ROLE OF DIAGNOSTIC HYSTEROSCOPY IN EVALUATION OF ABNORMAL UTERINE BLEEDING IN WOMEN OF REPRODUCTIVE AGE GROUP AND ITS HISTOPATHOLOGICAL CORRELATION

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(BRANCH II)

THE TAMILNADU

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AUB D&C USG PMB HPE SIS TVS ET ACOG SHG HSG NPV PPV ABBREVIATIONS -Abnormal Uterine Bleeding -Dilatation and Currettage -Ultrasonogram -Postmenopausal Bleeding - Histopathological Examination -Saline Infusion Sonography - Transvaginal Ultrasonography - Endometrial Thickness -American College Of Obstetrics and Gynaecology -Sonohysterography - Hysterosalpingography -Negative Predictive Value -Positive Predictive Value FIGO -International Federation of Obstetrics and Gynaecology MRI -Magnetic Resonance Imaging ECG - Electrocardiogram TT -Tetanus Toxoid HIV -Human Immunodeficiency Virus VIA -Visual Inspection with Acetic acid VILI -Visual Inspection with Iodine CO2 -Carbondioxide. CONTENTS Serial...

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

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ABBREVIATIONS

AUB	-	Abnormal Uterine Bleeding
D&C	-	Dilatation and Currettage
USG	-	Ultrasonogram
PMB	-	Postmenopausal Bleeding
HPE	-	Histopathological Examination
SIS	-	Saline Infusion Sonography
TVS	-	Transvaginal Ultrasonography
ET	-	Endometrial Thickness
ACOG	-	American College Of Obstetrics and Gynaecology
SHG	-	Sonohysterography
HSG	-	Hysterosalpingography
NPV	-	Negative Predictive Value
PPV	-	Positive Predictive Value
FIGO	-	International Federation of Obstetrics and Gynaecology
MRI	-	Magnetic Resonance Imaging
ECG	-	Electrocardiogram
TT	-	Tetanus Toxoid
HIV	-	Human Immunodeficiency Virus
VIA	-	Visual Inspection with Acetic acid
VILI	-	Visual Inspection with Iodine
CO_2	-	Carbondioxide.

ROLE OF DIAGNOSTIC HYSTEROSCOPY IN EVALUATION OF ABNORMAL UTERINE BLEEDING IN WOMEN OF REPRODUCTIVE AGE GROUP AND ITS HISTOPATHOLOGICAL CORRELATION

ABSTRACT

BACKGROUND & OBJECTIVES: Abnormal uterine bleeding is the most common complaint in gynaecology and an important source of morbidity. This study evaluates the role of diagnostic hysteroscopy in the evaluation of Abnormal Uterine Bleeding in women of reproductive age group and its histopathological correlation.

METHODS: 50 patients with AUB who got admitted at Coimbatore Medical College Hospital in the Department of Obstetrics and Gynaecology were subjected to hysteroscopy and endometrial sampling. Histopathological analysis of the endometrial sample obtained. The hysteroscopic findings were correlated with the histopathology report.

RESULTS: AUB was more common in 40-49 yrs. The most common presenting complaint was Menorrhagia. Hysteroscopy was done successfully in all the patients. Abnormalities seen were endometrial hyperplasia (simple and complex), submucous myoma, and atrophic endometrium, proliferative phase and secretory phase. Hysteroscopy was found to be 100% sensitive and specific in diagnosis of endometrial

lesions. The positive predictive value was 100% for hysteroscopy in diagnosis of endometrial lesions.

CONCLUSION: This study confirms the conclusion of many others that hysteroscopy is an accurate and a feasible investigation in evaluating patients with Abnormal Uterine Bleeding.

Keywords: Hysteroscopy, D&C, Abnormal Uterine Bleeding, Histopathology.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Abnormal uterine bleeding is defined as any type of bleeding in which the duration, frequency or amount is excessive for an individual patient. One third of gynaecological consultation is due to Abnormal uterine bleeding (AUB). It is responsible for almost two-thirds of hysterectomies. [1-5,8-10] The prevalence of abnormal uterine bleeding (AUB) is estimated to be 11-13% in the general population. AUB affects 10-30% of reproductive age group women and upto 50% of women in perimenopausal age group.[49] Incidence varies with age and reproductive status of the women. Incidence increases with age, reaching 24% in those aged 36-40 years. [48] Endometrial sampling is considered essential in AUB to confirm the bening nature of the disease and excluding malignancy by histopathological examination. This is important to decide the treatment modality.

The problem is that uterine bleeding has a wide range of diagnostic possibilities and confusion is generated when review and reports fail to outline the diagnostic evaluation of the patient who presents with abnormal uterine bleeding. In normal to 12 week size uterus, the cause of abnormal bleeding often remains obscure. [49] Goals of clinical management are primarily dependent upon attaining a correct

etiological diagnosis. The history, physical examination and pelvic examination attempt to determine the site of the bleeding and its source. [8, 9,10] Information gathered from this will suggest what direction the investigation would take and the treatment modality. [9-13]

Traditionally Ultrasonography and Dilatation and Curettage were the most common investigations employed in the evaluation of the causes of abnormal uterine bleeding. Ultrasonography clearly depicts the uterine contour, any lesion in the myometrium like fibroid and the status of the ovary, but fails to provide adequate information regarding the endometrium. The endometrial pathology like small submucous fibroid, endometrial hyperplasia is missed sometimes by ultrasound. Dilatation and Curettage is a blind procedure done without knowing the exact location of the lesion or the pathology of the endometrium and the endometrium has to be sent to the pathologist to study histological patterns and for the report.

Hysteroscopy has ushered a new era in the evaluation of abnormal uterine bleeding.[1-10] By direct visualization of the uterine cavity it is able to pin point the etiology in majority of the cases. It can accurately detect endometrial hyperplasia and aids in the early diagnosis of endometrial carcinoma and uterine polyps. The judicious use of hysteroscopy to manage this medical entity adds a new dimension in

handling this often perplexing problem. This study has been taken up to analyze the role of hysteroscopy in the evaluation of Abnormal Uterine Bleeding in terms of accuracy of hysteroscopic findings and contribution of the procedure to clinical diagnosis. It also aims to correlate hysteroscopic findings with histopathological results. The patients included are in the reproductive age group.

AIM AND OBJECTIVE

1. To identify the cause of abnormal uterine bleeding in patients with AUB.
2. To identify any endometrial lesions like polyp or fibroid.
3. To evaluate the endometrial surface for the presence of hyperplasia.
4. To obtain endometrial curretings for histopathological evaluation and its correlation with the hysteroscopic findings.

REVIEW OF LITERATURE

Abnormal uterine bleeding occurs in 10-30% of the reproductive age group women [49] and is one of the most common gynaecological complaints. Abnormal uterine bleeding is the direct cause of a significant health care burden for women, their families, and society as a whole. There is no standard nomenclature or etiological classification or standardized methods of investigation for AUB among non gravid women of reproductive age group. [50] These deficiencies hamper the ability of investigators to study homogenous populations of patients experiencing AUB, and make it difficult to compare studies performed by different investigators or research groups. The investigative leverage provided by meta-analysis is undermined and, in some instances, made counterproductive because inaccurate conclusions may result. Hence a universally accepted system of nomenclature and classification has been developed by the FIGO. [50] The development of such a system is made somewhat more complex by the fact that a variety of potential causes may coexist in a given individual and because many definable entities that often contribute to, or cause AUB are frequently asymptomatic. The classification system proposed by FIGO is as follows,

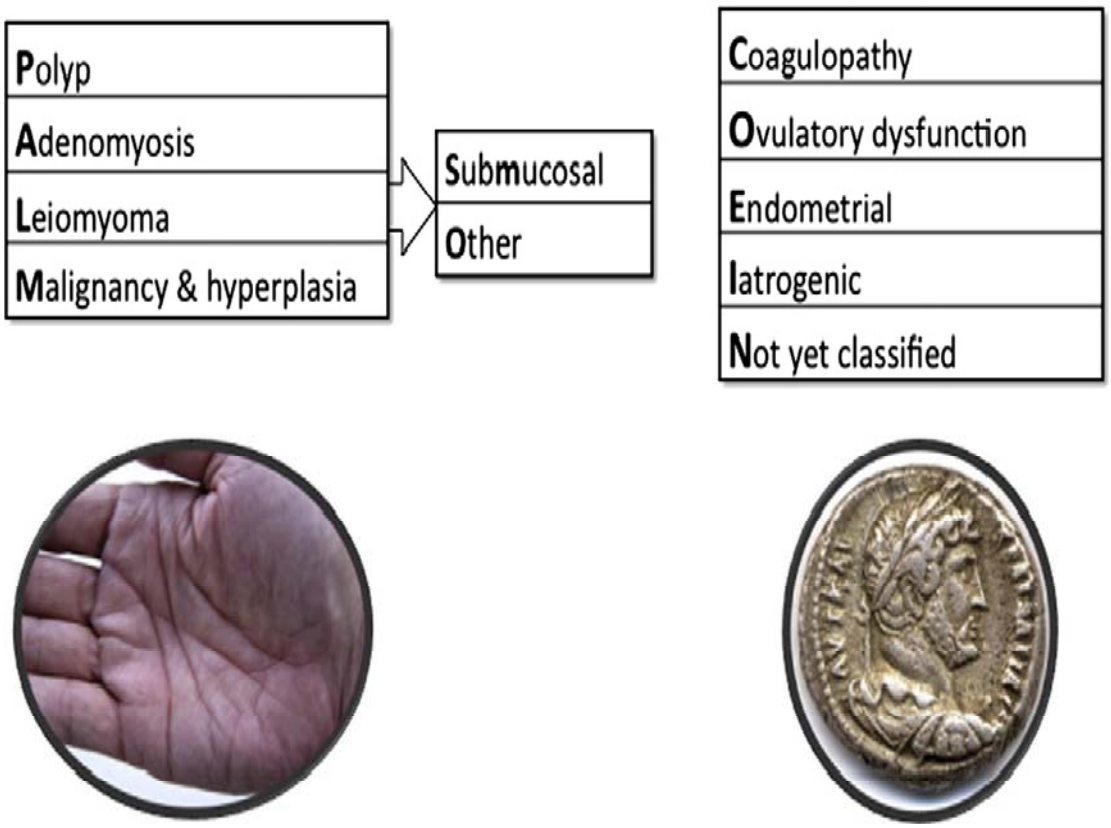

Figure.1 FIGO classification system of causes of AUB in nongravid reproductive age group women.

