALINE INFUSION SONO HYSTEROGRAPHY

Richmal et al first used this technique in 1984 to evaluate tubal patency in infertile women. It is a diagnostic procedure that enhances endometrial image by using saline as a contrast medium. It is used in conjuction with trans vaginal ultrasonogram for diagnosis of endometrial abnormal uterine bleeding, infertility, recurrent abortion, ashermanns syndrome. Tubes can also be investigated.

Using saline as a contrast medium, it produces a contrast that helps localization of uterine abnormalities. 10- 15 ml of sterile saline is introduced into endometrial cavity under ultrasound guidance.

## ADVANTAGES

- No anaesthesia.
- Safe.
- Cost effective.
- Excellent visualization of endometrial cavity.
- Detect focal hyperplasia.
- No perforation or haemorrhage.

## LIMITATIONS

- PID .
- Cervical stenosis .
- Needs expertise .

# MATERIALS AND METHODS

Study conducted in Govt. Kasturbha Gandhi Hospital between October 2003 and November 2005 on 150 patients.

150 women with post menopausal bleeding were selected based on the following inclusion and exclusion criteria, were subjected to transvaginal USG, aspiration cytology of endometrium and fractional curettage for diagnosing underlying pathology of post menopausal bleeding.

Comparative efficacy of TVS USG, aspiration cytology of endometrium with fractional curettage were correlated with the histo pathologic results from hysterectomy and the same was identified as gold standard.

## INCLUSION CRITERIA

(1) Any women who develops vaginal bleeding following cessation of periods for a minimum of 1 year (post menopausal bleeding).
(2) Not on any harmone therapy .
(3) No demonstrable pelvic pathology.
(4) No evidence of blood dyscrasias.
(5) Age of women 40 and above (to exclude premature menopause).

## EXCLUSION CRITERIA.

1. Women on contraceptives.
2. Women with blood dyscrasias.
3. Women with demonstrable pelvic pathology like polyp, myoma etc.
4. Cancer cervix

## PROCEDURE:

The procedure of Transvaginal ultrasonogram with aspiration cytology of endometrium was carried out in post menopausal women, selected on basis of inclusion and exclusion criteria described above.

Patients underwent transvaginal USG.

# TRANSVAGINAL ULTRASONOGRAM

## MATERIALS USED

- Ultrasonogram
- Trans vaginal probe.

## METHODS

Using Transvaginal probe, endometrial thickness was measured as a sagittal image (long axis) of uterus. Measurement was performed on the thickest portion of

endometrium and including hypoechoic inner myometrium, measured from echogenic interface of junction of endometrium and myometrium.

It is a double thickness measurement anteroposteriorly from basalis to basalis at fundus.

If fluid is present, it is usually associated with cervical stenosis and atrophy. The layers are measured separately and should be symmetrical and can be added together excluding the fluid.

Endometrial cavity is three dimensional structure and the entire cavity was imaged..

Patients with normal findings, endometrial hyperplasia and polyps were posted for aspiration cytology of endometrium.

# ASPIRATION CYTOLOGY OF ENDOMETRIUM

**Materials Used:** [32,31]

**MANUAL VACUUM ASPIRATOR**

It contains small cannula of different sizes which is attached to a piston which contains double lock.

## METHODS USED FOR SAMPLING OF ENDOMETRIUM

Patient is advised to take a non - steroid inflammatory drug 1 hour before the procedure to decrease uterine cramping.

Cervix is swabbed with iodine. Cannula of smaller size is inserted through cervical os. If difficulty is encountered, a tenaculum can be applied to anterior lip of cervix to apply gentle counter traction.

Para cervical block is given. In cases in which there is difficulty in inserting, 200mg misoprostol can be inserted into vagina to dilate the cervix and patient returns to hospital the following day.

Once the cannula is in the uterine cavity, usually at a depth of 7-9mm, suction is created by withdrawing the piston, after locking. While moving vacuum aspirator in and out, cannula is slowly rotated $360^{o}$, so that sample is taken from wide area of uterine cavity. To increase area of sampling, cannula can be advanced again into cavity before it is withdrawn entirely.

Tissue is placed in a container of formalin and sent to histology.

Hysterectomy was done in patients with

- Suspicious pathology
- Abnormal findings
- Malignancy
- Patients themselves opted for surgery
- Not reliable for follow up

# RESULTS AND STATISTICAL ANALYSIS

150 patients were included in the study and the outcome analyzed using various parameters. The study was carried out at Government Kasturbha Gandhi Hospital during the period of October 2003 to November 2005 The results were subjected to statistical analysis using the chi-square test and frequency and percentage analysis.

Sample size – 150 patients.

Transvaginal sonogram done in 150 patients.

Aspiration cytology of endometrium done in 150 patients.

Hysterectomy done in 95 patients.

Out of 150 patients, subjected to TVS & aspiration cytology of endometrium, 95 underwent hysterectomy because of

Suspicious Pathology
Abnormal Findings.
Malignancy.
Patients themselves opted for surgery.
Not reliable for follow up.

The findings of Transvaginal ultrasonogram, and aspiration cytology of endometrium were correlated with the hysterectomy specimens in these women.

Those patients with no demonstrable pathology or symptoms were followed up. 28 patients were lost to follow up after aspiration cytology of endometrium & 77 patients did not have any further episode of bleeding. They are still being followed up.

# CHARACTERISTICS OF THE STUDY GROUP

**TABLE – 1**

## AGE DISTRIBUTION OF THE STUDY GROUP

N= 150

| Age | No | % |
|---|---|---|
| 40-49 | 20 | 13.5 |
| 50-55 | 88 | 48.6 |
| 56-60 | 32 | 20.7 |
| >60 | 20 | 14 |

Majority of patients belonged to age group of 50-60 years (69.3%). Youngest patient in this group is 40 & oldest patient is 73 years old.

**TABLE – 2**

## DISTRIBUTION OF STUDY GROUP ACCORDING TO PARITY

| | No | % |
|---|---|---|
| I | 17 | 11.3% |
| II | 54 | 36% |
| III | 47 | 31.3% |
| IV & Above | 32 | 21.4% |

None of the women in this study were nulliipara.

**TABLE –3**

## DURATION OF COMPLAINTS

| DURATION | NO | % |
|---|---|---|
| < 3 Months | 100 | 66.7% |
| 3-6 Months | 33 | 22% |
| 6 Months- 1 year | 16 | 10.7% |
| >1 Year | 1 | 0.7% |

- Majority of patients presented with complaints of bleeding with in 6 months of onset – 88.7%
- 14 Patients presented beyond 1 year of onset of symptoms

## TABLE – 4

## SOCIO ECONOMIC DISTRIBUTION

| SOCIO ECONOMIC CLASS | NO | % |
|---|---|---|
| II | 1 | 0.7 |
| III | 16 | 10.7 |
| IV | 64 | 42.7 |
| V | 69 | 46 |

- Majority of patients in the study group beyond to low socio economic status group.

## TABLE – 5

## ASSOCIATED MEDICAL ILLNESS

Obesity & Hypertension are the most common co-morbid conditions noted among study group.

There were 14 patients with diabetes mellitus and 12 with anemia at presentation.

| | No | % |
|---|---|---|

| | | |
|---|---|---|
| Anemia | 12 | 8 |
| HT | 22 | 14.7 |
| DM | 7 | 4.7 |
| Obesity | 16 | 10.6 |
| HT/DM | 4 | 2.7 |
| DM/Obesity | 2 | 0.7 |
| HT/1HD/Obesity | 1 | 0.7 |

The total number of co morbid conditions are more since one individual may have more than one disease.

# RESULTS OBTAINED BY THE DIAGNOSTIC METHODS

## TABLE- 6

### FINGINGS IN TRANS VAGINAL SONOGRAM

N=150

| | **Number** | **%** |
|---|---|---|
| Normal | 114 | 76 |
| Hyperplasia | 30 | 20 |
| Polyp | 4 | 2.7 |
| Fibroid | 3 | 1.3 |

- All the patients is study group underwent l Transvaginal sonogram.
- Abnormal findings like polyp, hyperplasia, submucus fibroid were noted in 37 patients (24.7%) while remaining 113 patients (75.3%) had normal findings consistent to their age.

# FINDINGS IN ASPIRATION CYTOLOGY OF ENDOMETRIUM

## TABLE – 7

| | **Number** | **%** |
|---|---|---|
| Atrophic | 93 | 62 |
| Proliferative/<br><br>Secretory | 37 | 24 |
| Hyperplasia | 17 | 11.3 |
| Cancer | 3 | 2 |

All the patients in the study group underwent the procedure of aspiration cytology of endometrium.

- 93 patients (62%) had normal findings.
- 57 patients (38%) had abnormal findings.

**TABLE – 8**

## FINDINGS IN FRACTIONAL CURETTAGE OF ENDOMETRIUM

| | **Number** | **%** |
|---|---|---|
| Atrophic | 93 | 62 |
| Proliferative/ Secretory | 37 | 24.7 |
| Hyperplastic | 17 | 11.3 |
| Cancer | 3 | 2 |

All the patients in the study group underwent fractional curettage of endometrium.

- 93 Patients had normal (62%) findings
- 57 patients (38%) had abnormal findings.

## COMPARATIVE STUDY OF FRACTIONAL CURETTAGE WITH HYSTERECTOMY

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 162.622(a) | 15 | .000 |
| Likelihood Ratio | 123.091 | 15 | .000 |
| Linear-by-Linear Association | 41.218 | 1 | .000 |
| N of Valid Cases | 95 | | |
| A 19 cells (79.2%) have expected count less than 5. The minimum expected count is .06. | | | |

**TABLE – 9**

# FINDINGS IN HYSTERECTOMY SPECIMENS

N= 95

| | Number | % |
|---|---|---|
| Atrophic | 45 | 47.2% |
| Proliferative<br><br>Secretory | 8 | 9.6% |
| Hyperplastic | 17 | 17.7% |
| Polyp | 18 | 20% |
| Cancer | 5 | 5.2% |
| Submucus<br><br>Fibroid | 2 | 2.1% |

- The pathological findings obtained after hysterectomy were taken as the gold standard against which other findings were correlated.
- 95 patients underwent hysterectomy among the study group of 150
- Hyperplasia was detected in 17 patients (17.7%)and .
- 5 were detected to have adeno carcinoma 3 were of well differentiated adenocarcinoma. 2 showed papillary adeno carcinoma.
- 18 polyps (20%)were diagnosed.
- In most of them i.e., 86.7% of the pathological specimen turned out to be normal.

- The patients were selected for hysterectomy on the basis of abnormal findings in TVS, Aspiration cytology of Endonetrium, D & C, patients unreliable for follow up and when they themselves opted for hysterectomy.
- 47.2%are due to atrophic endometritis
- 20% are due to endometrial polyps.
- 5% are due to cancer.
- 17% are due to endometrial hyperplasia.

# COMPARISION OF TVS WITH HYSTERECTOMY

**TABLE – 10**

| HYST | TVS Normal | Atrophy | Hyperplasia | Polyp | Fibroid |
|---|---|---|---|---|---|
| Atrophy | 45 | 0 | 1 | 0 | 0 |
| Proliferative | 7 | 0 | 1 | 0 | 0 |
| Hyperplasia | 0 | 0 | 16 | 0 | 0 |
| Polyp | 8 | 0 | 5 | 4 | 1 |
| Cancer | 0 | 0 | 5 | 0 | 0 |
| Fibroid | 1 | 0 | 0 | 1 | 2 |

Majority of findings showed normal in Transvaginal sonogram (52 cases) showed atrophic endometrium in 44 cases and proliferative/ Secretory endometrium in 7 cases.

- 1 case of atrophic endometrium was wrongly diagnosed as hyperplasia in TVS. 7 cases of normal proliferative phase of endometrium were wrongly diagnosed as hyperplasia in TVS.
- 16 Cases of Hyperplasia were correctly diagnosed
- 4 cases of polyps were correctly diagnosed.
- 5 cases of polyp were diagnosed as hyperplastic endometrium in TVS.
- 8 cases of polyp were wrongly diagnosed as normal in TVS.
- 5 Cases of hyperplastic endometrium in TVS found to be cancer, which has more than 5 mm thickness.
- 1 case of fibroid was correctly diagnosed.

# COMPARATIVE STUDY OF TVS WITH HYSTERECTOMY

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 115.594(a) | 20 | .000 |
| Likelihood Ratio | 103.853 | 20 | .000 |
| Linear-by-Linear Association | 42.535 | 1 | .000 |
| N of Valid Cases | 95 | | |
| a 23 cells (76.7%) have expected count less than 5. The minimum expected count is .02. | | | |

# COMPARISION OF TVS WITH ASPIRATION CYTOLOGY OF ENDOMETRIUM

**TABLE – 11**

| EM CYTOLOGY | NORMAL | HYPERPLASIA | POLYP | FIBROID |
|---|---|---|---|---|
| Atrophic | 87 | 5 | -- | -- |
| Prolif / sec | 24 | 9 | 1 | 2 |

| | | | | |
|---|---|---|---|---|
| Hyperplasia | -- | 16 | 4 | -- |
| Polyp | -- | -- | -- | -- |
| Cancer | -- | 3 | -- | -- |
| Fibroid | -- | -- | -- | -- |

- 87 cases correctly diagnosed as normal which showed atrophic endometrium in cytology.
- 24 cases of prolif/sec phase were diagnosed as normal in TVS.
- 5 cases of atrophic endometrium in cytology were wrongly diagnosed as hyperplasia.
- -16 cases of hyperplasia were correctly diagnosed. 9 cases of hyperplasia had normal findings in cytology.

## COMPARISION OF ASPIRATION CYTOLOGY OF ENDOMETRIUM WITH HYSTERECTOMY

| | | Endometrial Cytology | | | | Total |
|---|---|---|---|---|---|---|
| | | Atrophy | proliferative/Secretory | Hyperplasia | cancer | |
| Hysterectomy | Atrophy | 43 | 2 | 0 | 0 | 45 |
| | Proliferative/Secretory | 1 | 7 | 0 | 0 | 8 |
| | Hyperplasia | 4 | 0 | 13 | 0 | 17 |
| | Polyp | 4 | 11 | 3 | 0 | 18 |
| | cancer | 0 | 1 | 1 | 3 | 5 |
| | Fibroid | 0 | 2 | 0 | 0 | 2 |
| Total | | 52 | 23 | 17 | 3 | 95 |

- 43 Cases were correctly diagnosed as atrophic endometrium.
- 7 cases of normal proliferative phase of endometrium were correctly diagnosed.
- 1 Case of prolif endometrum was wrongly diagnosed as atrophic.
- 13 Cases of hyperplasia were correctly diagnosed.
- 4 Cases of hyperplastic endometrium were wrongly diagnosed as atrophic endometrium.
- 11 cases of polyp were reported as proliferative in aspiration cytology.
- 3 Cases of polyps were reported as hyperplastic endometrium in cytology.
- 4 cases of polyps were reported as atrophic endometrium in cytology.
- 3 cases of cancers were correctly diagnosed. . 1 case of cancer was wrongly diagnosed as proliferative endometrium.
- 2 Cases of submucus fibroid showed proliferative endometrium in cytology .

## COMPARATIVE STUDY OF ASPIRATION CYTOLOGY OF ENDOMETRIUM WITH HYSTERECTOMY

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 162.622(a) | 15 | .000 |
| Likelihood Ratio | 123.091 | 15 | .000 |
| Linear-by-Linear Association | 41.218 | 1 | .000 |
| N of Valid Cases | 95 | | |

A 19 cells (79.2%) have expected count less than 5. The minimum expected count is .06.

## COMPARATIVE STUDY OF TVS, ASPIRATION CYTOLOGY OF ENDOMETRIUM AND HYSTERECTOMY

Hysterectomy * TVS * Endometrial Cytology Cross tabulation

Count

| Endometrial Cytology | | | Hysterectomy | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | Atrophy | proliferative/ Secretory | Hyperplasia | Polyp | cancer | Fibroid | |
| Atrophy | TVS | Normal | 43 | 1 | 0 | 4 | | | 48 |
| | | Hyperplasia | 0 | 0 | 4 | 0 | | | 4 |
| | Total | | 43 | 1 | 4 | 4 | | | 52 |
| Proliferative/ Secretory | TVS | Normal | 1 | 6 | | 4 | 0 | 1 | 12 |
| | | Hyperplasia | 1 | 1 | | 5 | 1 | 0 | 8 |
| | | Polyp | 0 | 0 | | 1 | 0 | 0 | 1 |
| | | Fibroid | 0 | 0 | | 1 | 0 | 1 | 2 |
| | Total | | 2 | 7 | | 11 | 1 | 2 | 23 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Hyperplasia | TVS | Atrophy | | | 1 | 0 | 0 | | 1 |
| | | Hyperplasia | | | 12 | 0 | 1 | | 13 |
| | | Polyp | | | 0 | 3 | 0 | | 3 |
| | Total | | | | 13 | 3 | 1 | | 17 |
| Cancer | TVS | Hyperplasia | | | | | 3 | | 3 |
| | Total | | | | | | 3 | | 3 |

## COMPARATIVE STUDY OF TVS, ASPIRATION CYTOLOGY OF ENDOMETRIUM AND HYSTERECTOMY

| Chi-Square Tests | | | | |
|---|---|---|---|---|
| Endometrial Cytology | | Value | df | Asymp. Sig. (2-sided) |
| Atrophy | Pearson Chi-Square | 52.000(a) | 3 | .000 |
| | Likelihood Ratio | 28.204 | 3 | .000 |
| | Linear-by-Linear Association | 12.647 | 1 | .000 |
| | N of Valid Cases | 52 | | |
| proliferative/Secretory | Pearson Chi-Square | 11.705(b) | 12 | .470 |
| | Likelihood Ratio | 11.696 | 12 | .470 |
| | Linear-by-Linear Association | 3.661 | 1 | .056 |
| | N of Valid Cases | 23 | | |

| | | | | |
|---|---|---|---|---|
| Hyperplasia | Pearson Chi-Square | 17.101(c) | 4 | .002 |
| | Likelihood Ratio | 15.998 | 4 | .003 |
| | Linear-by-Linear Association | 3.052 | 1 | .081 |
| | N of Valid Cases | 17 | | |
| Cancer | Pearson Chi-Square | .(d) | | |
| | N of Valid Cases | 3 | | |
| a.7 cells (87.5%) have expected count less than 5. The minimum expected count is .08. | | | | |
| b.19 cells (95.0%) have expected count less than 5. The minimum expected count is .04. | | | | |
| c.8 cells (88.9%) have expected count less than 5. The minimum expected count is .06. | | | | |

## COMPARATIVE STUDY OF TRANSVAGINAL ULTRASONOGRAM WITH HYSTERECTOMY

| | **True Positive** | **False Positive** | **Total** |
|---|---|---|---|
| Positive | 39 | 5 | 44 |
| | False Negative | True Negative | |
| Negative | 12 | 60 | 72 |
| Total | 51 | 65 | |

Sensitivity - 76%

Specificity - 92%

Positive Predictive Value - 88.6%

Negative Predictive Value - 83.3%

# COMPARITIVE STUDY OF ASPIRATION CYTOLOGY OF ENDOMETRIUM WITH HYSTERCTOMY

| | TRUE POSITIVE | FALSE POSITIVE | TOTAL |
|---|---|---|---|
| Positive | 22 | 11 | 33 |

| Negative | False Positive | True Negative | Total |
|---|---|---|---|
| | 4 | 67 | 71 |
| Total | 26 | 78 | |

Sensitivity 84.6%

Specificity 97.1%

Positive Predictive value 91.6%

Negative Predictive value 94.3%

**Crosstabs**

| Case Processing Summary | | | | | | |
|---|---|---|---|---|---|---|
| | Cases | | | | | |
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| Hysterectomy * TVS | 95 | 63.3% | 55 | 36.7% | 150 | 100.0% |
| Hysterectomy * Endometrial Cytology | 95 | 63.3% | 55 | 36.7% | 150 | 100.0% |
| Hysterectomy * D&C | 95 | 63.3% | 55 | 36.7% | 150 | 100.0% |

When transvaginal ultrasonogram, aspiration cytology are compared to hysterectomy as the gold standard, there are signficant correlation between TVS USG & aspiration cytology of endometrium & hysterectomy with a p value of 0.000. Similarly, using frequency analysis of these two methods vis a vis, hysterectomy, both of them appear to obtain a correct diagnosis in all the cases for whom hysterectomy was done. In 63.3% it gave a correct diagnosis. In 36.7% hysterectomy was not done.

# DISCUSSION

This prospective, descriptive, comparative, study analyzing the role of Transvaginal ultrasonography and aspiration cytology of endometrium and fractional curettage in post menopausal bleeding was undertaken in 150 patients.

The results of this study is discussed as follows.

## CHARACTERISTICS OF THE STUDY GROUP (Table 1,2,3,4,5)

- Most of the patients belonged to the age group of 50-60 years (69.3%).
- Patients were selected irrespective of their party.
- 88.7% of patients presented with in 6 months of the onset of symptoms.
- 88.7% of the patients belongs to class IV and class V socioeconomic status with none of them belonging to class I.
- Obesity and hypertension were the most common co-morbid conditions noted among the patients, with diabetes mellitus and anaemia also being seen among the patients.

## TRANSVAGINAL SONOGRAM

All the patients in the study group underwent an initial transvaginal sonogram Abnormal findings like Polyp, hyperplasia and submucus fibroid were noted in 37 patients (24.7%) while the remaining 113 patients (75,3%) had normal findings consistent to their age.

This correlated with the study by [14] Varner et al, in 80 women with 5mm endometrial thicknessm thickness, 2 had inactive, 1 proliferative, 1 hyperplasia, 1

cancer. In [44] Gull et al Study of 198 women, with 5mm endometrium thickness 36 primary endometrial cancer, 1 metastatic cancer and 3 cases of hyperplasia were detected.In Kufabl [26] study 16 had endometrial cancer, 7 atypical hyperplasia,. 4 complex hyperplasia .16 cases were correctly diagnosed as hyperplasis, but could not differentiate between polyp & hyperplasis in 5 of the cases ,5 cases of adenocarcinoma were diagnosed with more than 4mm endometrial thickness. There was also an over diagnosis of hyperplasia in 1 case.

This correlated with Gull et al study [44] and in [38] Nordic multi center study 11.5%were diagnosed as endometrial cancer based on histopathology. 4 had endometrial thickness of 5-7mm, 35 had endometrial thicknessof 7-8 mm. No cancers were detected in endometrial thickness of <4mm which correlated with our study.

4 cases of Polyp were correctly diagnosed. But it could not differentiate between hyperplasia and polyp in 5 of the cases. 8 cases wrongly diagnosed as normal turned out to be polyp.

Over all TVS, was able to obtain statistically significant results (P=.000) in the detection of uterine pathology with a correct diagnosis in 61% of cases.

In our study, sensitivity for transvaginal ultrasonogram in detecting endometrial pathology is 76% & specificity is 92%.Positive predictive value is 88.6% and negative predictive value is 83.3%.

Other studies shows:

Karlsson etal [38]

Sensitivity 96%

Specificity 68%

GullB.[44]

100% sensitivity

60% specificity

Smith Blindman [12]

Sensitivity is 96%

In asymptomatic postmenopausal with 5 mm cut off Fleisher study shows 33% sensitivity[25]

Transvaginal sonogram was able to demonstrate uterine abnormalities but an accurate pathological diagnosis was not possible in most cases.

With endometrium thickness ,less than 5 mm endometrial thickness pathology show either inactive or no endometrial tissue (Nasri et al1991)[21]

5 cases of cancer detected in our study showed hyperplasia with endometrial thickness more than 4 mm. 3 of them had 5-8 mm thickness and 2 of them had 7-8 mm thickness.

This correlated with Nordic trial [38] which has 11.5% cancer detection rate, 4 had endometrial thickness of 5-7mm, 35 had endometrial thickness of >8mm

No cancer was missed in our study. In karlsson study only 2 cancers have been missed with 5mm out off.

No curettage is needed with less than 5 mm endometrial thickness .It would reduce the need for D&C by 70% and not miss any cancer by 70% (Granberg 1991) [22]

No uterine cancer were found with 4 mm or less of endometrial thickness. With this set point 46% of endometrial biopsy would not have been necessary (Nordic trial) [38],[37] Prevalence of uterine cancer was 13% and prevalence of endometrial polyp and hyperplasia is 40%. With a normal endometrial thickness of 4 mm or less, probability of cancer following a normal transvaginal sonogram is 1 % (Smith blindman) [12]

## ASPIRATION CYTOLOGY OF ENDOMETRIUM

- All the patients in the study group underwent the procedure of aspiration cytology of endometrium

  93 patients (62%) had normal findings

  57 patients (38%) had abnormal findings

- Hyperplasia were detected in 17 patients. 5 cases of adenocarcinoma were detected. 3 of them were well differentiated adenocarcinoma and 2 of them showed papillary adenocarcinoma

  18 of them found to have polyp

- They correlated with Guido etal [7] study in which malignancy was detected in 8.3% Pipelle biopsy provided tissue adequate for analysis in 97%.

- In most of them 86.7%, the pathological specimens turned out to be normal.

- These findings were correlated with transvaginal sonogram findings with less than 4 mm endometrial thickness only in 13 cases there were no correlation.

- It correctly diagnosed 43 cases of atrophic endometrium and 7 cases with proliferative \ secretory phase of endometrium .2 cases were wrongly diagnosed as proliferative phase of endometrium which was found to be atrophic. 1 case of atrophic endometrium was found to be proliferative endometrium

- It correctly diagnosed 13 cases of hyperplasia. It wrongly diagnosed 4 hyperplastic cases as atrophic endometrium

- 3 cases of polyp showed hyperplastic changes. 11 showed proliferative \ secretory phase and 4 of the polyp cases showed atrophic changes in the endometrium. This is because 5% had tumor area localized to less than 5% of surface area .5-25 % of cavity in 18% and less than 50% of cavity in 46% of which pipelle missed 4 of them (Guido et al ) [7]

- 3 cases of cancer were correctly diagnosed .1 case is wrongly diagnosed as hyperplasia but it showed focal areas of atypical changes 1 case is wrongly diagnosed as proliferative phase . Endometrial cancer detection rate was 1.76% with office biopsy of endometrium (Hoffmeister in 1984 ) [29] Malignancy was detected in 8.3 % in Guido et al study [7]

- 2 cases of fibroid showed proliferative phase in aspiration cytology of endometrium

- 2 cases showed complex hyperplasia and 1 showed atypical hyperplasia others are of simple hyperplasia.This correlates with Kufabl study [26] which showed 2 endometrial cancer, 3 atypical hyperplasia and 6 complex hyperplasia with gynoscan.In Goldsmicht study aspiration biopsy performed in 135 patients ,13

had different histology .18 patients had hyperplasia of which pipelle missed four.5 had polyps in which 3 were missed

- Fractional curettage findings showed the same results Hence , aspiration cytology being an office procedure is better than traditional curettage. .

- In our study aspiration cytology of endometrium showed a sensitivity of 84.6%, specificity of 97%, Positive predictive value of 91.6%, negative predictive value of 94.3% which is the same for fractional curettage which correlated with other studies

| **7,8,34,35** | **sensitivity** |
|---|---|
| Ferry et al | 67% |
| Guido et al | 83% |
| Stovall et al | 97.5% |
| Vanden Bosch et al | 100 % |

On sampling with gynoscan [26] Kufabl J Pederson

| | |
|---|---|
| Sensitivity | 62.5% |
| Specificity | 94% |
| Positive predictive value | 94% |
| Negative predictive value | 92 % |

With routine curettage

| | |
|---|---|
| Sensitivity | 70.6% |
| Specificity | 100% |
| Positive predictive value | 100% |
| Negative predictive value | 98% |

1 endometrial cancer and 2 complex hyperplasia were missed

Over all, aspiration cytology of endometrium was able to obtain statistically significant results p=0.000 in detection of uterine pathology.

Aspiration cytology of endometrium had 98 % accuracy in evaluating abnormal uterine bleeding It is more accurate in detecting global process of endometrium It is not accurate in determining focal lesion such as polyp for which other methods such as trans vaginal sonography or saline infusion sonography is needed.