Although uterine bleeding is a normal physiologic episode occurrence for most women, its characteristics neverthless vary considerably. The problem is that uterine bleeding has a wide range of diagnostic possibilities and confusion is generated when review and reports fail to outline the diagnostic evaluation of the patient who presents with abnormal uterine bleeding patterns. Goals of clinical management are primarily dependent upon attaining a correct etiological diagnosis. The history, physical and pelvic examination attempt to determine the site of

the bleeding and its source. Information gathered from this will suggest what direction the investigation would take.[52]

The various causes of AUB can be broadly classified into the following three categories:

1. Organic lesions.
2. Dysfunctional uterine bleeding and
3. Systemic diseases.

ORGANIC LESIONS CAUSING AUB:

It occurs mainly due to the structural lesions or pregnancy associated causes. Structural causes are further divided into focal and diffuse. Focal causes include fibroid, endometrial polyp, adenomyosis. The diffuse lesions are atrophic endometrium, endometrial hyperplasia, endometrial carcinoma and diffuse adenomyosis. 20%-40% of patients with AUB are diagnosed to have fibroid uterus. [53]

Table.1 Structural causes of AUB

Focal lesions of endometrium	Polyp, leiomyoma, focal adenomyoma
Diffuse lesions of endometrium	Endometrial hyperplasia, endometrial carcinoma, diffuse adenomyosis
Mechanical causes	Intrauterine contraceptive devices
Infections	Endometritis, PID, tuberculosis
Vascular	Arterio-venous malformations
Partial outflow obstruction	Asherman's syndrome

Dysfunctional uterine bleeding:

It includes ovulatory and anovulatory DUB. Commonest is anovulatory and it occurs in extremes of reproductive age group. It is due to immaturity of the hypo-thalamo pituitary axis in puberty and due to insensitive ovarian follicles in the perimenopausal women.

Dysfunctional uterine bleeding was considered a diagnosis of exclusion after eliminating the causes of AUB. [51] But in women of

reproductive age group it has been classified by FIGO as AUB-N (not yet classified)

Table.2 Causes of AUB in Reproductive age group women [49]

Pregnancy associated causes
Anovulatory causes
Coagulation disorders
Fibroid uterus-submucuos, intramural
Endometrial polyps
Endometrial hyperplasia, endometrial carcinoma
Infectious causes and medication related
Complications of intra uterine contraceptive device.

Endometrial carcinoma:

The incidence of endometrial carcinoma increases with age. The incidence is 2.3 per 1, 00,000 between 30-39 years and it increases to 36.2 per 1, 00,000 between 40-49 years. [54]

Table.3 Causes of AUB in perimenopausal women[49]

Anovulation associated	Hypo-thalamo pituitary dysfunction
Focal uterine lesions	Fibroids, polyps, adenomyosis
Diffuse uterine lesions	Diffuse adenomyosis, endometrial hyperplasia and carcinoma

Endometrial hyperplasia:

Physiological or pathological alterations of the endometrial glands and stroma produced by hyperestrogenic state or carcinoma endometrium or hormonal therapy. The risk of hyperplasia progressing to carcinoma depends on the various grades of cytological atypia. It is also influenced by age, obesity, underlying ovarian disease, endocrinopathy and exogenous hormone exposure. [57,58] Endometrial hyperplasia may produce obvious space occupying lesions in which diagnosis is easy with hysteroscopy, but it may not be very obvious especially in early stages of the disease. Exact pathology is diagnosed by histopathological examination.

Table.4 Classification of endometrial hyperplasia [59]

Type of hyperplasia	Progression to cancer(%)
Simple (cystic without atypia)	1
Complex(adenomatous without atypia)	3
Simple (cystic with atypia)	8
Complex(adenomatous with atypia)	29

Uterine polyps:

Polyps are easily missed by D&C and hysteroscopy is the most reliable method for its diagnosis. Endometrial polyps secondary to treatment with Tamoxifen for breast cancer patients is a major problem for which hysteroscopy is highly valuable. Taponeco and colleagues studied 414 patients with breast cancer. All of them underwent hysteroscopy. Out of that 334 were treated with Tamoxifen for breast cancer and 80 controls. Significant difference was found in malignant (7.8%) and atypical (9%) hyperplastic polypi between the treated and control group. So the authors concluded that hysteroscopy and biopsy should be taken in any women receiving Tamoxifen and presenting with AUB. [56]

Leiomyomas:

Leiomyomas of the uterus are the most common intrauterine masses. These are the most common intrauterine bening neoplasms. If hysterectomy specimens are studied, around 75% had histologic evidence of leiomyoma. These are found in black women than white race. Myomas are usually seen in 30-40 years of age.

Many women experiencing abnormal uterine bleeding is due to myoma, thus affecting reproductive performance. Submucous myomas are more common in causing abnormal uterine bleeding. Also these submucous myomas cause recurrent pregnancy loss, even infertility and impedes conception due to mechanical hindrance. Large myomas cause preterm labour, pressure symptoms, obstruction of labour, postpartum haemorrhage, inversion of uterus and subinvolution of uterus. It also causes secondary haemorrhage.

Atrophic Endometrium:

Postmenopausal AUB is mostly caused by atrophic endometrium. Type II endometrial carcinoma may arise in a background of atrophic endometrium and are estrogen-independent. [55]

DIAGNOSTIC PROCEDURES:

The commonly used diagnostic procedures for AUB are reviewed.

Dilatation and curettage:

Traditionally Dilatation and Curettage is the most common investigations employed in the evaluation of the causes of abnormal uterine bleeding. Dilatation and Curettage is a blind procedure and half of the endometrial cavity is missed during D&C. Perforation can occur during the procedure and if suspected the procedure should be with held and observe for any bleeding or sings of intestinal injury and infection.

Ultrasonography:

Ultrasonography clearly depicts the uterine contour and the status of the ovary, but fails to provide adequate information regarding the endometrium. Endometrial hyperplasia and carcinoma can be screened using transvaginal ultrasound (TVS). Measurement of endometrial thickness (ET) is not useful in premenopausal women for distinction between carcinoma and hyperplasia. Persistent non cyclical bleeding with ET> 11mm should arouse the suspicion of endometrial carcinoma. [60] TVS detects focal lesions causing AUB but may not be that useful for hyperplasia in premenopausal women.

Saline infusion sonography:

SIS is a method which improves the visualization of endometrial cavity during TVS. A pelvic examination is done and a bivalve speculum os placed. Cervical preparation is done with an anti-septic solution and a small catheter is introduced into the cervical os for insertion of sterile saline. Speculum is then removed and saline infused into the uterine cavity during TVS. Dueholm and colleagues compared the accuracy of SIS with TVS, hysteroscopy and MRI. They concluded that SIS had an overall sensitivity comparable to the gold standard of hysteroscopy. SIS is less invasive than hysteroscopy. [56] Compared to TVS it is more invasive and expensive and more expertise needed for the procedure.

Hysterosalpingogram:

An X-ray based contrast test to evaluate the uterine cavity and the fallopian tubes. [56] Hysterosalpingogram is one of the important investigation in the diagnosis of uterine pathology. The disadvantage of it is that cannot show the exact nature of the intrauterine lesion. [56] and cannot be used for the treatment unlike hysteroscopy. It is only a diagnostic modality. Even then HSG remains a useful investigation in evaluating the uterine and tubal pathology mainly in infertility.

Hysteroscopy:

Hysteroscopic procedures were first described by Panteleoni in 1869, but until 1970s this technique was not shown interest. In 1980s, hysteroscopy replaced the blind D&C procedure. [56] Hysteroscopy has ushered a new era in the evaluation of abnormal uterine bleeding. By direct visualization of the uterine cavity it is able to pin point the etiology in majority of the cases. It can accurately detect endometrial hyperplasia and aids in the early diagnosis of endometrial carcinoma and uterine polyps. [2] However, if office hysteroscopy is available, there may be additional value in endometrial polyps, because they could be removed in the same setting. [50] The judicious use of hysteroscopy to manage this medical entity adds a new dimension in handling this often perplexing problem. In this method, the whole uterine cavity is directly observed through hysteroscope. In case of any pathological lesion, biopsy is taken and treatment is carried out through hysteroscopy if needed (e.g. removal of submucosal myoma or endometrial polyp). This procedure has been generally accepted as the gold standard for evaluation of the uterine cavity. The most important benefit of hysteroscopy is its "see and treat" potential, which not only avoids multiple hospital visits, but also provides higher patient satisfaction. However to get the maximum benefit from this procedure, it is important to select patients properly and the

investigation should be performed by skilled personnel to obtain optimal results so that patients are managed adequately and cost effectively. General anesthesia is not necessary for diagnostic hysteroscopy, since the procedure can be performed by paracervical block or venous tranquilizers. This is why it is counted as an appropriate outpatient method, economizing patient's time and money. The patients who have contraindications for general anesthesia also benefit from this procedure.