[30] Suction curettage is 98% accurate in evaluating high risk women with abnormal uterine bleeding (Lutz et al in 1977)

Lower sensitivities may be due to conditions in which malignancy was confined to a polyp or when there is a small focus of malignancy and it may sample a small percentage of endometrial area (Guido et al ) [7] In some,the patients previously had D&C ,so that much of the tissue has been removed already [(7,8,34,35)]

Several methods have been evaluated such as Pipelle,Tao Brush, Uterine explora curette with regard to their ability to identify abnormal pathology (ATAC Trial Duffy S Jackson TL,Landson M et al 2003 )

Manual vacuum aspirators efficacy is much better in diagnosing abnormal pathology of endometrium Pipelles biopsy missed focal pathology in endometrium It is excellent for detecting global process of endometrium.(Guido et al ). [7] In 97% biopsy provides tissue adequate for analysis 8% had disease confined to endometrial polyp.

Diagnostic accuracy of endometrial pathology by aspiration cytology of endometrium is 98% which is better than the diagnosis of endometrial pathology by regular curettage

There were identical histological patterns when comparing the results of suction curettage with that of regular curettage

Accuracy of diagnosis of endometrial pathology by suction curettage is 84.6% which correlates with the study of Cohen et al in 1974 which showed accuracy of 76-92%([29],[31])

Sensitivity is 97.5 % in diagnosis of endometrial pathology by pipelles device which is better than that of Novaks curette ( Stovall et al 1995). [34]

Aspiration cytology of endometrium has the same sensitivity as traditional fractional curettage. So, it can be better used as a office procedure in diagnosing endometrial pathology .Combination of transvaginal sonogram and endometrial cytology in diagnosing endometrial cancer with a sensitivity of 100% and accuracy of endometrial cytology is better than routine curettage. Hysterectomy agreed with the histological methods .

With 5mm endometrial thickness as cut- off point , endometrial cytology has higher reliability and it substitutes traditional fractional curettage (Banczerowski M Wrobek [27] 2002 Nov ginekpol).Our study confirmed this finding pipelles diagnostic accuracy is better .Hysterectomy agreed with the histological methods. Positive predictive value with USG is 100% (Salet Lizee Gadennex P Nov 90-Oct 91).

Combination of trans vaginal sonogram and endometrial cytology in diagnosing cancer had a sensitivity of 100% and specificity 99% positive predictive value 99.3% negative predictive value of 100% (Minagawa Ys, at S, Ito M.Omata Y in 2005).[42]

# SUMMARY

This present prospective study analyzing the combined role of trans vaginal sonography and aspiration cytology of endometrium in postmenopausal bleeding was carried out at Govt Kasturbha Gandhi Hospital, Madras Medical College during the period of October 2003 to November 2005.

A total of 150 patients were included in the study All the patients underwent an initial assessment with trans vaginal sonography followed by aspiration cytology of endometrium and fractional curettage with the aim of obtaining a pathological diagnosis All patients with abnormal findings and those coming under the category described earlier , subsequently underwent hysterectomy .The final diagnosis obtained after hysterectomy was designated as the gold standard against which the findings of transvaginal sonography and aspiration cytology of endometrium were compared and analysed for statistical significance

**Observations in the study includes**

- Patients in the study group ranged from 40-70 years with 69.3% of them belonging to 50-60 years.
- The study encompasses parous women with majority of them belonging to low socio economic status.
- Most of the women (88.7%) had presented with in 6 months of onset of complaints

- Both trans vaginal sonography and aspiration cytology of endometrium produce statistically significant results while evaluating post menopausal bleeding (p=0.000)

- Trans vaginal sonogram showed a sensitivity of 76% and specificity of 92%

- Aspiration cytology of endometrium in diagnosing pathology showed a sensitivity of 84.6% and specificity of 97.1% which is equal to that of traditional fractional curettage.

- Aspiration cytology missed out the diagnosis of intraluminal pathology because of its blind nature

- Combining both transvaginal sonogram and aspiration cytology of endometrium in diagnosing endometrial pathology has better accuracy.

- Though transvaginal sonography identifies endometrial hyperplasia ,tissue diagnosis was necessary in these cases But it obviates the need for endometrial sampling in those cases where endometrium was less than 4 mm thickness

# CONCLUSION

- Transvaginal sonography is initially used to evaluate patients with post menopausal uterine bleeding.

- With more than 4 mm endometrial thickness as cut off, patients can be subjected to aspiration cytology of endometrium.

- Being an office procedure .aspiration cytology of endometrium ,it is better than traditional D&C in diagnosing endometrial pathology

- Aspiration cytology of endometrium is still unable to identify focal pathology which needs other diagnostic modalities such as saline infusion sonography or hysteroscopy

- Hence the combination of trans vaginal sonography and aspiration cytology of endometrium can be used in diagnosing post menopausal bleeding as an out patient procedure

# BIBLIOGRAPHY


1. Gynaecologic Oncology; Uterine Cancer; Novaks Gynaecology 13th edition2002; 1143-49
2. A clinical approach to Gynaecolgy ;special tests and accuracy aids to diagnosis ; Jeffcoates principles of GYNAECOLOGY 5th edition2001;11-14
3. Normal and abnormal uterine bleeding diagnostic approach to post menopausal bleeding;Telindes operative Gynaecology9th edition 2003;467-469
4. Grady D Gebretsadik T Karlikouske K et al Harmone replacement therapy and cancer risk ;a meta analysis Obstet Gynaecology 1995;85:304-313
5. Kurman RJ. Kamushi PF; Norrits, The behaviour of endometrial hyperplasia ; A long term study of untreated hyperplasia in 170 patients Cancer 1985;56;403-412
6. Guidelines for the management of abnormal uterine bleeding SOGC Clinical practical guidelines no 106, August 2001
7. Guido RS, Kanbour Shakir A, Rulin MC, Christopherson WA Pipelle endometrial sampling ; Sensitivity in the detection of endometrial cancer JREPROD Med 1995;33: 76-8
8. Ferry JfarnsworthA Webster.M WrenB The efficacy of pipelle endometrial biopsy in detecting endometrial cancer Aust N .ZJ Obstetrics Gynaecology 1993;33;76-8
9. Grimes D Diagnostic dilatation and curettage ;a reappraisal ;Am J Obstetrics Gynaecol 1982;142:1-6
10. Mackenzie I Bibby J Critical assessment of dilatation and curettage in 1029 women Lancet 1978 ;2: 566-8Vercellini P, Cortesi I. Oldani S, Moschetta M , Di Georgi O, Crosignani PG.The role of trans vaginal ultrasonography and out

patient diagnostic hysteroscopy in the evaluation of patients with menorrhagia Hum Reprod 1997;12:1768-71

11. Smith Bindman R,Karlikouske K ,Feldstein v, Subak L,ScheilderJ Segal M et al Endovaginal ultrasound to exclude endometrial cancer and other endometrial abnormalities Jam Med Assoc 1998;280:1510-7

12. Tsuda H Kawabata M .Yamamoto K. Inoue T.Umesaki N .Prospective study to compare endometrial cytology and trans vaginal ultrasonography for identification of endometrial malignancies Gynaec Oncol 1997;65:383-6

13. Varner KE Sparks JM . Cameron CD et al ,Transvaginal sonography of the endometrium in the post menopausal women Obstet Gynaec 1991;78:195-99

14. Schoenfield Alevavi H, Hirsch M , PardoJ, Wadio J Trans vaginal sonography in post menopausal women J Clinical ultrasound 1990;18;350-58

15. GoldsteinSR,etal Ultrasonography based triage for perimenopausal patients with abnormal uterine bleeding American Journal of Obstetrics and Gynaecology , 1997;177(1):102-8

16. Vuopala S Diagnostic accuracy and clinical applicability of cytological and histological methods for investigating endometrial carcinoma Acta Obstet GynaecScand suppl 1997 ;70:1

17. Kaunitz AM, Masciello AS, Ostrowsym. Rovvira EZ Comparision of endometrial pipelle and vabra aspirator J Reprod Med 1988. 33: 427-31

18. Rodriguez MJ, Platt LD , Medearris AL,Lecarra M, Lobo RA .The use of trans vaginal sonography for evaluation of post menopausal size and morphology Am J Obstet Gynaec 1988;159 810-14

19. Goldschmit R Katz A ,Blickstein I,Caspi B, Dgani R The accuracy of endometrial sampling with and without sonographic measurement of endometrial thickness Obstet Gynaec 1993;82; 727-30

20. Nasri MN, Coasi GJ correlation of ULTRASOUND FINDINGS AND ENDOMETRIAL HISTOPATHOLOGY IN POST MENOPAUSAL women Br J Obst GYNAEC 1989;96 1333-8

21. Granberg S Wikland M kARLSSONb ,Norstroom A,Firberg LA Endometrial thicknes as measured by endovaginal in detecting uterine abnormality Am J Obstet gynaec 1991; 164 ; 47-52

22. Langer RD ,Pierce JJ .O Hanlan KA, Johnson SR, Espeland MA, Trabal JF, Barnabei VM , Merino MJ Scully RE Transvaginal ultrasonography compared with endometrial biopsy for detection of endometrial disease Postmenopausal estrogen progesterone intervention trial N Engl J Mes 1997;337;1792-8

23. Ferazzi V ,Torri V, Trio D, et al Sonographic endometrial thickness. Auseful test to predict atrophy in patients with post menopausal bleeding An Italian multicentered study Ultrasound Obstet gynaec 7;315-321 ;1996

24. Fleischer AC, Wheeler JE , Lindsay L et al An assessment of value of ultrasound screening for endometrial disease in post menopausal women without symptome Am J O bs gynaec,184,70-74 ,2001

25. Kufatil J Pedrson Sindberg 1997sep 6 .A comparitive study of trans vaginal ultrasound sampled by gynaescann and histology by uterine explora curette with histology of uterine specimen

26. Banzcerowska M, Wrobe A ‘ Suchoki S, assessment of different methods in diagnosing endometrial cancer (2002 NovGinekpol )

27. Jansen JG Vacuum curettage out patient curettage without anaesthesia a report of 350 cases Dan Med Bull 1970 ; 17:199

28. Kelly HA. Curettage without anaesthesia on the office table Am J Obs Gyn 1925 ; 9;78

29. Lutz MH, Underwood PB Jr, Kreutner A ,et al Vaccum aspiration : an efficient out patient screening for endometrial disease South Med J 1977;70 :393

30. Sand mire HE, Austin SD , Curettage as an office procedure Am Obs Gyna 1974; 119 ;82

31. Chambers JT, Chambers SK, endometrial sampling When? Where? Why? With ? what? Clinic obs gynaec 1992; 35;28-39

32. Gimpleson RJ, Rappold Ho A comparitive study between panoramic hysterectomy with directed biopsies and dilatation and curettage a review of 276 cases AmJ Obs Gyn 1988;158;489-92

33. Stovall TG, Ling FW .Morgan PL A prospective randomized comparision of pipelle em sampling device with Novak curette Am J obs GYNAEC 1991;165 : 1287-9

34. vanden Bosch t, Vandendael a, VanSchoubroueck D ,Wranz pa, Lombard CJ,combining vaginal sonography and office endometrial biopsy in the diagnosis of endometrial disease in post meno;85:349-52

35. Obst Gynaec 1995.Stovall TG Wotopolus PJ Poston WM Ling FW Sandles LG Pipelle endometrial sampling in patients with known endometrial cancer Obste Gynaec 1991;77;954-56

36. Dodson MG Use of trans vaginal ultrasound in diagnosing etiology of menorrhagia J Reprod MED 1994 ;39;362 –72

37. Karrlson B, Granberg G , wikland B, Ylosato P, Torvid K, Marsal K, Valentin L Transvaginal ultrasound in women with post menopausal bleeding A Nordic multicenter study Am J OBS GYNA 1995; 172;1488-94

38. Tongsong t, pongnansorn C ,Mahanuphap P use of trans vaginal sonographic measurement of endometrial thickness in identification of abnormal

endometrium in peri and post menopausal bleeding J Clinic Ultra sound 1994;22: 479 –82

39. Loffler FD hysteroscopy with selective endometrial sampling compared with D& c FOR ABNORMAL UTERINE BLEEDING The value of negative hysteroscopic view Obstet gynaec 1989 ;73 :16-20

40. Bruchim I Biron Shental T Alteras M Metal combination of endo metrial thickness and time since menopause in predicting endometrial cancer in women with postmenopausal bleeding J Clin ultrasound 32 (5) :219 –24 ,2004

41. Minagawa Y Saoto S ,Ito M, Omato Y comparitive study to determine whether TVS USG , endometrial cytology is an effective diagnostic screening for endometrial cancer and hyperplasia 2005

42. Kufahl J Pedrson Sindberg. Comparitive study of trans vaginal ultrasonogram , endometrium sampled by GYNOSCANN and histology obtained by uterine explora curette and histology of uterine specimen 1997 sep 6

43. Gull B Karrlson B, Milsonet et al A longitudinal evaluation of post menopausal bleeding and transvaginal sonography of endometrial thickness as a predictor of endometrial ca 2003