Due to its high accuracy and patient acceptance, outpatient diagnostic hysteroscopy should become a first line investigation in patients with AUB. [1-8,17,18,19] With high sensitivity and specificity of this method in diagnosis of uterine lesions, it can be used as an ideal diagnostic tool to assess the patients with AUB.

Indications of hysteroscopy:

1. Abnormal uterine bleeding
2. Menorrhagia
3. Postmenopausal bleeding
4. Intrauterine masses-leiomyoma
5. Asherman's syndrome
6. Missed IUCD.

7. Foreign body.
8. Abnormal hysterosonogram
9. Before artificial reproductive therapy

Proliferative endometrium:

In hysterosocpic examination the early proliferative endometrium appears with comma shaped coiled arteries budding in a perpendicular direction from the basal arteries. [68] These basal arteries lies on the surface of the endometrium and are parallel to one another. [64-67] In late proliferative phase the rapidly growing endometrium attains 7-8mm and the vessels are highly convoluted and spiral like. [11] The coiled arteries are seen prominently.

Secretory endometrium:

In hysteroscopy the early secretory endometrium appears as double layered. The characteristic feature is the end arterioles of the coiled arteries surround the glandular openings in the superficial layer of the endometrium.the superficial layer is transparent and the deep layer containing the coiled arteries is seen through this transparent layer. [64] In late secretory phase the colour changes from pink to ivory. A number of changes like stromal edema, accumulation of secretions are seen. [70,71] The interglandular stroma becomes dense and the coiled arteries are no longer

visible. Glandular openings surrounded by the terminal arteries remain visible.

Intrauterine masses:

Intrauterine masses like endometrial polyps which is diagnosed by ultrasound can be confirmed by HSG or by SIS. But definitive diagnosis is made by hysteroscopy. It visualizes the polyp, its size, site of origin, and also for the trearment of the endometrial polyp. Also it evaluates the pathophysiological characteristics of the polyp and focal hyperplastic growth of the basalis layer. Incidence of polyp in general population is 2-4%. [1-7] Mainly in cases of infertility it is one of the main cause. It acts an intrauterine mass hindering the implantation and mechanical hinderance. Also these cause abnormal uterine bleeding.

Submucous myoma:

The definitive diagnosis of submucous myoma is by hysteroscopy. They are seen as white hemispherical masses and are covered by thin walled fragile vessels and endometrium. They can be sessile or pedunculated. If the tumour is less than 2 cm in size it is easy to remove through the hysteroscopic route. [41-44] And if it is a pedunculated large submucous myoma it can be resected. If bleeding is anticipated it is good to treat with GnRH analogues prior to surgery. This reduces the

blood loss during surgery by causing shrinkage of the tumour. Maximal shrinkage occurs after 3 months of therapy.

Endometrial hyperplasia:

In younger women, endometrial hyperplasia and anatomical abnormalities, such as uterine fibroids, comprises the main pathology. The recommendation regarding investigation of abnormal uterine bleeding from the Royal College of Obstetricians and Gynaecologist is that women over the age of 45, should be investigated with hysteroscopy and endometrial biopsy. Outpatient hysteroscopy is both feasible and highly acceptable in the majority of patients, giving a high detection rate for intrauterine pathology. It is more sensitive and specific than transvaginal ultrasound or blind endometrial sampling. [4] The advantages of hysteroscopy as an accurate diagnostic tool are that it allows direct visual observation and localization of the pathology and targeted biopsy. It allows correct diagnosis to be made, reduces the need for major and unnecessary surgery, and is therapeutic in most of the patients with endometrial hyperplasia.

Endometrial carcinoma:

In case of endometrial carcinoma positive hysteroscopic findings are highly predictive of cancer but must always be confirmed by directed

biopsy. [9] A negative hysteroscopic examination may miss endometrial carcinoma. Random biopsies via hysteroscope should be performed in these women. [10]

Contraindications:

Absolute contraindications for hysteroscopy are cervical carcinoma, acute pelvic infection and pregnancy. If there is pelvic inflammatory disease with an unretrievable IUD, first treat the pelvic infection with antibiotics and then do an office hysteroscopy after the infection settles. Relative contraindications include large size myomas and associated medical disorders.

Equipment:

The mechanism by which hysteroscopy works is through optical and thermal energy. Uterine cavity is a distensible space and it can be distended with a medium for visualization of the cavity. [20,21,23,30,39] The scope is introduced through the cervix and the inner aspect of the uterus, endometrial lining, cornua are all visualized.

Distension medium:

For routine outpatient hysteroscopy, the choice of distension medium between carbon dioxide (CO_2) and normal saline should be left to the discretion of the operator as neither is superior in reducing pain,

although uterine distension with normal saline appears to reduce the incidence of vasovagal episodes. [50]

Uterine distension with normal saline allows improved image quality and allows outpatient diagnostic hysteroscopy to be completed more quickly compared with carbon dioxide. Operative outpatient hysteroscopy, using bipolar electrosurgery, requires the use of normal saline to act as both the distension and conducting medium. [11]

Distension medium is classified as gaseous and fluid medium.

Carbondioxide:

It has been extensively used in distending the uterine cavity. It is inexpensive, low flow rates needed and easy to maintain. Visualization using CO_2 was good and adequate distension is produced. CO_2 is rapidly absorbed through blood stream and rapidly cleared through the lungs. Disadvantage of CO_2 is that it often leaks out around the hysteroscope. CO_2 gets mixes with blood and forms bubbles. When laproscopic insufflaters are used, they have high flow rates and have caused death due to CO_2 embolism.

Fluid distension medium:

Fliud distension medium includes high-molecular weight dextran (hyskon), electrolyte solutions and non-ionic solutions (sorbitol,

mannitol, glycine). Hyskon is rarely used for many reasons. It is in a consistency of syrup and messy to use. If not cleaned properly it results in immobilization of moving parts. Even with bleeding visualization of the uterine cavity is good. It is delivered through a 50 cc syringe and intravenous extension tubing. The amount of hyskon used is not more than 500 ml. If more than that is used it can cause pulmonary edema. Sometimes it also leads to anaphylaxis and disseminated intravascular coagulation. Overall now hyskon is not useful in hysteroscopy as a distending medium. [21,23]

Low viscosity fluids are easier to use when hysteroscopy is done as an out patient procedure. The low density fluids include ionic fluids like normal saline or lactated ringer's solution and non-ionic solution like sorbitol,mannitol, or glycine. The main advantage of electrolyte containing solutions like normal saline is their less absorption, even when large quantity is used and has little risk. But these solutions cannot be used when monopolar cautery is used. The advantage of non ionic solutions is that they can be used with monopolar cautery but if large amounts are used it can cause water intoxication if there is more absoption.

The fluid used for distension should be under measurement and accurate measurements of fluid absorption to be maintained through the

procedure. Usually diagnostic hysteroscopy is done as an out patient procedure in short duration and there is no risk of water intoxication. Therapeutic hysteroscopy is usually done in surgical centres. The endometrial cavity is usually visualized under continuous flow of distension medium. The hysteroscope has two channels. Through the inflow channel the distension medium is allowed to flow in and there is an outflow channel through which the fluid comes out. In operating hysteroscopes there is another channel through which the operating instruments can be passed through.

Lights and optics:

The hysteroscope has a proximal eyepiece and distal objective. The light source is attached to the outer metallic sheath. There are inflow and outflow channels attached to the outer sheath. Even after the advent of fibreoptic hysteroscopes the visual clarity of rigid scopes remains the maximum till now. Additionally the rigid systems are more stable for therapeutic procedures. The varities of hysteroscope are flexible, rigid, microhysteroscope.

Flexible hysteroscope:

The advantage of flexible hysteroscope [20,21,23,30,40] is that its smaller diameter which causes less discomfort. Most patients do not

require cervical dilatation or anaesthesia. The Olympus hysterofibroscope provides an ergonomic design and singlehanded control. Minor surgical procedures can be perfomed through this hysteroscope, including directed biopsy or exicisional biopsy of small polyps.

Microhysteroscope:

Imagyn medical has introduced the microspan hysteroscope system, which has an integral component of 1.6 mm sheath called microhysteroscope [23,40] with enhanced optical visualization. The diameter of the outside sheath is equal to that of the pipelle. The image fibre system and the micro optics of the scope provides resolution of around 150% when compared to similar size micro hysteroscopes. The visual resolution of this is two to three times that of the similar size hysteroscope. This can be added to a microspan sheath which has an expandable working channel and in that channel 2mm semirigid instruments can be passed for biopsy or exicision. This outer sheath also allows the flow the distension medium. There is limiting valves to control the speed of the distension medium flowing into the uterine cavity.

Rigid hysteroscope:

The rigid hysteroscopes [20,31,40] range from 3 to 5 mm as the outside diameter. It is aligned so that there is continuous flow of

distension medium. The visual resolution of these systems are more than the large resectoscopes and enables excellent visualization. Recently used 3.2 mm scopes do not require any cervical dilatation. If needed it is given with a paracervical block. The operating channels allow the passage of semirigid instruments or bipolar electrodes. These rigid hysteroscopes are more useful in therapeutic procedures due to its good resolution along with bipolar technology.

Procedure

Timing of the procedure

Diagnostic hysteroscopy is done in mid proliferative phase of the cycle, where the bleeding has stopped and the growth of endometrium is such that it does not hinder the view. When done later secretory endometrium is confused with polyps. If therapeutic procedure is performed in office setup preoperative preparation with GNRH analogues provides thinning of the endometrium, allowing excellent visualisation and perhaps more efficacious treatment.

NSAIDS:

The patient should be treated with non steroidal anti inflammatory drugs around 30-60 minutes before surgery. It can be either

taken orally or rectal suppository can be used. A mild sedation may be needed in some patients.

Patient position:

The patient is placed in the dorsal lithotomy position and a digital examination is made to ensure the uterine size and position and adenexal details. The usually used examination table or preferably an adjustable electric bed is used for examination.

Cervical preparation:

After introducing a bivalve speculum, the cervix is cleansed with povidone solution. After introducing the hysteroscope the speculum has to be removed.

Paracervical block:

The use of paracervical block is controversial. In general with smaller sized hysteroscopes, no cervical dilatation and analgesia is required. The studies done showed no significant difference in pain perception scores by the patients with and without cervical block. [17-19]

Insertion of hysteroscope:

The alignment is checked before introducing the scope. Then it is gently introduced through the vagina under visualization of bivalve

speculum and then into the external os. The speculum is removed which allows more space for the manipulation of the hysteroscope. The external os is visualized, and then the endocervical canal is visualized. Insufflations medium either liquid or CO_2 is injected, allowing visualization of the cavity, which appears as a dark spot. The location of this dark spot depends on the angle of the scope and position of the uterus. The hysteroscope is then directed towards this dark spot until the cavity is entered. The flow of medium is adjusted so that the cavity is adequately distended. Then the uterine cavity is examined systematically from the fundus, anterior and posterior walls, both tubal ostia, and the lower uterine segment. The findings should be recorded in examination sheet for permanent record keeping.

Inadequate visualization is most commonly encountered during hysteroscopy. The most common cause of is inadequate flow of distension medium. Flow is raised by either raising the level of bag or increasing the pressure in the insufflators and this will overcome the problem. If the cervical canal is narrow, it may be dilated gently before inserting the hysteroscope. Blood in the cavity obscuring the view can be overcome by increasing the flow rate of the distension medium. If blood continues to obscure, high molecular weight dextran can be used. This

medium is immisible with blood but complications are more. If CO_2 is used it can leak and can be decreased by adjusting the tenaculm.

Complications of hysteroscopy:

1. Inadequate visualization due to leakage of the distending medium or blood clot

2. Perforation of uterus:

If the hysteroscope advances easily and the cavity is still not visualized uterine perforation has to be suspected. Also when the outflowing distension medium is less than the inflowing medium suspect perforation. The procedure is stopped. These are usually in midline and require no further therapy and needs observation. If monopolar or bipolar cautery is used then rule out thermal injuries of bowel. These patients should undergo a laproscopic evaluation of the pelvis, with possible laprotomy if indicated.

3. Infection :

Usually rare after hysteroscopy. Any cervical discharge present has to be evaluated before the procedure and treated with antibiotics and to be proceeded. In patients with valvular heart disease, intravenous antibiotics are given before the procedure.

4.Bleeding:

Usually rare after hysteroscopy especially when done as a diagnostic procedure. As more and more therapeutic procedure is performed using hysteroscopy this complication is now increasing. Bleeding can occur from the cervix or the urterine cavity. The cervix should be carefully inspected for any injury and bleeding at the tenaculum holded site. Intracavitary bleeding due to resection of septum or fibroids or after ablation of endometrium may be controlled by placing a Foley's catheter with 30cc balloon inflated. It acts both as a tamponade and also as a drain. It has to be kept for about 24 hours. Antibiotics to be given for these patients.

5. Economic considerations:

After recognizing the benefits of hysteroscopy from both a diagnostic and therapeutic viewpoint, the treating physician should decide in which setting to perform the procedure. One should recognize that state of the art system is expensive as it includes light sources, video equipment and other hysteroscopic equipments. Additional cost may include if bipoloar cautery is used.

Review of Diagnostic strategies:

Zhu HL *et al*, 2010 in his study found the utility of hysteroscopy and directed biopsy in the diagnosis of endometrial carcinoma in 287 patients who were treated in Beijing University People's Hospital, Beijing. The study showed that when compared with fractional D&C, hysteroscopy and directed biopsy had diagnostic accuracy before surgery and also found out the cervical involvement more precisely in endometrial carcinoma patients, but it did not increase the positive peritoneal cytology rate or affect the prognosis of these patients.

Patil SG *et al*, 2009 in his prospective study, did diagnostic hysteroscopy in AUB cases and found that hysteroscopy provides more accurate diagnosis than dilatation and curettage.

Ricardo Bassil Lasmar et al, 2008 in his retrospective study, showed the correlation of hysteroscopy with histopathological analysis. Most frequent histologic diagnosis is normal endometrium in controls but found to be endometrial polyps in hysteroscopic findings in patients with AUB.

Bender R, Rzepka-Gorska I, 2007 in his study compared hysteroscopy directed biopsy and dilatation and currettage in perimenopausal women and found that hysteroscopy directed biopsy is

better than dilatation and curettage in disclosing all types of intrauterine lesions.

Van dongen H, 2006 in his study done a Meta analysis of diagnostic hysteroscopy in AUB and found that positive and negative likelihood ratio were 7.9% and 0.04% and overall success rate was 96.9%

L. Birinyi et al, 2004 in his study have performed hysteroscopy in 835 patients with biopsies over more than 13 years and compared the hysteroscopic findings with histological findings. They found that the sensitivity of hysteroscopy was 0.52 for hyperplasia, 0.87 for polyps, 0.85 for myomas, 0.68 for carcinoma, and 0.73 for atrophy.

Gianninoto A et al, 2003, in his study did hysteroscopy in 512 patients in the age group of 38-80 years with AUB from January 1996 to December 2001. It was observed that hysteroscopy is simple, safe, well tolerated and reliable in the diagnosis of AUB among all age groups and it can drastically reduce the need for conventional curettage, thereby increasing patient satisfaction and lowering costs.

Pasqualotto EB et al, 2000, in his study did hysteroscopy in 375 patients with AUB. It was seen that diagnostic hysteroscopy is a safe outpatient procedure and is associated with high satisfaction in carefully selected patients. He showed that hysteroscopy is a better diagnostic test

for intracavitary abnormalities of uterus than TVS and endometrial biopsy by dilatation and curettage.

The value of the diagnostic test for abnormal uterine bleeding is provided in many comparative studies between ultrasound, sonohysterography and diagnostic hysteroscopy, all these correlated with biopsy. The quality of these studies is affected by the lack of common spectrum for the patients under study. But this should be overcome by the recognition that the reference test was invasive.

All the diagnostic tests mentioned had likehood ratios similar in the non-diseased. But considerable variation was seen between transvaginal ultrasound and sonohysterography and showed that pooling of likelihood ratios was not satisfied. But this has been overcome by diagnostic hysteroscopy. This test did not have much heterogenicity.

The results found out of these studies were detection of any intrauterine pathology. Fibroids especially submucous, endometrial hyperplasia and endometrial carcinoma. Transvaginal ultrasound is more specific in diagnosing intrauterine pathology but lacks sensitivity. Specificity is 95% but sensitivity is only 60 to 77%. For submucous myomas it has a sensitivity of 80% and specificity of 69%. Many intramural myomas are diagnosed as submucous by TVS.

Transvaginal ultrasound has a high false negative rate in diagnosing intrauterine pathology when compared to diagnostic hysteroscopy. SIS and hysteroscopy are equally accurate in diagnosing submucous myomas and the likelihood ratios of both lies in a good range suggesting that both are equally good tests. Both hysteroscopy and SIS are accurate in diagnosing endometrial hyperplasia.

Considering various studies, combination of TVS followed by SHG is better than TVS alone for intrauterine abnormalities. But no studies combined both these two tests. Also reviewing the studies showed that transvaginal ultrasound is more sensitive in diagnosing endometrial hyperplasia in women of reproductive age group if the endometrial thickness is more than or equal to 12mm.

It was Siegler in 1976 who published an article which included 257 patients. All of them underwent hysteroscopy as a diagnostic test for abnormal uterine bleeding under general anaesthesia. After this study, hysteroscopy has become one of the first line tests in diagnosing endometrial pathology. It can be done as an office procedure with minimal analgesia.

It is one of the continual modifications of endoscope which is used for imaging human inner cavities. Main disadvantage of hysteroscopy is its invasiveness and discomfort. Remarkable changes

have been made in the field of hysteroscope since its invention. Many advances in this technique have decreased the caliber of the hysteroscope which decreases the discomfort and pain associated with this procedure. Some authors have said that the accuracy of diagnosis based on hysteroscopic visualization is high for endometrial cancer and moderate for other endometrial diseases. Since Hysteroscopy and its directed biopsy is more accurate than dilatation and curettage, it is considered an accurate 'gold standard' in uterine cavity evaluation. [7]

Hysteroscopy is better and useful diagnostic tool for assessing intracavitary abnormalities. [5] It is safe with less significant complications and it allows for the visualization of the probable uterine source of bleeding in the presence of organic lesions and also provides a means to sample the site most likely to yield positive results[(4)]. Hence Hysteroscopic evaluation in patients with abnormal uterine bleeding is needed.