# PROFORMA

Name Age I.P No

Occupation Socioeconomic status

Address

Married since

Para Live

Last child birth

Menopause When and how long

PRESENTING COMPLAINS

Bleeding

Onset

Duration

Pattern continuous / intermittent

Diapers per day

Passing clots Yes / No

White discharge

Scanty /Profuse

Colour

Blood stained Yes / No

Foul smelling Yes / No

Itching

Post coital bleeding Yes / No

Abdominal pain Yes / No

If Yes, Is there any aggravating factors
relieving factors

Urinary symptoms Yes / No

Any prior OC pills intake

PAST MENSTRUAL HISTORY

Cycle length

Regular

How many pads per day

Associated with dysmenorrhoa

Clots

MARITAL AND OBSTETRIC HISTORY

Married since

Para

NOC

LCB

Abortion - spontaneous / induced

CONTRACEPTION HISTORY

Use of contraception Yes / No

Permanent / Temporary

Permanent

PS

MTP with TAT

MTP with Laparoscopic sterlisation

Interval Laparoscopic sterlisation

PAST MEDICAL AND SURGICAL HISTORY

HT / DM / BA / TB / BLEEDING DISORDER

Any abdominal surgeries Yes / No

Similar complains in the past Yes / No

CLINICAL EXAMINATION

Height

Weight

Built

Nourishment

Anemia

Pedal edema

Thyroid

Breasts

VITALS HR RR BP

P/A

S/E

P/V

Other systems

INVESTIGATIONS

Urine R/E