There was considerable relation seen in association with the age of the patient and the histopathological findings. [25] It was observed that submucous myomas were commonly seen in pre-menopausal women, whereas endometrial polyp is seen with increasing age. Inspite of the fact that SHG did not revealed any endometrial pathology in many young patients with AUB, it was detected by hysteroscope. This was especially

significant in female patients with infertility, where hysteroscopy is one of the important investigations for infertility. [23,24,27]

Many endometrial lesions that caused infertility included endometrial polyps, endometrial hyperplasia, intrauterine adhesions, and especially submucous myomas. [15,17,19] Many of these lesions caused abnormal uterine bleeding along with infertility. Hysteroscopy is very much useful in diagnosis of these lesions, especially endometrial polyp and endometrial hyperplasia, were hysteroscope is both diagnostic and therapeutic. Endometrial polyp can be removed under vision and hyperplastic endometrium can be ablated. Endometrial ablation can be done under hysteroscopic guidance under vision. Hysteroscopy is also useful in evaluation of postmenopausal bleeding. Biopsy can be taken under hysteroscopic guidance if any suspisicious lesion is found and is more sensitive. A study by Gimpelson and Rappold was done to quantitate the lack of diagnostic precision of dilation and curettage in finding out intrauterine pathology when compared to hysteroscope in patients with abnormal uterine bleeding. [22] The hysterocopic correlation with intrauterine pathologic findings was statistically significant ($p<0.001$)

The sensitivity of dilatation and curettage versus hysteroscopic biopsy in endometrial hyperplasia was 65% and 98% respectively

(Loeffer). Endometrial hyperplasia was suggested with office hysteroscopy in 21.2% of patients enrolled in a study. In these 50 patients histological examination confirmed the diagnosis of endometrial hyperplasia, with a 71.4% positive predictive value (PPV) of the technique. In 33 cases focal lesions was seen. [41] In 37 cases hysteroscopy suggested a diffuse hyperplasia and the PPV in this is 71.6%. Overall hysteroscopy proved a sensitivity of 80.6% and a specificity of 92.5% compared to histology, in the diagnosis of endometrial hyperplasia. [42,43] Hysteroscopy along with other modalities like HSG and USG augments the final diagnosis but does not replace HSG. The advantage in hysteroscopy is its direct visualization of the intrauterine cavity, which the other investigations do not have. Also the disadvantage of hysteroscopy is that it is not useful in pathology of myometrium and subserous myoma which is also associated with abnormal uterine bleeding.

The previously used 5mm hysteroscopes caused much discomfort and pain which needed anaesthesia and the procedure done in operative theatre settings. Recently used 3.2 mm scopes cause minimum discomfort and reduced the need of analgesia. There was no need for cervical dilatation when 3.2mm scope was used. Cervical dilatation depends also on the parity, and easily passed in multiparous women. For

these patients intracervical or paracervical anaesthesia was effective. A study by Kremer et al showed that 93.3% of patients tolerated hysteroscopy well. Only 5.4% patients experienced moderate to severe pain. In patients where hysteroscopy failure seen had difficulty in insertion in 47% and poor visibility in 42%. An alternative for this is flexible hysteroscopy. But the disadvantage of flexible hysteroscope is a little poor quality of visualization when compared to rigid hysteroscope. Advantage of flexible hysteroscope is that it causes less discomfort and no need of anaesthesia.

The main purpose of this study was to determine the diagnostic value of hysteroscopy in evaluating the uterine cavity in order to improve the accuracy in investigating patients with abnormal uterine bleeding. By reviewing the above studies it is clear that diagnostic hysteroscopy should be considered the firstline investigation for evaluation of AUB. The disadvantage of in the diagnosis of myometrial and adenexal lesions can be overcome by subjecting the patients to ultrasound before the procedure and followed by hysteroscopy.

MATERIALS AND METHODS

This is a prospective study in the role of diagnostic hysteroscopy in evaluation of AUB in reproductive age group women and its histopathological correlation. This study has been conducted in the Department of Obstetrics and Gynaecology, Coimbatore Medical College Hospital. The duration of the study was from December 2012 to November 2013. Clinical assessment and thorough local and systemic examination of 50 patients of reproductive age group was done and relevant findings were recorded with informed consent.

Pre operative investigations:

- Haemoglobin
- Platelet count
- White cell count
- Blood sugar
- Blood urea
- Serum creatinine
- Blood grouping
- Rh typing
- HIV

- VIA/VILI/ Colposcopy
- ECG
- Chest X-ray
- Ultrasound abdomen

Aneasthetic fitness was obtained.

Injection TT ½ cc given intramuscularly.

Prophylactic antibiotics with second generation cephalosporins was given in pre operative and post operative period.

STANDARD INDICATIONS:

In this study hysteroscopy was done to evaluate abnormal uterine bleeding in reproductive age group women. And also patients with infertility and AUB, suspected fibroid with bleeding are included in the study.

Premenopausal women with

- Menorrhagia
- Metrorrhagia
- Polymenorrhea.

EXCLUSION CRITERIA:

1. Puberty menorrhagia
2. Severe anaemia
3. Pelvic infection
4. Surgical and medical complications like uncontrolled diabetes, severe hypertension and bronchial asthma.
5. Cervical carcinoma.

HYSTEROSCOPIC PROCEDURE:

Hysteroscopy was done in the proliferative phase of the cycle.The procedure was done with aministration of short intravenous anaesthesia. In a few cases paracervial block was used. Patient's bladder was emptied before the procedure. Patient was put in dorsal lithotomy position and perineum and vagina are gently swabbed with povidone iodine. Bimanual examination of pelvis was done. Sim's bivalve speculum introduced into the vagina gently and the posterior vaginal wall retracted backwards. The anterior lip of cervix comes to view and is holded with the valsellam. The hysteroscope is checked before

introducing for the eye-piece, objective lens, clarity and then introduced through the vagina, ectocervix and the endocervical canal. Any lesion found noted. The speculum removed. None of the patient needed cervical os dilation during the procedure. 400 micrograms of misoprostol tablet was kept vaginally 6 hours before the procedure.

The hysteroscope used was a 30 degree hysteroscope of diameter 4.3 mm outer sheath. Illumination of the scope was provided by a high intensity cold light source via a fibre optic cable and the procedure monitored through the video monitor.

Then the hysteroscope was introduced into the uterine cavity. Normal saline was used as the distension medium. The uterine cavity is allowed to get distended. Flow rates of the normal saline were around 70 ml/min. The uterine cavity was examined in a systematic manner. The hysteroscope was guided through the endocervical canal into the uterine cavity under vision. The ostia of the tubes examined. Then the endometrial surface was examined. All the surfaces of uterine cavity, that is the anterior wall, posterior wall, and lateral walls were examined. The appearance of the endometrium, colour, any polyps, fibroid, hyperplasia and vascularity noted. During withdrawing the hysteroscope cervical canal visualized.

Endometrial sampling was done and sent for histopathological examination. The examination was considered complete when all the parts were visualized. If any difficulty in visualization due to blood clot occurs then the procedure is considered as incomplete and failed. The hysteroscopic findings correlated with the histopathology results.

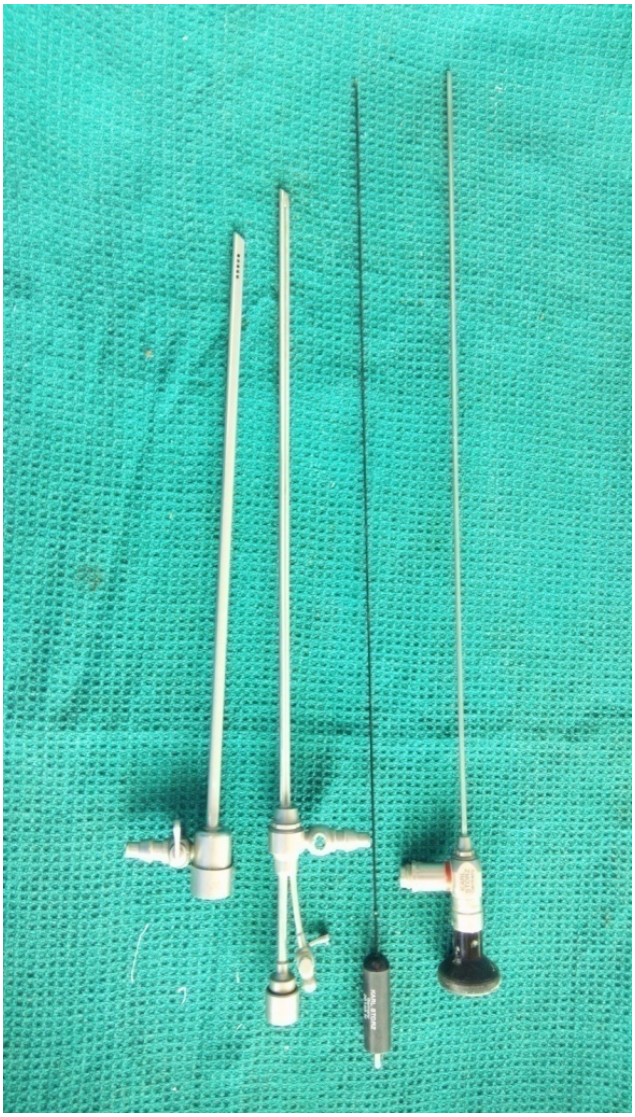

Figure.1 showing the hysteroscope

RESULTS AND OBSERVATION

50 patients of reproductive age group with AUB were selected for the study. The duration of prospective study was between December 2012 and November 2013. All the patients with AUB were subjected to hysteroscopy and biopsy and histopathological confirmation obtained for all. All the patients were of low socio economic status. Hysteroscopy was done under intravenous sedation. It was successful in 100% of cases and concluded satisfactory in almost all cases. There was no failure in any of the patients taken for study. During and after the procedure there was no complication. Menorrhagia was the most common complaint in our study which was seen in 42 patients(84 %) of reproductive age group women. 6 patients(12%) presented with polymenorrhoea. 2 patients(4%) presented with intermenstrual bleeding.

Table.5 showing complaints of patients in our study

Symptom	No. of patients
Menorrhagia	42(84%)
Polymenorrhoea	6(12%)
Intermenstrual bleeding	2(4%)

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44 out of 50 patients (88%) in the study group are multiparous and 8 patients (16%) were nulliparous. There was no difficulty in insertion of hysteroscope in any of the nulliparous patients.