CHG

Sugar

Urea/ creatinine

X ray chest

ECG

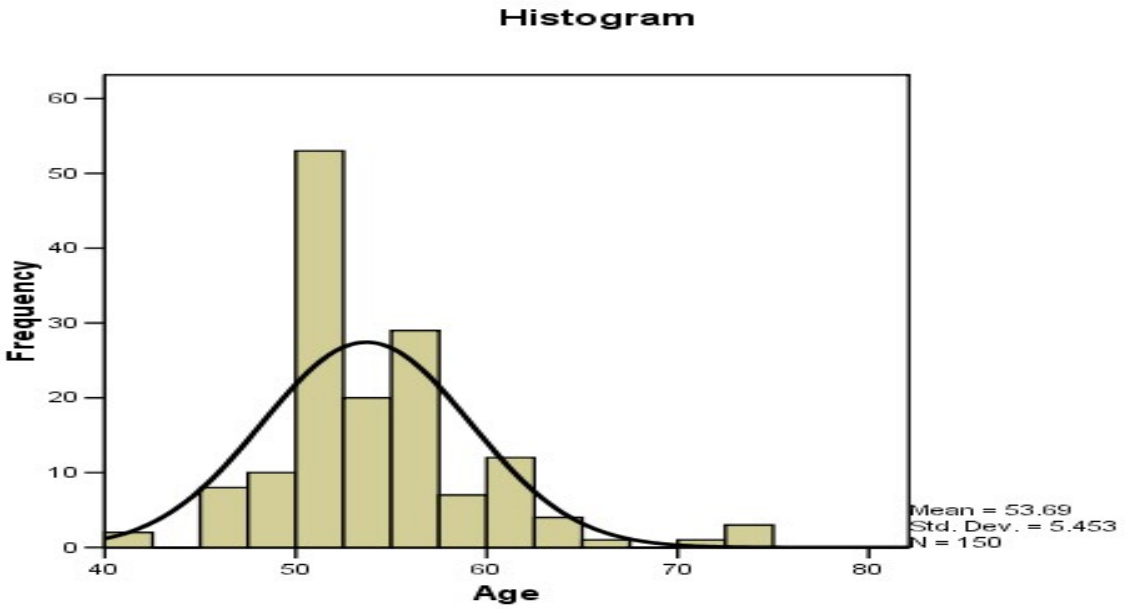
TVS

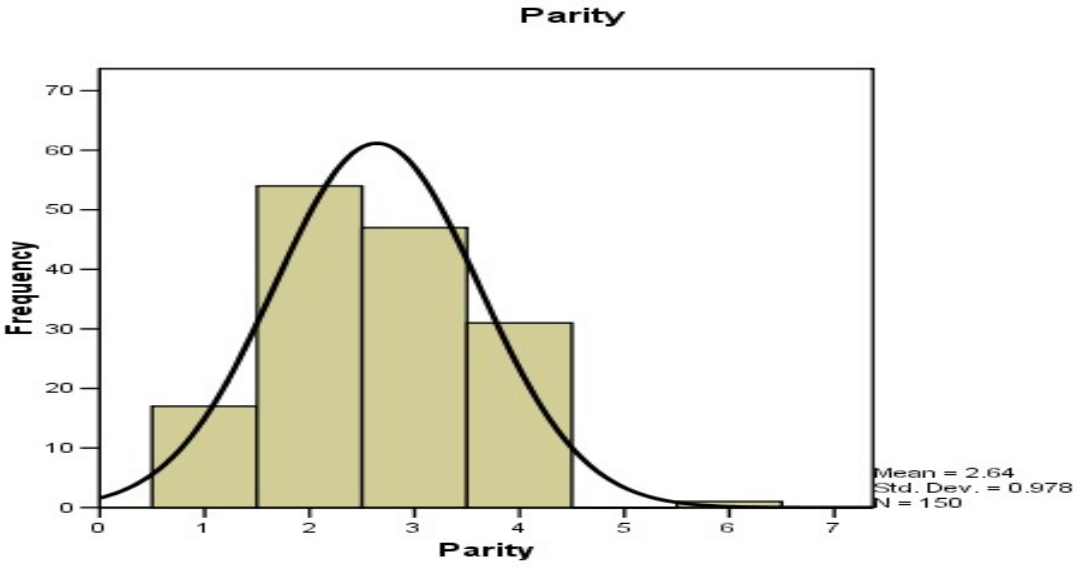
SIS

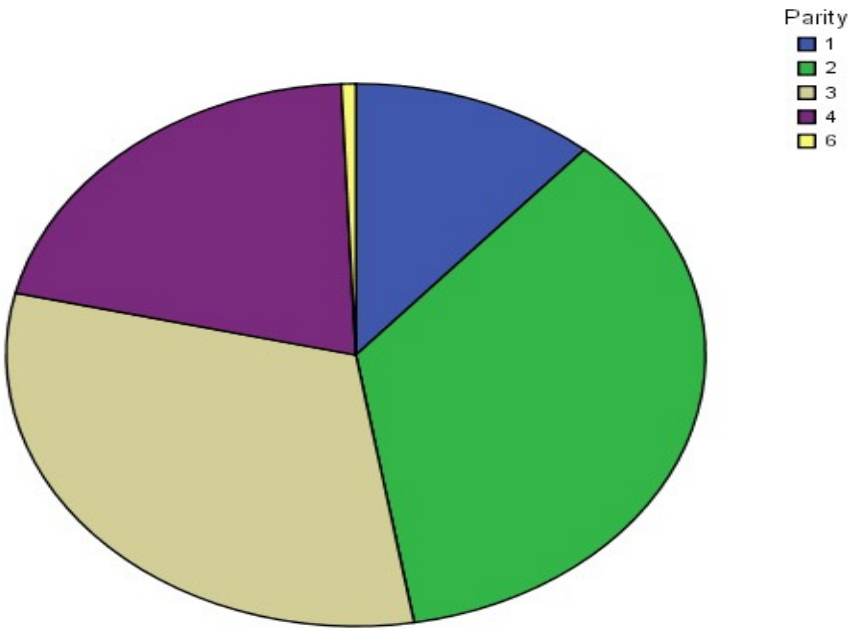
Endometrium study

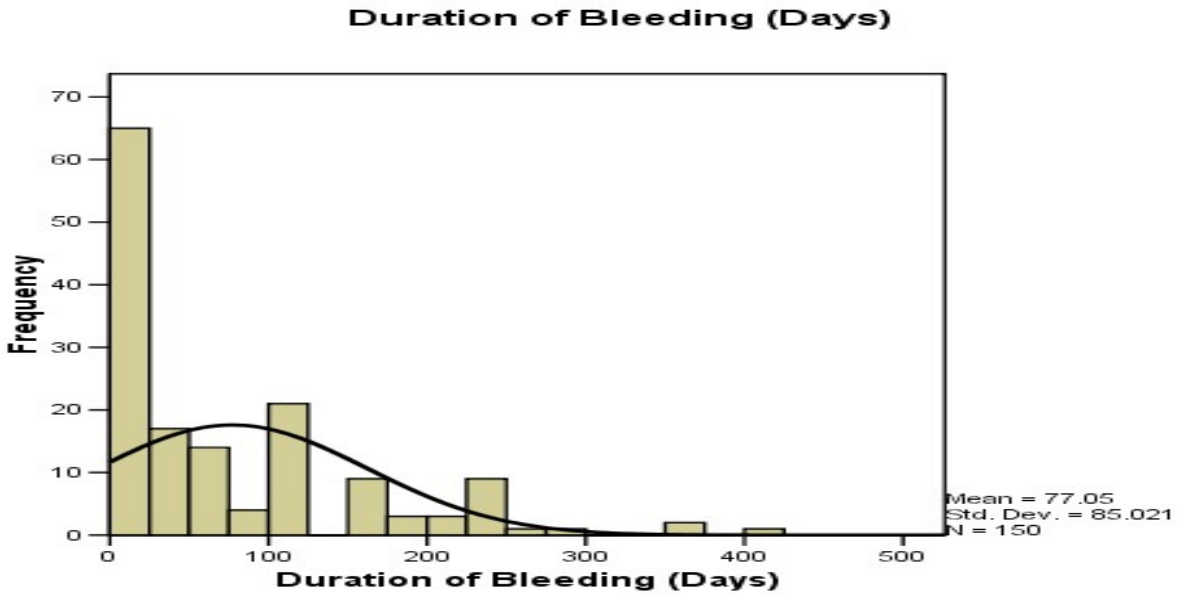
Hysterectomy

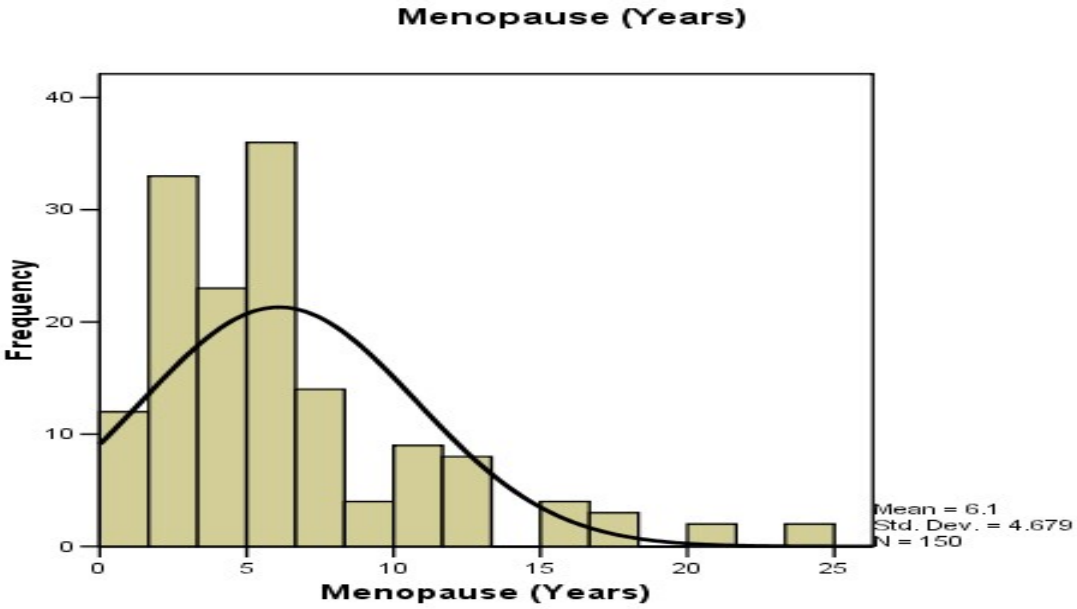
Yes- finding

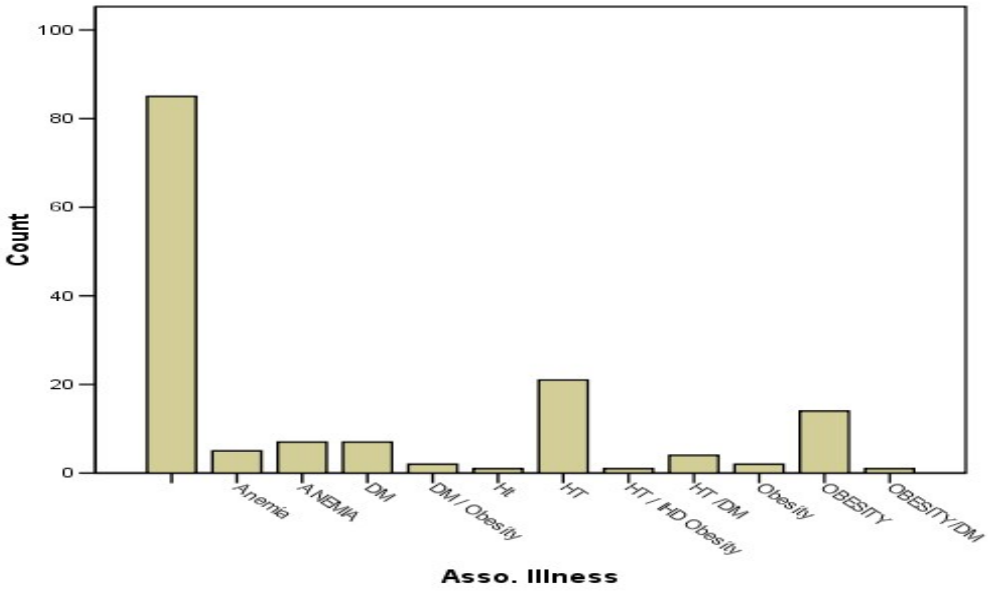

Histogram
Frequency
Age
Mean = 53.69
Std. Dev. = 5.453
N = 150

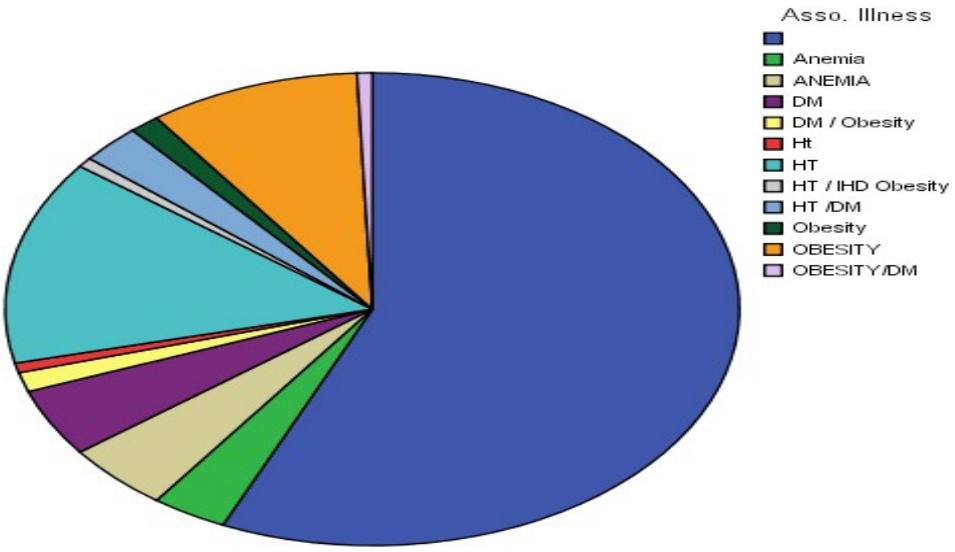

Parity
Frequency
Parity
Mean = 2.64
Std. Dev. = 0.978
N = 150

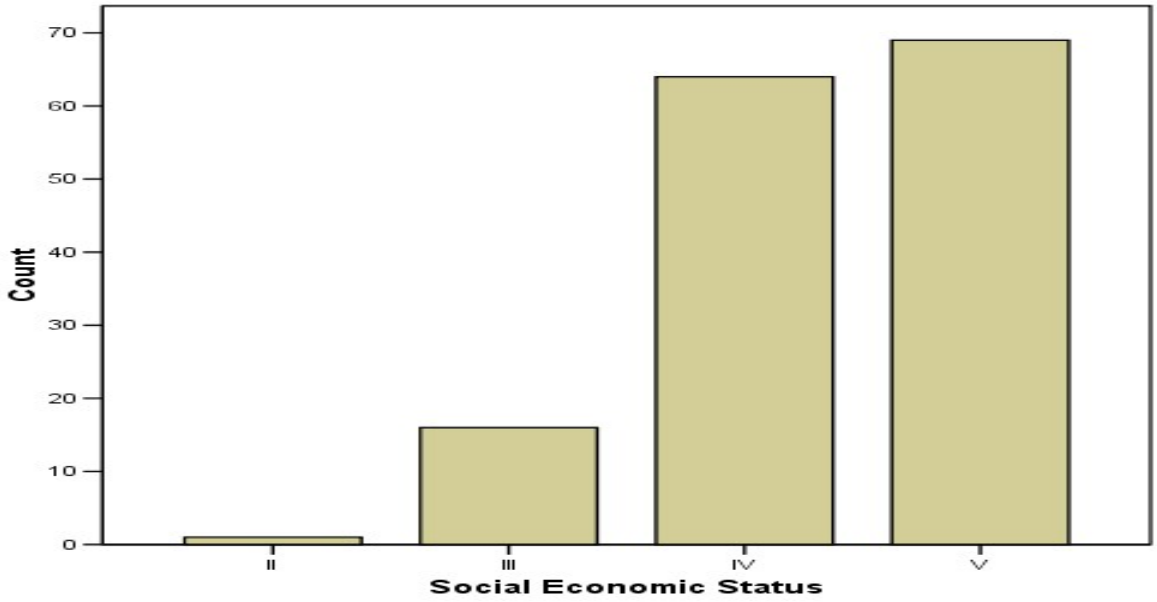

Parity
1
2
3
4
6

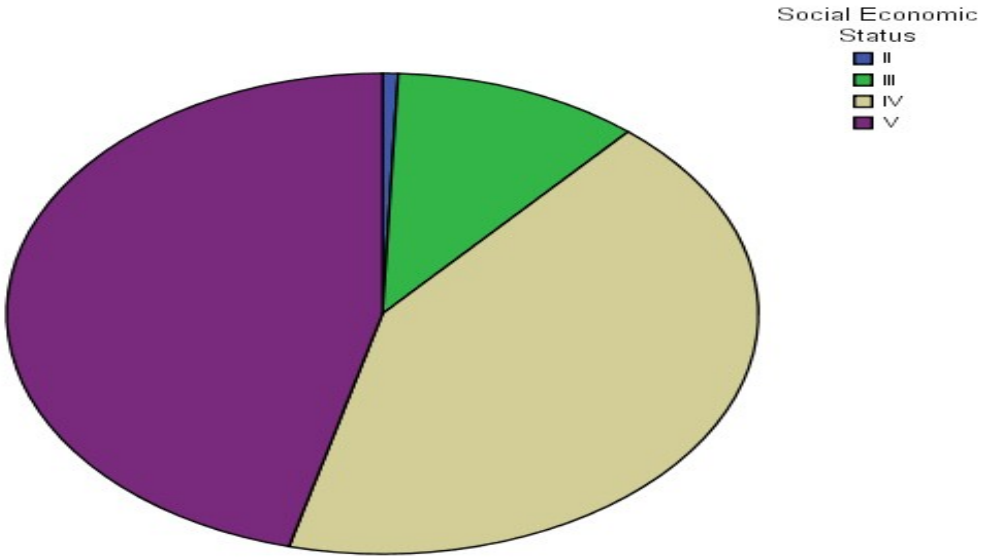

Duration of Bleeding (Days)
Frequency
70
60
50
40
30
20
10
0
0
100
200
300
400
500
Duration of Bleeding (Days)
Mean = 77.05
Std. Dev. = 85.021
N = 150

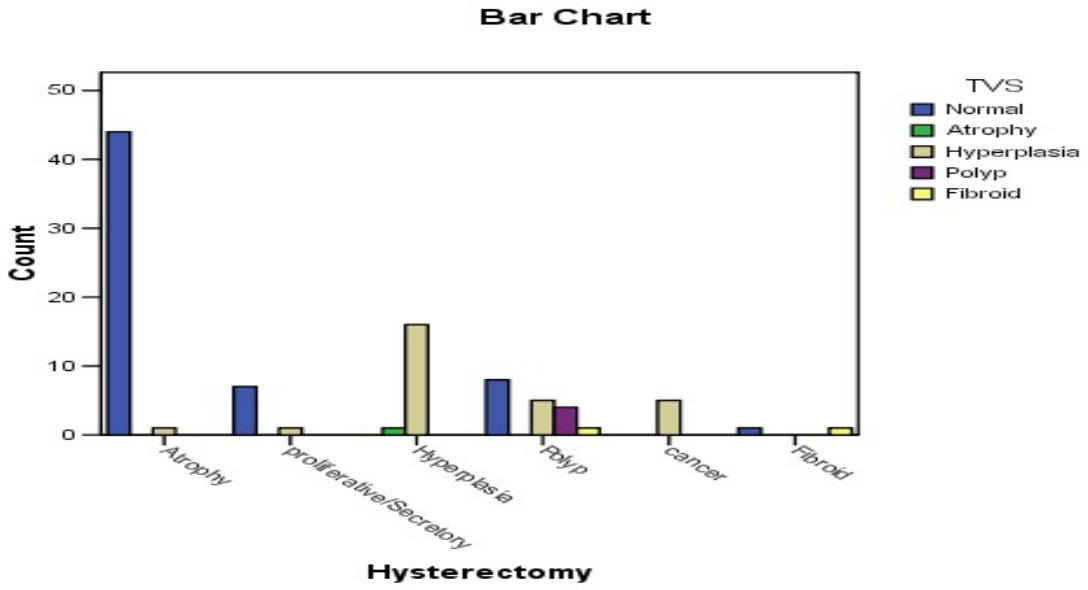

Menopause (Years)
Frequency
40
30
20
10
0
0
5
10
15
20
25
Menopause (Years)
Mean = 6.1
Std. Dev. = 4.679
N = 150

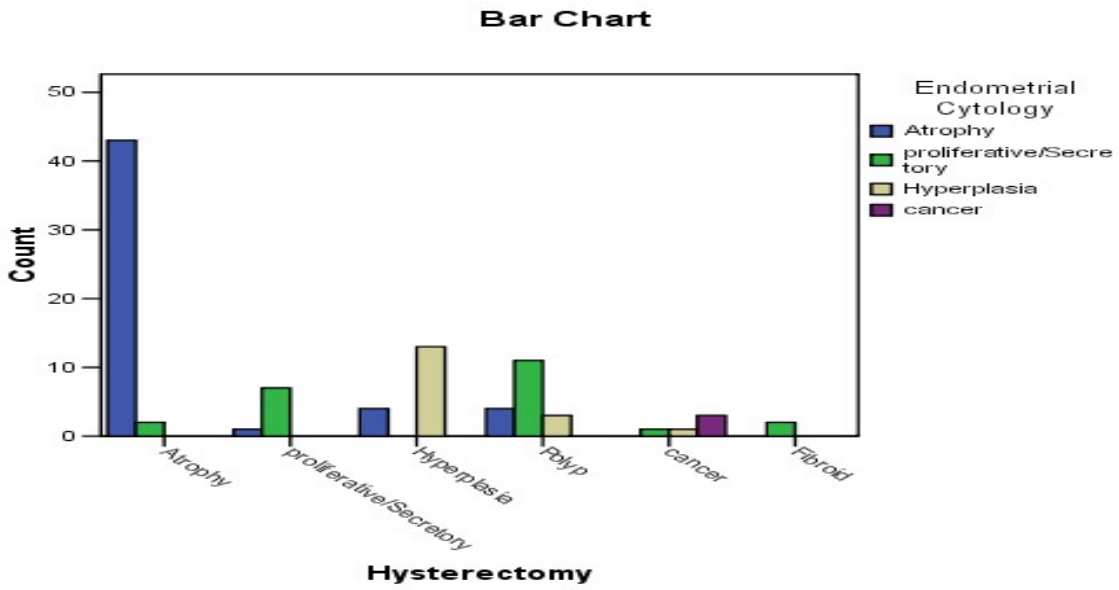

100
80
60
40
20
0
Count
Anemia
ANEMIA
DM
DM / Obesity
Ht
HT
HT / IHD Obesity
HT /DM
Obesity
OBESITY
OBESITY/DM
Asso. Illness

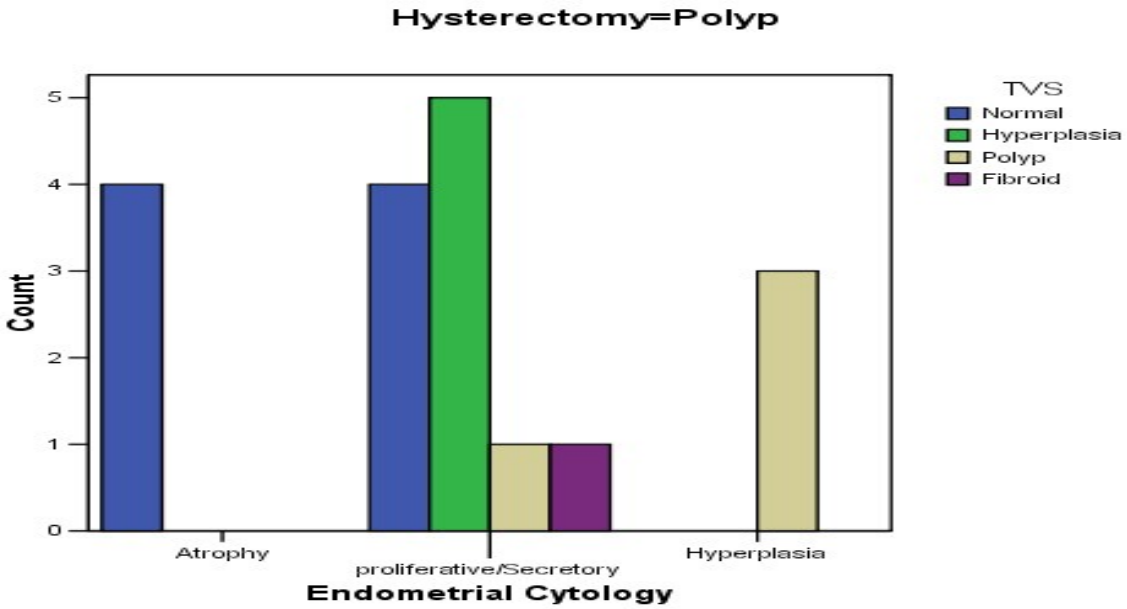

Asso. Illness
Anemia
ANEMIA
DM
DM / Obesity
Ht
HT
HT / IHD Obesity
HT /DM
Obesity
OBESITY
OBESITY/DM

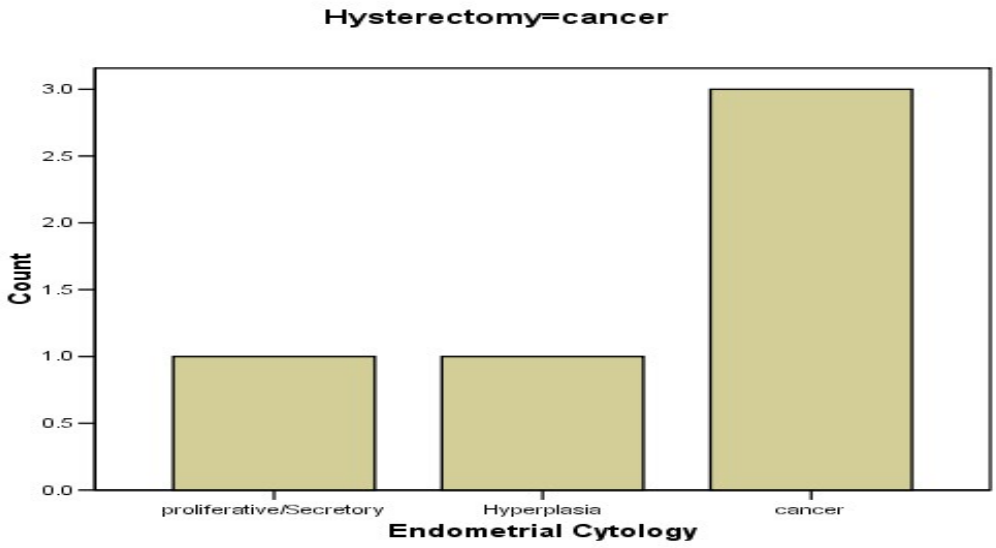

70
60
50
40
30
20
10
0
Count
II
III
IV
V
Social Economic Status

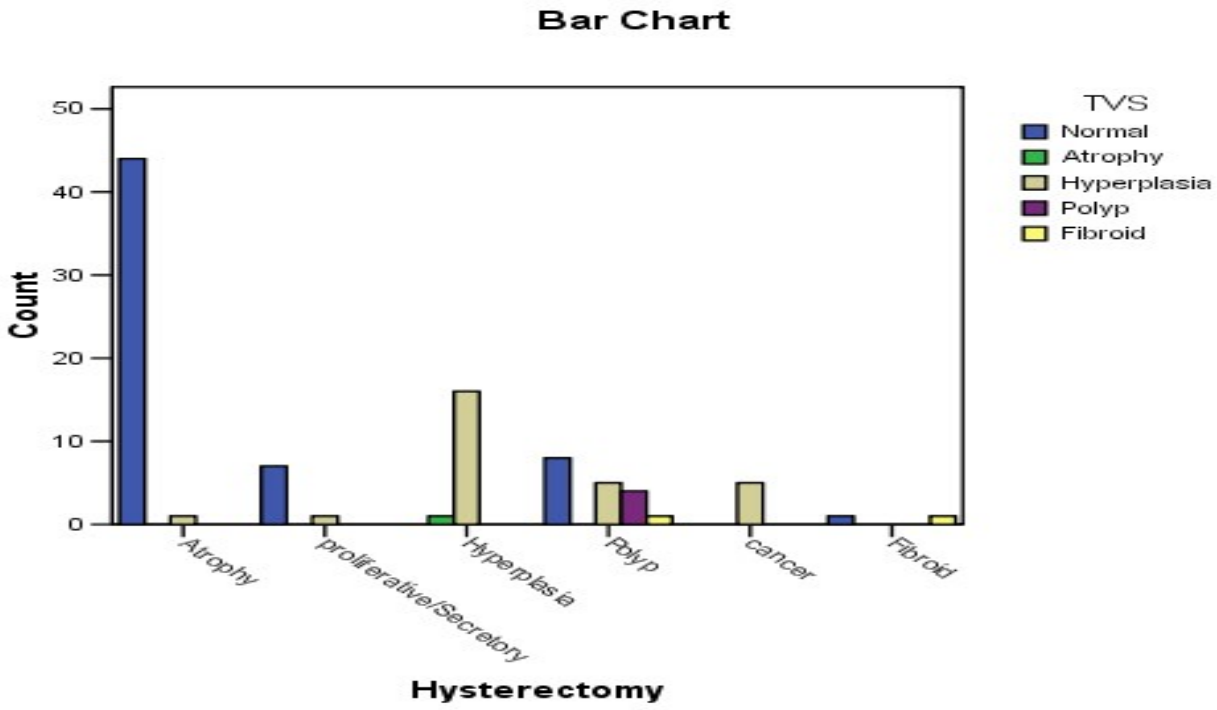

Social Economic Status
II
III
IV
V

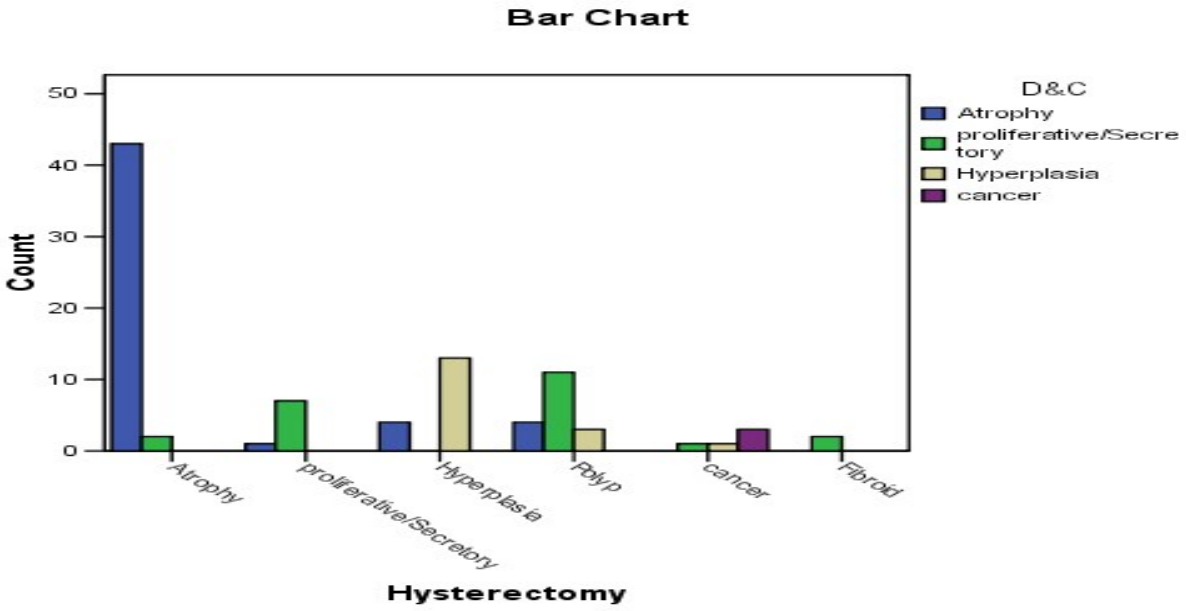

Bar Chart
TVS
Normal
Atrophy
Hyperplasia
Polyp
Fibroid
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Hyperplasia
Polyp
cancer
Fibroid
Hysterectomy

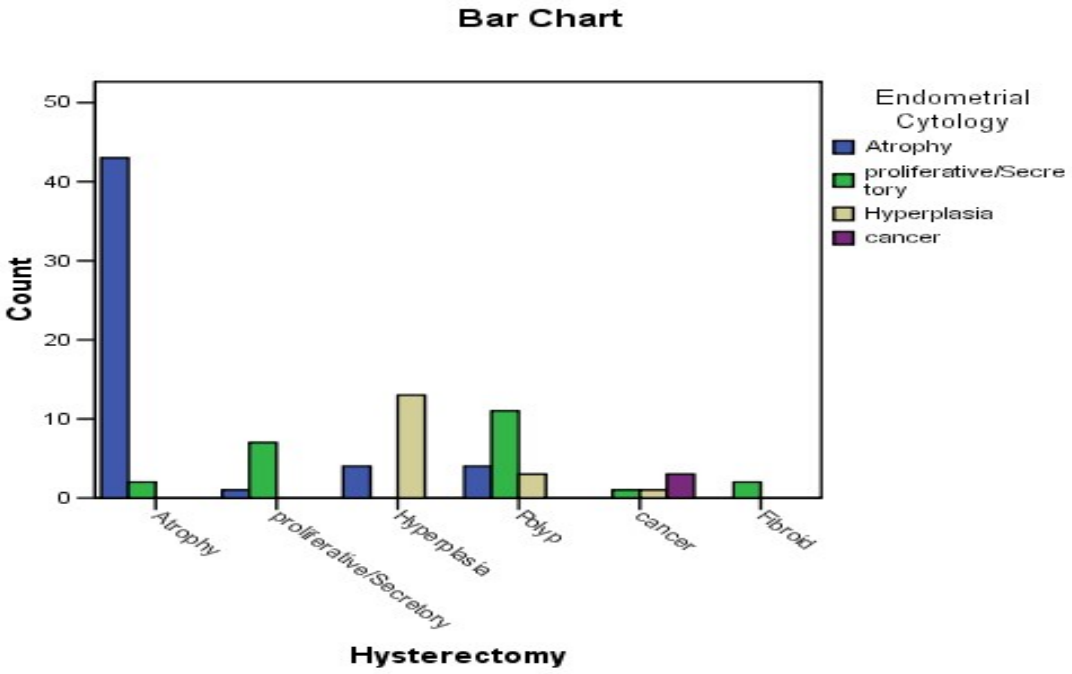

Bar Chart
Endometrial Cytology
Atrophy
proliferative/Secretory
Hyperplasia
cancer
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Hyperplasia
Polyp
cancer
Fibroid
Hysterectomy

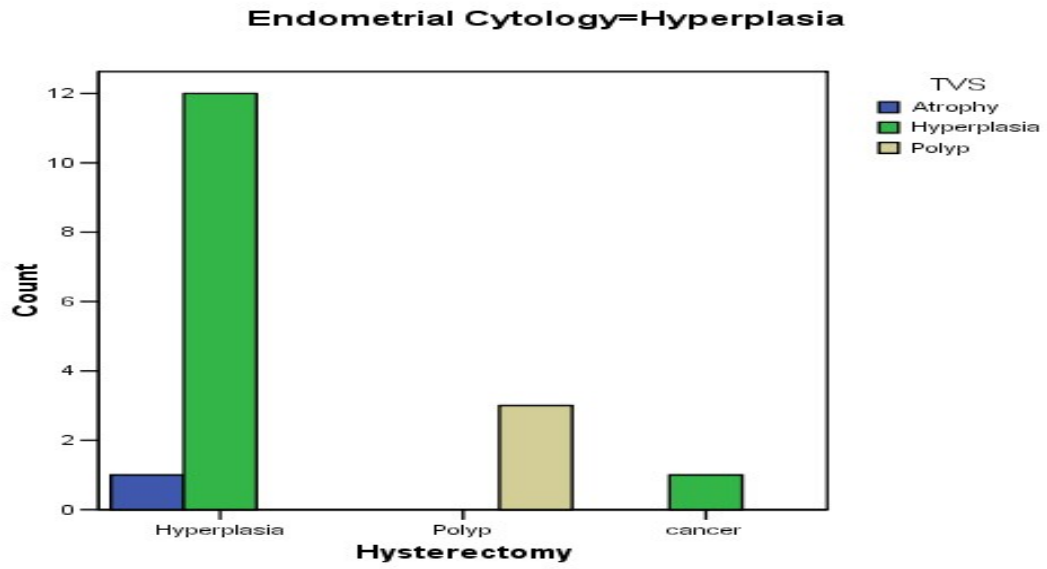

Hysterectomy=Polyp
TVS
Normal
Hyperplasia
Polyp
Fibroid
Count
5
4
3
2
1
0
Atrophy
proliferative/Secretory
Hyperplasia
Endometrial Cytology

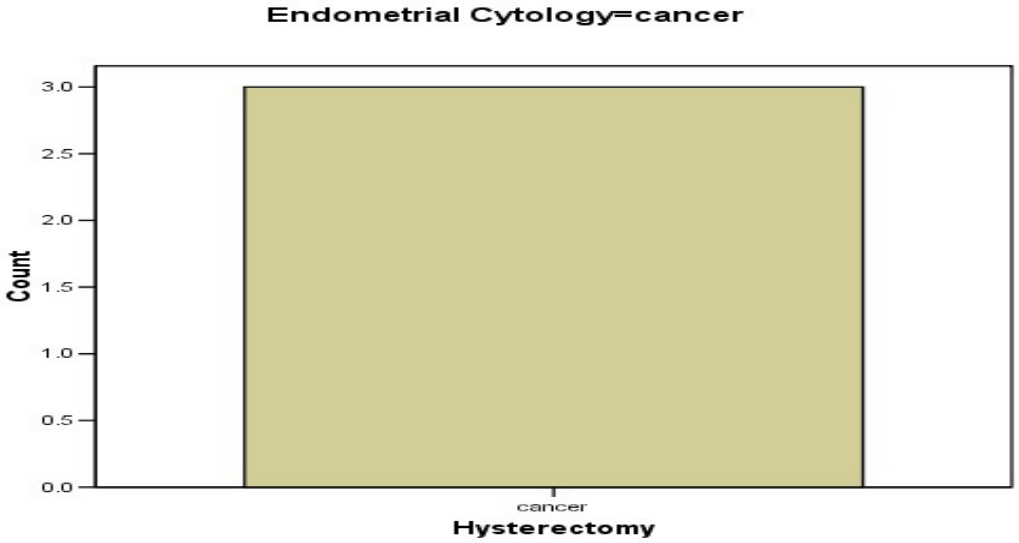

Hysterectomy=cancer
Count
3.0
2.5
2.0
1.5
1.0
0.5
0.0
proliferative/Secretory
Hyperplasia
cancer
Endometrial Cytology

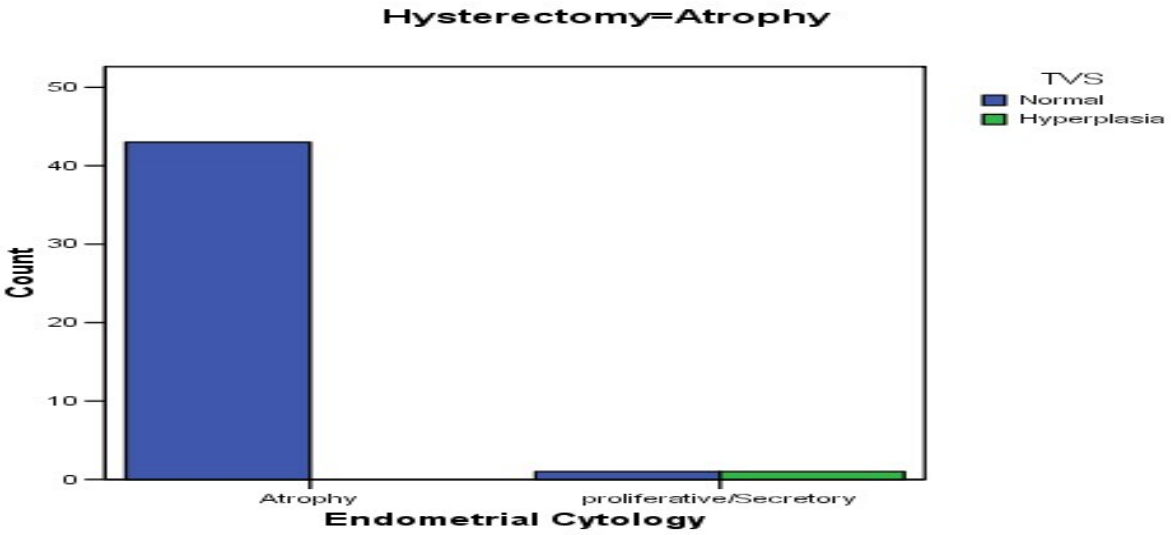

Bar Chart
TVS
Normal
Atrophy
Hyperplasia
Polyp
Fibroid
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Hyperplasia
Polyp
cancer
Fibroid
Hysterectomy