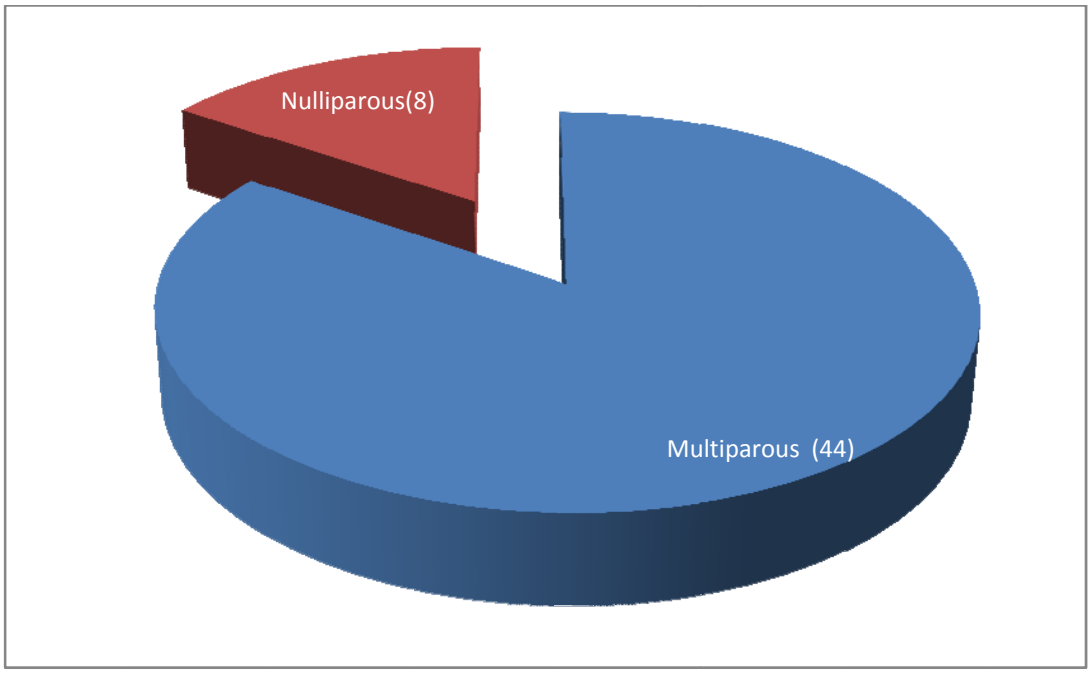

Figure.3 showing the distribution of Gravidous women in our study

Table.6 showing distribution of gravidous women in our study.

No. of patients	**Parity status**
Multiparous	44(88%)
Nulliparous	6(12%)

There was no difficulty in insertion of the hysteroscope in nulliparous women. No cervical dilatation was done even in nulliparous

women. 400 micrograms of tablet misoprostol was kept vaginally in all patients before the procedure.

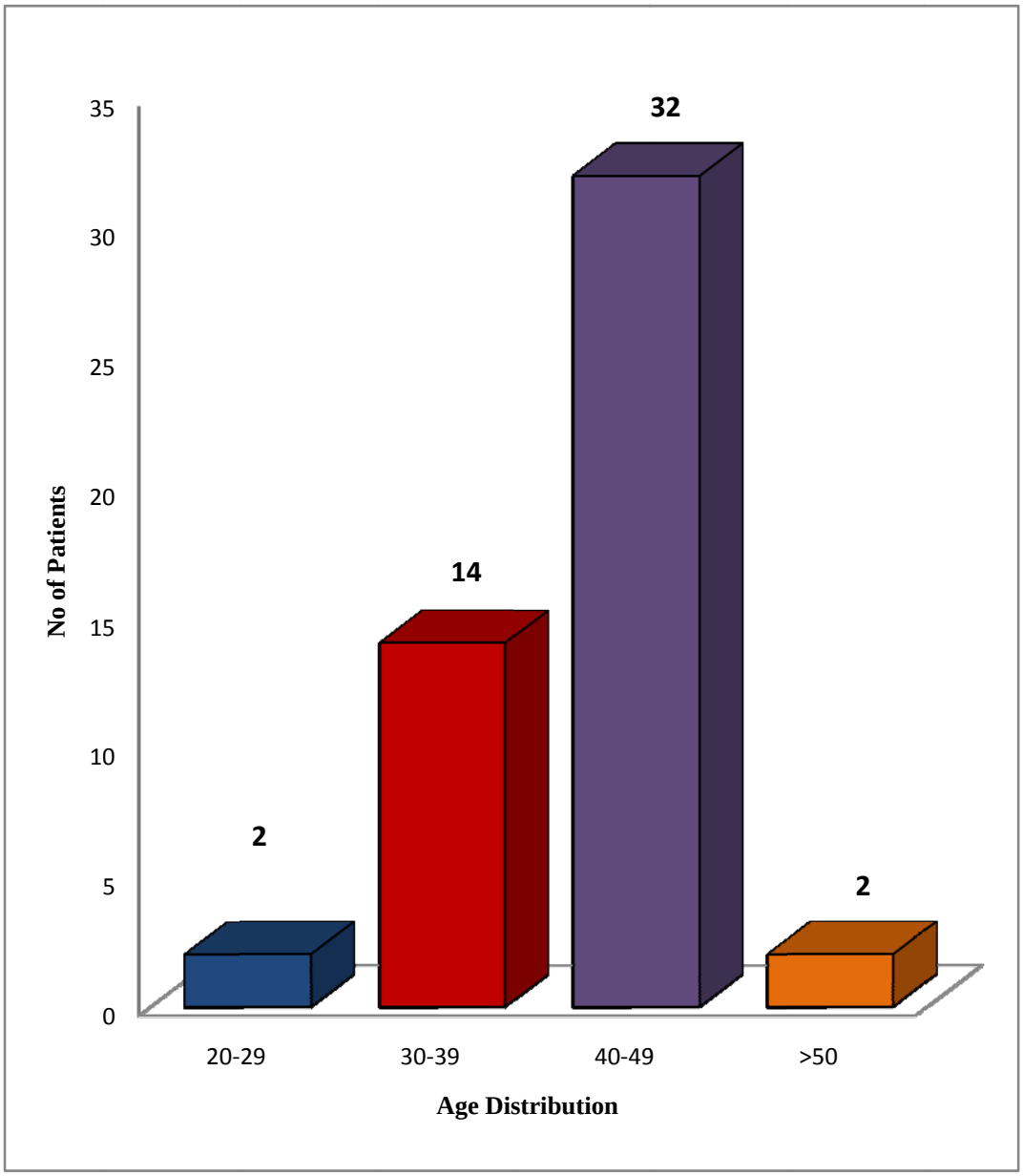

Figure.4 showing age distribution of patients with abnormal uterine bleeding.

40-49 years age group had the maximum number of patients in our study.

Table 7 –Age distribution of patients with abnormal uterine bleeding

Category	20-29	30-39	40-49	>50	Total
Menorrhagia	4	20	16	2	42 (84%)
Intermenstrual bleeding	1	1	0	0	2 (4%)
Polymenorrhoea	0	2	4	0	6 (12%)

Menorrhagia was found in 4 patients (8%) in 20 – 22 years age group. 20 patients (40%) were in 30 -39 years age group. 16 patients (32%) were in 42 - 49 years age group. 2 patients (4%) were greater than 50 yaers.

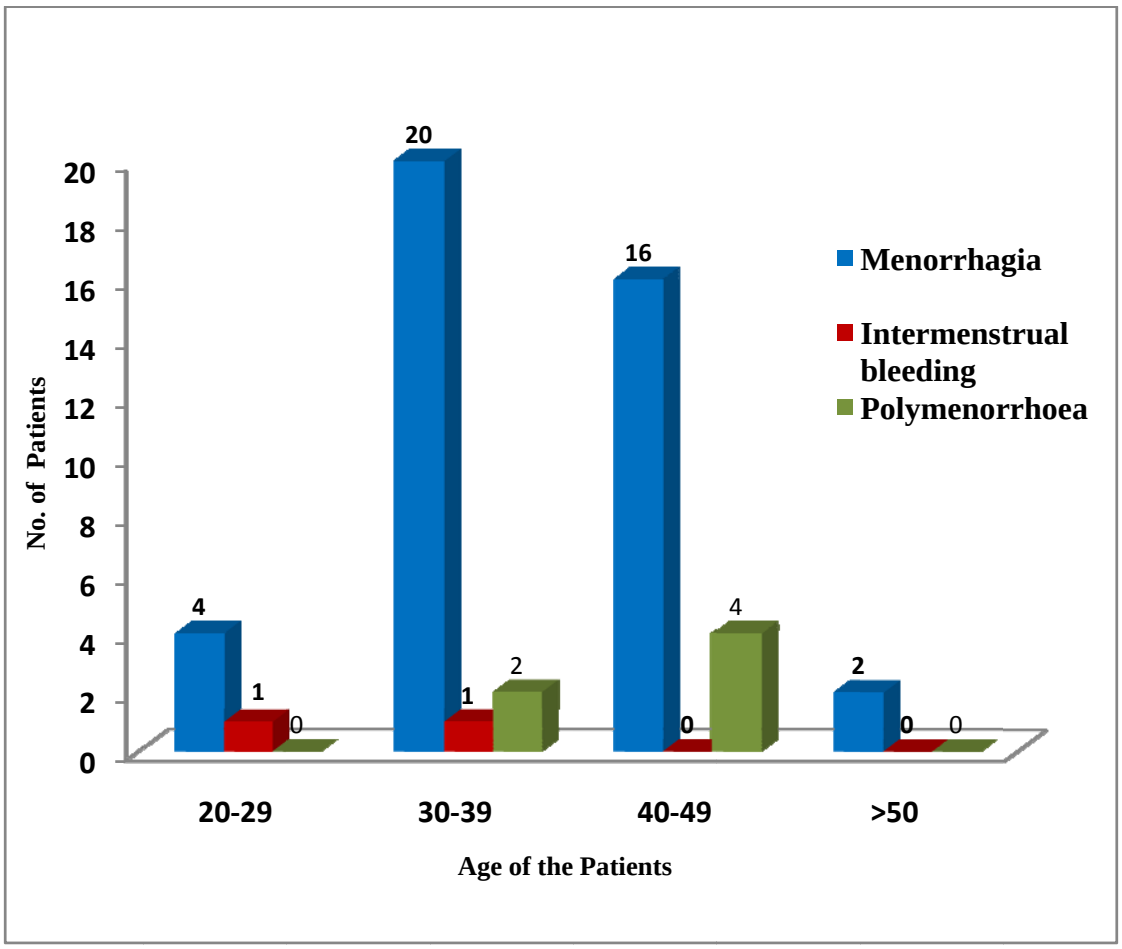

Figure.5 showing age distribution with regard to complaints.