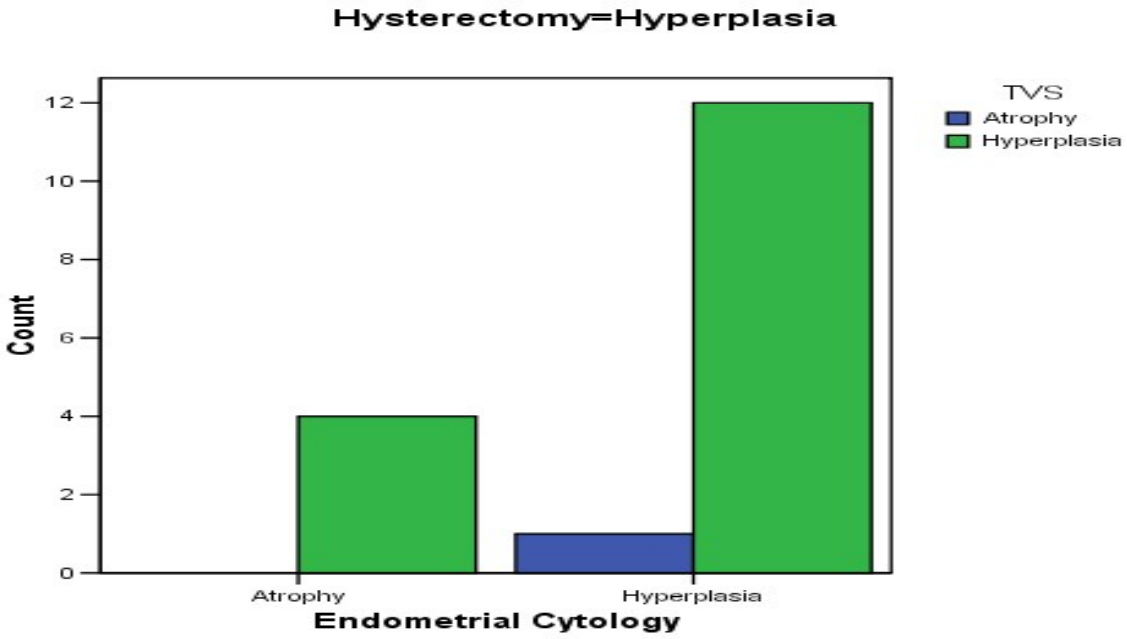

Bar Chart
D&C
Atrophy
proliferative/Secretory
Hyperplasia
cancer
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Hyperplasia
Polyp
cancer
Fibroid
Hysterectomy

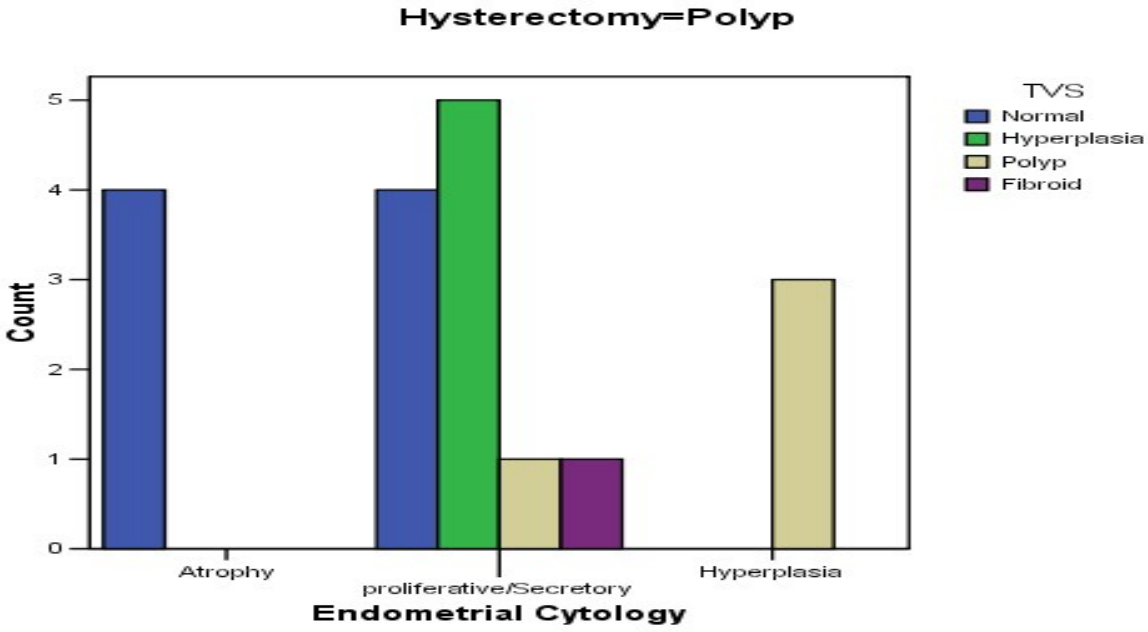

Bar Chart
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Hyperplasia
Polyp
cancer
Fibroid
Hysterectomy
Endometrial Cytology
Atrophy
proliferative/Secretory
Hyperplasia
cancer

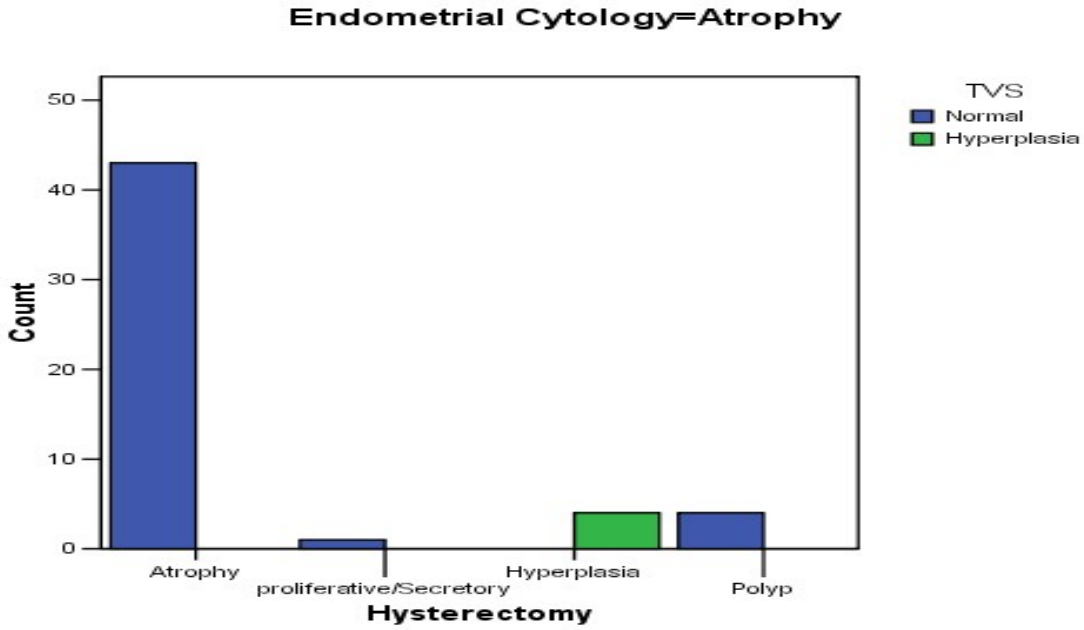

Endometrial Cytology=Hyperplasia
TVS
Atrophy
Hyperplasia
Polyp
Count
12
10
8
6
4
2
0
Hyperplasia
Polyp
cancer
Hysterectomy

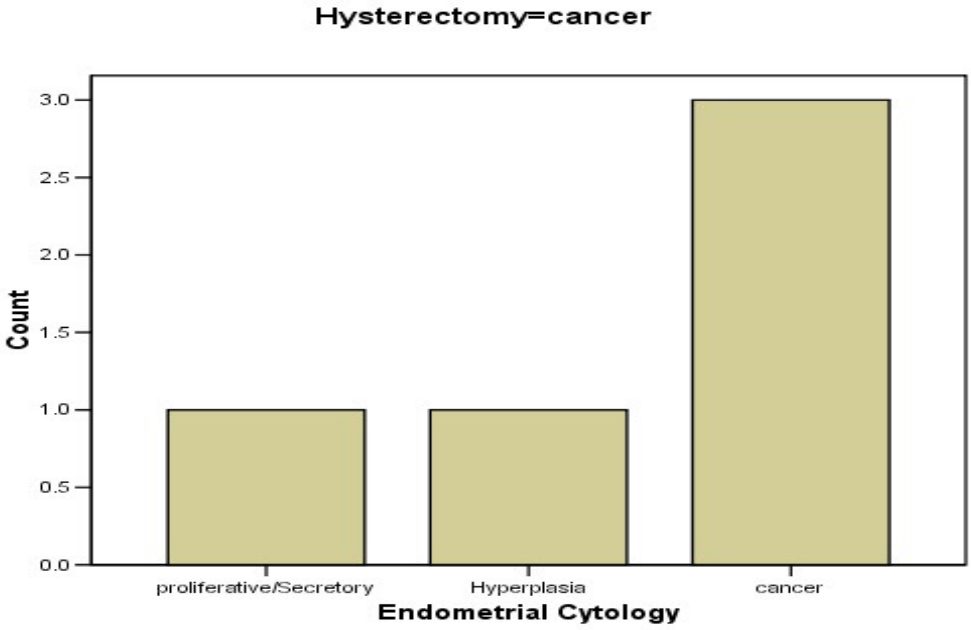

Endometrial Cytology=cancer
Count
3.0
2.5
2.0
1.5
1.0
0.5
0.0
cancer
Hysterectomy

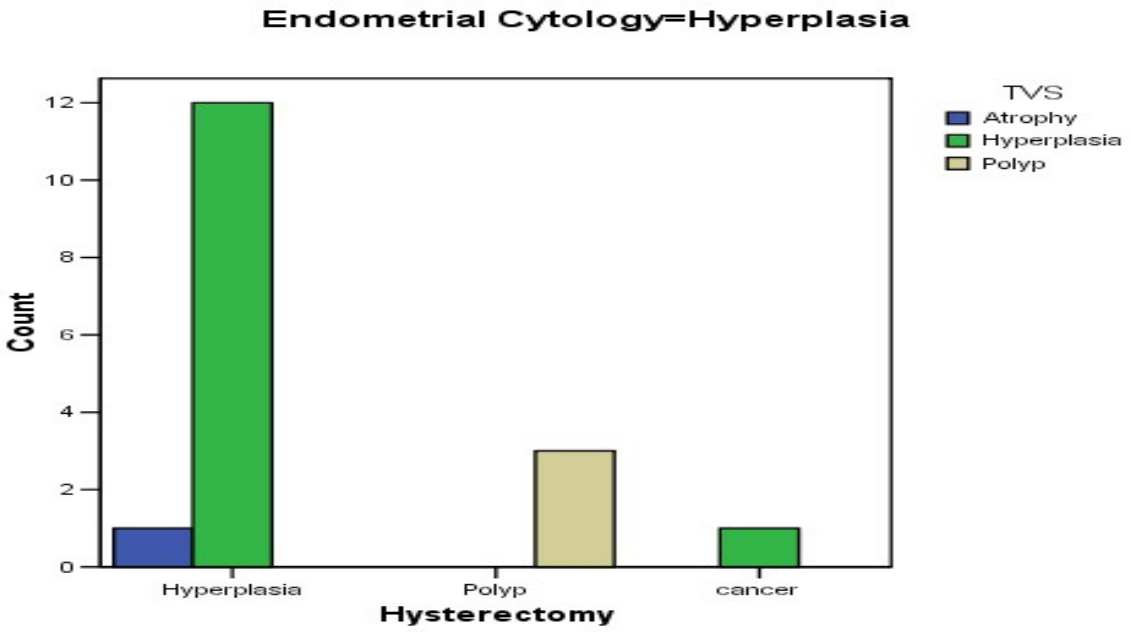

Hysterectomy=Atrophy
TVS
Normal
Hyperplasia
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Endometrial Cytology

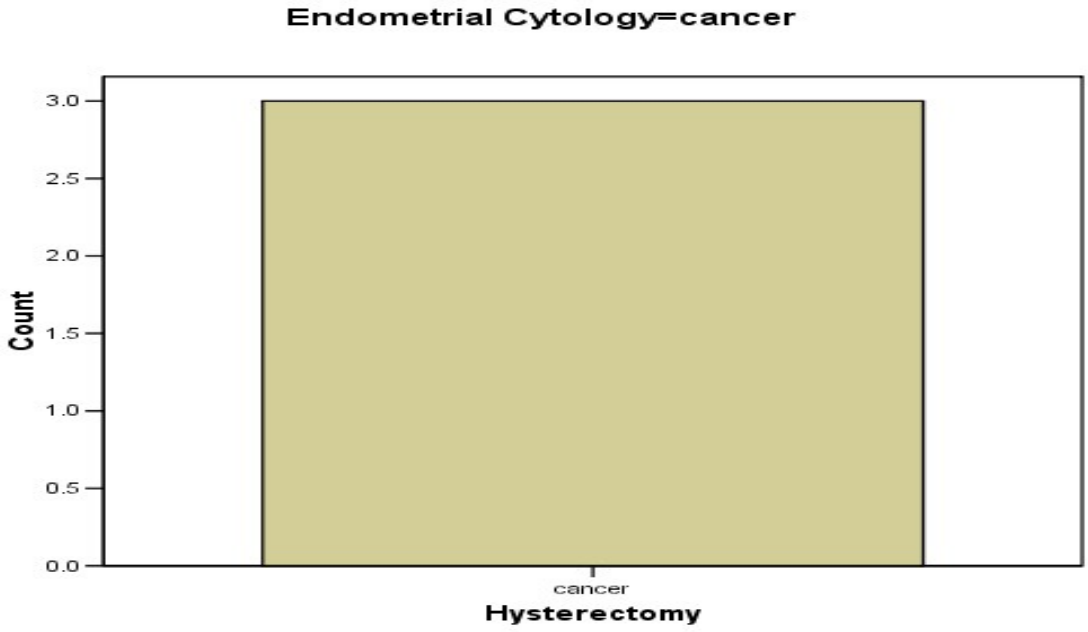

Hysterectomy=Hyperplasia
TVS
Atrophy
Hyperplasia
Count
12
10
8
6
4
2
0
Atrophy
Hyperplasia
Endometrial Cytology

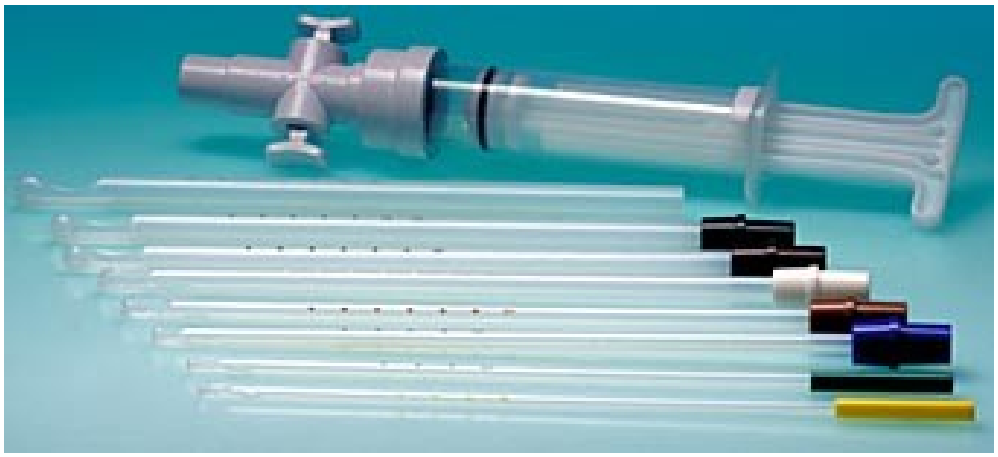

Hysterectomy=Polyp
Count
5
4
3
2
1
0
Atrophy
proliferative/Secretory
Hyperplasia
Endometrial Cytology
TVS
Normal
Hyperplasia
Polyp
Fibroid


Endometrial Cytology=Atrophy
Count
50
40
30
20
10
0
Atrophy
proliferative/Secretory
Hyperplasia
Polyp
Hysterectomy
TVS
Normal
Hyperplasia

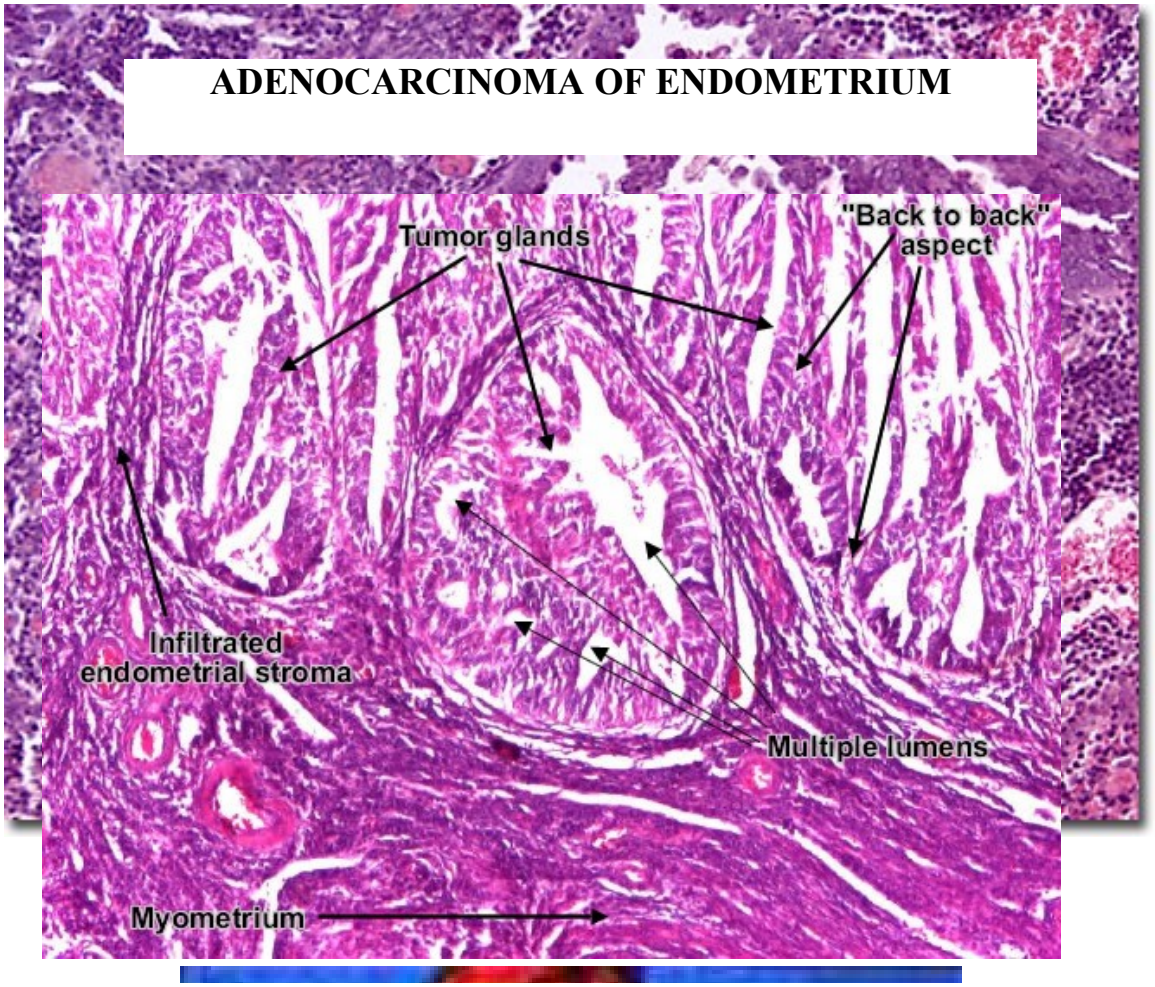

Hysterectomy=cancer
Count
3.0
2.5
2.0
1.5
1.0
0.5
0.0
proliferative/Secretory
Hyperplasia
cancer
Endometrial Cytology


Endometrial Cytology=Hyperplasia
TVS
Atrophy
Hyperplasia
Polyp
Count
12
10
8
6
4
2
0
Hyperplasia
Polyp
cancer
Hysterectomy

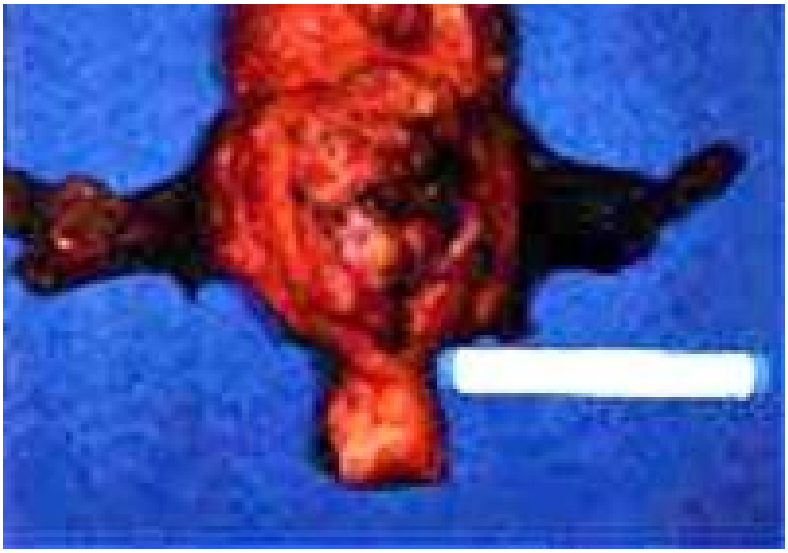

Endometrial Cytology=cancer
Count
3.0
2.5
2.0
1.5
1.0
0.5
0.0
cancer
Hysterectomy



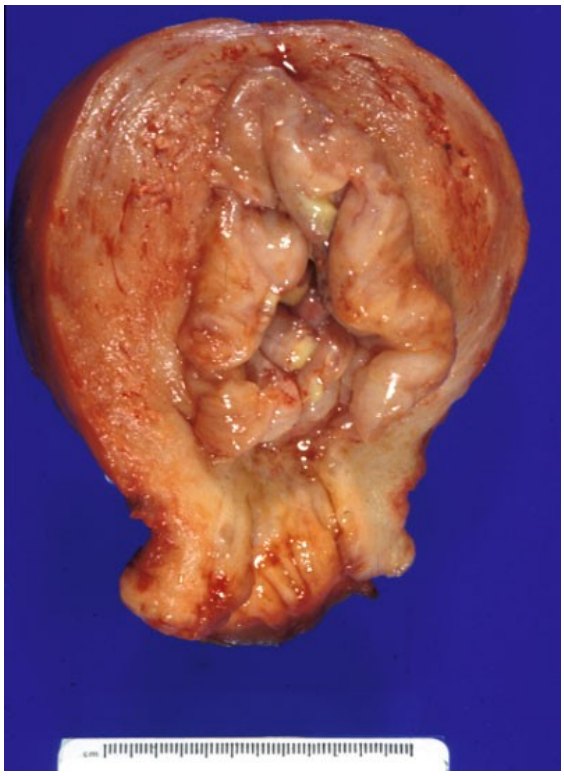
**MANUAL VACUUM ASPIRATOR**



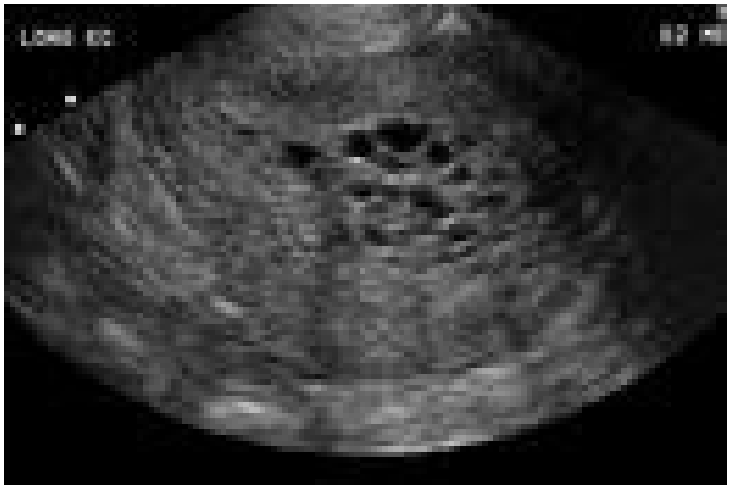

**ADENOCARCINOMA OF ENDOMETRIUM**



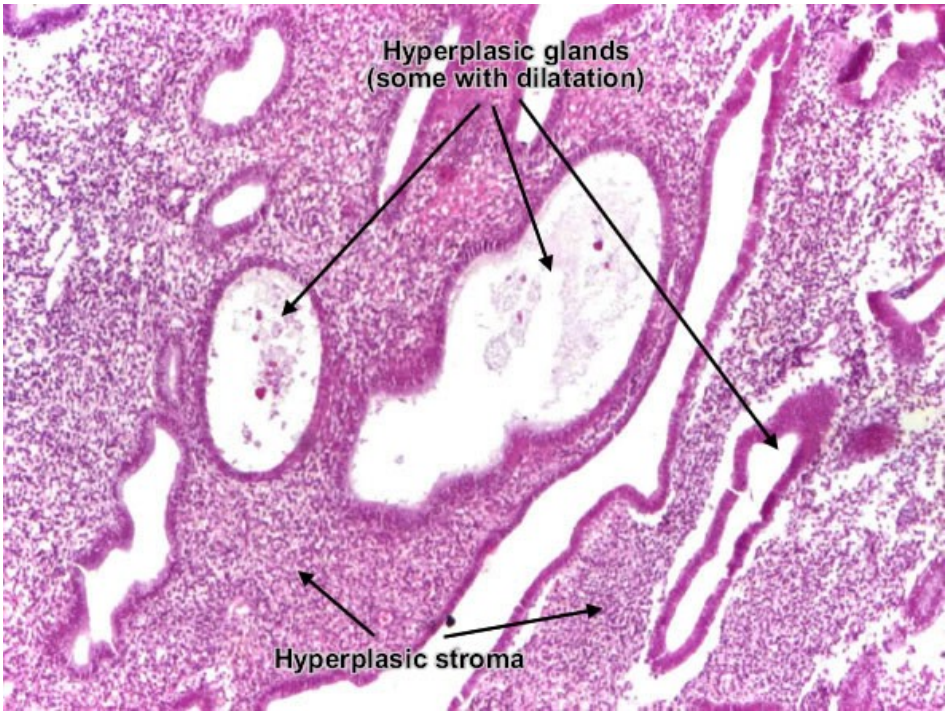
**CANCER ENDOMETRIUM**



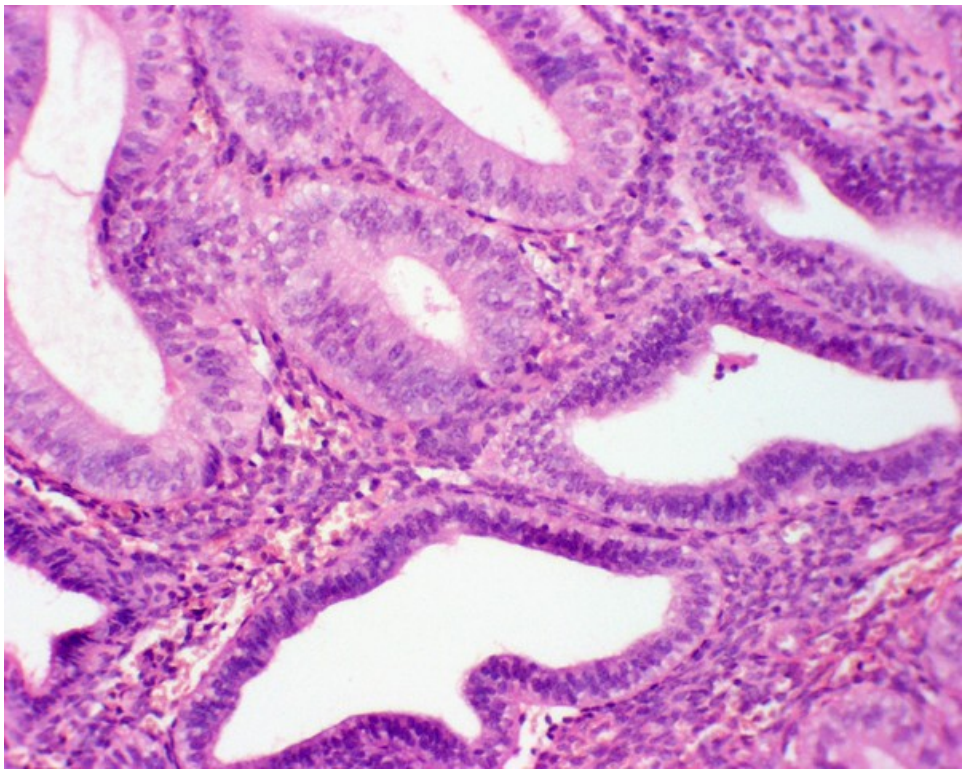
**ENDOMETRIAL HYPERPLASIA**



**ENDOMETRIAL HYPERPLASIA**




**ENDOMETRIAL HYPERPLASIA**



# ENDOMETRIAL POLYP