In intermenstrual bleeding group 1 patient (2%) was in 20 – 29 years age group and the other in 32 – 39 years age group. 2 patients (4%) of polymenorrhoea were in 30 - 39 years age group and 4 patients (8%)

Table 8 – showing duration of patient's symptoms

Duration	No. of Patients
< 6 months	16
6 – 12 months	15
> 12 months	19

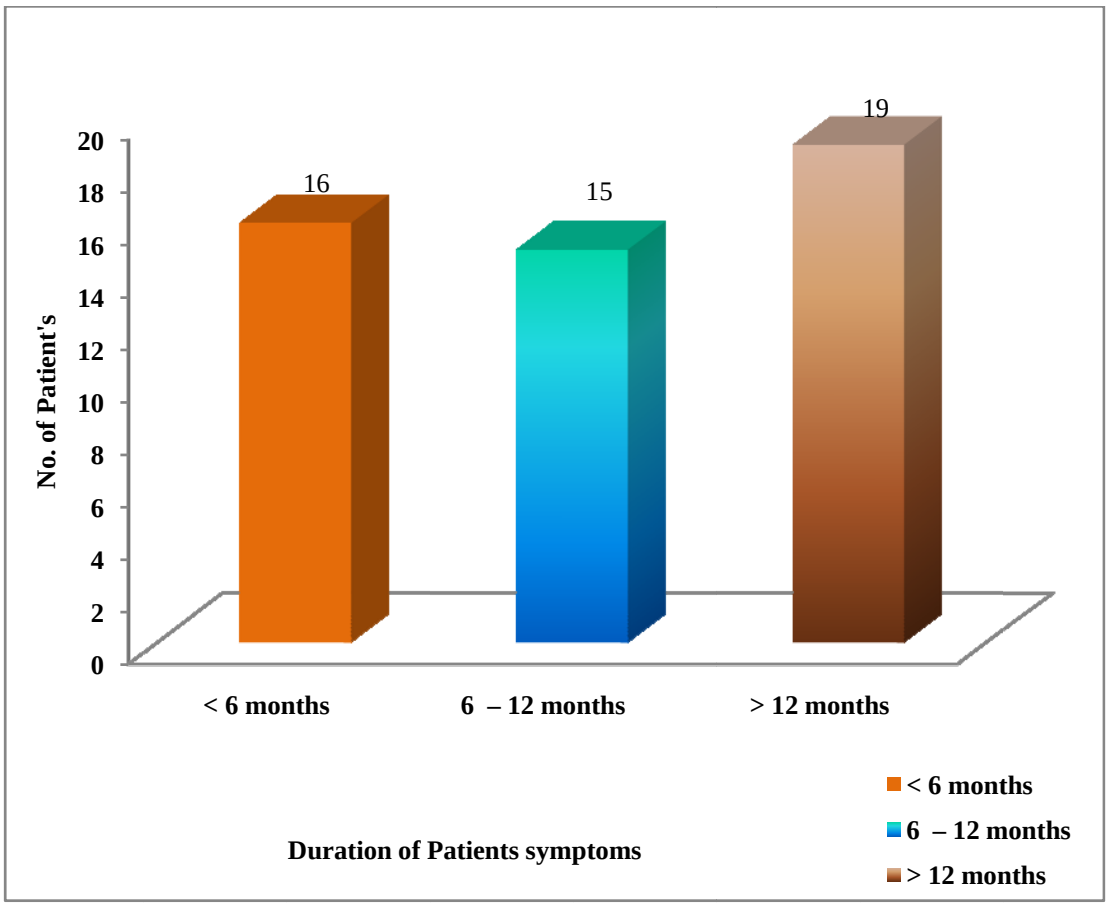

Figure.6 showing duration of patients symptoms.

Table .9 showing hysteroscopic findings.

Parity	**nulliparous**		**Multiparous**	
Finding	No.	%	No.	%
Proliferative endometrium	4	8	14	28
Secretory endometrium	0	0	8	16
Atrophic endometrium	0	0	4	8
Myoma	1	2	9	18
Hyperplastic endometrium	1	2	9	18
Carcinoma endometrium	0	0	0	0

6 (12%) of the patients in the study included are nulliparous. Even in those patients no cervical dilatation was required while doing hysteroscopy. In those 6 patients, 1 patient (2%) had submucosal myoma. 4(8%) patients had proliferative endometrium. Endometrial hyperplasia was found in 1 patient (2%) of the 6 patients.

In multiparous patients 14 patients (28%) had proliferative endometrium. 8(16%) patients had secretory endometrium. Endometrial hyperplasia was found in 9 patients (18%) of multiparous women. 9(18%) patients had myoma uterus in multiparous group. 4(8%) patients had atrophic endometrium among multiparous women.

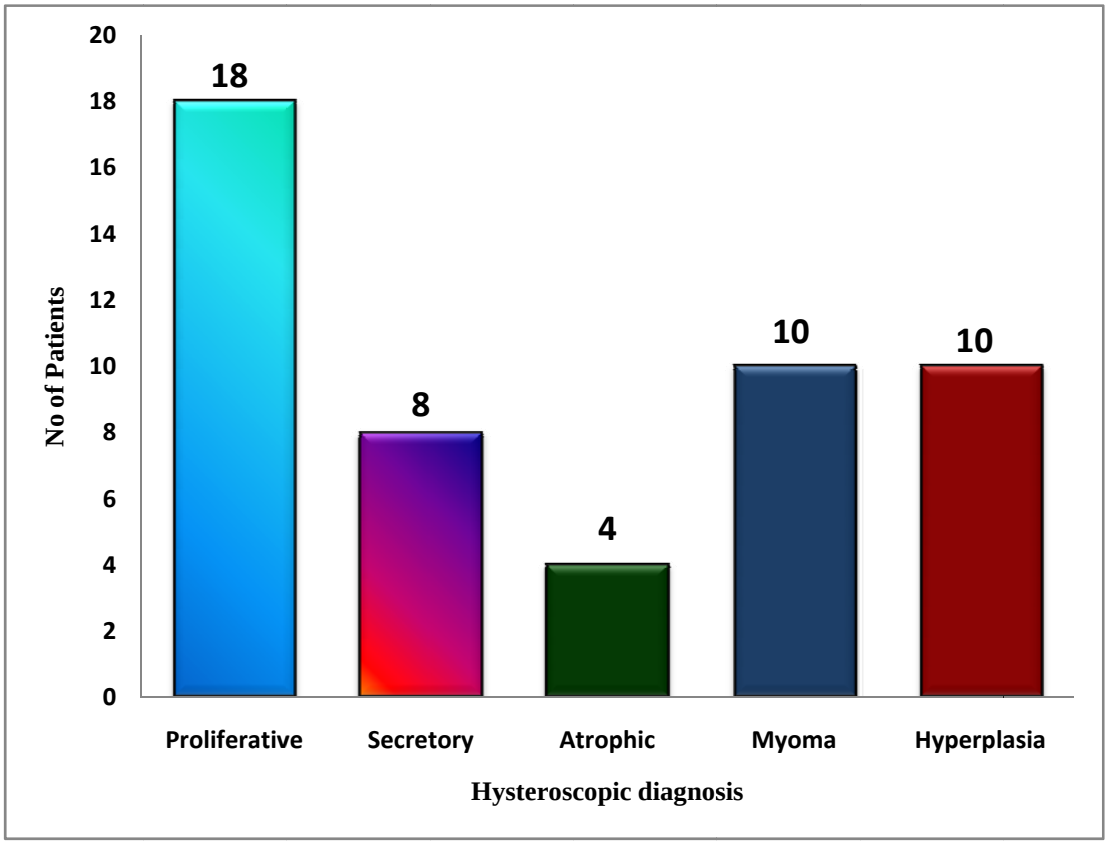

Figure.7 showing hysteroscopic diagnosis in 50 patients.

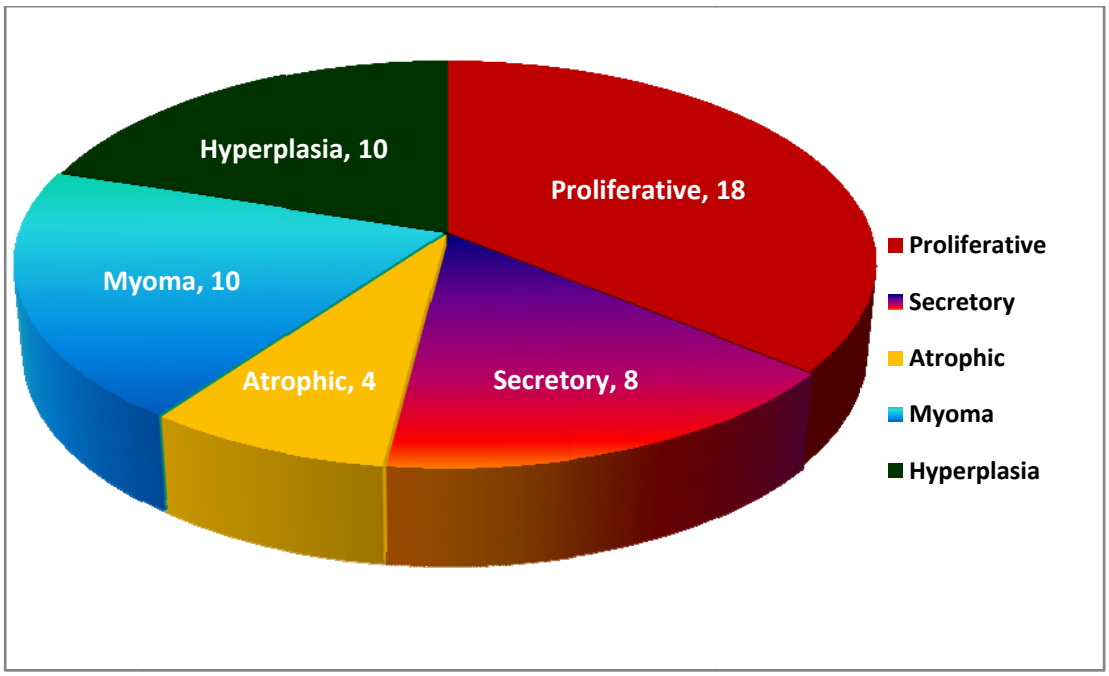

Figure.8 showing hysteroscopic findings in our patients

Diagnostic hysteroscopy was performed in 100% of patients with success under intravenous sedation in 46 patients (92%). In 4 patients (8%) paracervical block was used.

Myoma was seen in 10 patients (20%) in hysteroscopy. Proliferative type of endometrium was seen in 18 patients (36%). Secretory endometrium was seen in 8 patients (16%). Atrophic endometrium was seen in 4 patients (8%). Hyperplastic endometrium was observed in 10 patients (20%).

Hysteroscopic appearance of proliferative endometrium is the comma shaped coiled arteries growing in a perpendicular fashion to the basal arteries. These basal arteries lie in the surface of the endometrium

parallel to one another. The coiled arteries prominently appear in the late proliferative endometrium.

Hysteroscopic appearance of secretory endometrium is that the glandular openings are surrounded by the terminal arterioles. The coiled arteries are not visible due to the dense interglandular stroma. The density is due to stromal edema and accumulation of secretions. The colour changes from pink to ivory.

Hysteroscopic diagnosis of endometrial hyperplasia was based on one or more of the following features:

1. Increase in the endometrial thickness- focal or diffuse.
2. The endometrial surface appears irregular.
3. Appearance of cystic spaces protruding into the endometrium.
4. Increased vascularity and dilated superficial vessels on the panoramic view.

Endometrial hyperplasia may produce obvious intracavitary lesions which appears as white, friable with little or no vessels in hysteroscopy. The panoramic view of the endometrial cavity is distorted by these lesions. Sometimes endometrial hyperplasia may exist in spite of little or no obvious endometrial lesions in hysteroscopy.

The hysteroscopic appearance of low risk endometrial hyperplasia includes an increase in the thickness of the endometrium, its dyshomogeneous regeneration, increased vascularization and the presence of ciliated images, cystic dilatation, increased bleeding, polypoid formation, necrotic zones and the concentration and irregular arrangement of the glandular openings.

Leiomyoma:

Benign leiomyoma was seen as a mass lesion buldging into the endometrium in hysteroscopy. It appears as white spherical masses covered with a network of fragile thin-walled vessels when viewed by hysteroscope. It can be sessile or pedunculated.

Endometrial carcinoma:

In its initial stages, endometrial cancer shows a papillary appearance with irregular polylobate excrescences which are friable and partly necrotic or haemorrhagic. Vascularization is irregular and increased. Often there is a clear dividing line between cancerous and normal endometrium.

The procedure was completed after obtaining complete hemostasis and directed biopsies are taken from lesions that gave the

impression of focal hyperplasia or from uterine walls in case of diffuse hyperplasia.

Hysteroscopy guided biopsy was taken in all patients included in the study. No serious complications were encountered during the procedure. The complications usually expected are uterine perforation and bleeding. The sensitivity of hysteroscopy was assessed by correlating the findings of hysteroscopy with the histopathological examination of the tissues obtained. The hysteroscopic findings in the study are:

Table.10 showing histopathology findings in our patients.

Hysteroscopy		**Histopathology findings**				
Hysteroscopy	**No.of patient**	**proliferative**	**secretory**	**atrophic**	**hyper plasia**	**Submucous**
Proliferative	18	19				
Secretory	8		9			
Atrophic	4			4		
Hyperplasia	10				8	
Myoma	10					10

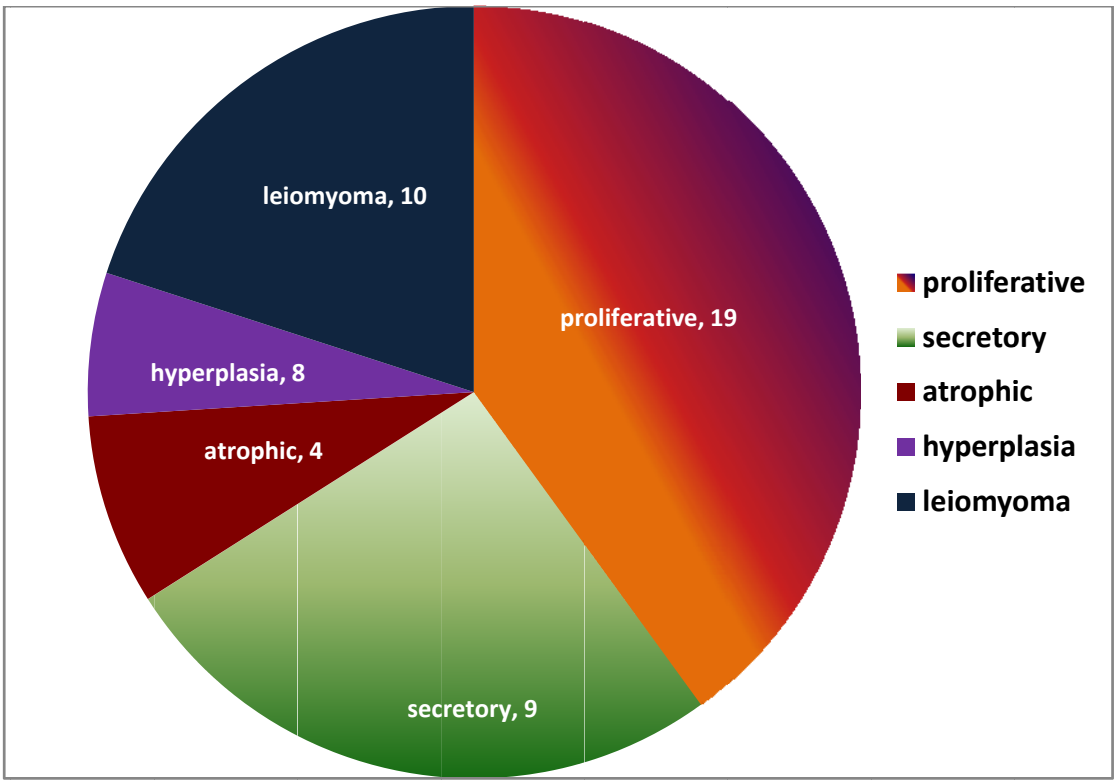

Figure.9 showing histopathological findings in our patients.

1. In histopathology the features found in proliferative endometrium are tubular glands with columnar cells and surrounding dense stroma. It is due to the estrogenic action on the endometrium corresponding to the follicular phase of the ovarian cycle. Arteriolar vessels grow up into the endometrium.

2. The characteristics of secretory endometrium are prominent subnuclear vacuoles in cells which forms the glands consistent with post ovulatory day corresponding with luteal phase in the ovarian cycle. Coiling of spiral arterioles is seen. The stroma contains abundant eosinophilic cytoplasm and is dense.

3. Endometrial hyperplasia:

a. Simple hyperplasia:

Crowded and often cystically dilated glands with some outpouching and budding. Glands lined by pseudo stratified nuclei that show minimal atypia.

b. Complex hyperplasia (adenomatous hyperplasia):

Characterized by more definitive architectural atypia. Endometrial glands gives an irregular definition and increasing architectural complexity at lower pole. Endometrium appears more complex.

In our study out of 8patients showing hyperplasia in HPE, 6 patients (12%) had simple hyperplasia. 2 patients (4%) had complex hyperplasia. Both of them underwent hysterectomy and confirmed the diagnosis.

Table.11 showing hyperplasia in HPE

Total no. of patients with hyperplasia in HPE	**8(16%)**
Simple hyperplasia	6(12%)
Complex hyperplasia	2(4%)

4. Benign leiomyoma :

In histopathology it was seen as bundles of smooth muscle interlacing with eosinophilic cytoplasm. Smooth muscle cells are tightly packed when compared to the normal myometrium and these tumours appear more cellular compared to the normal myometrium with whorled appearance.

Table.12 showing Sensitivity, specificity, predictive value and negative predictive value of Hysteroscopy with HPE

Variable	**Sensitivity%**	**Specificity%**	**PPV%**	**NPV%**
Proliferative	94.73	100	100	96.87
Secretory	88.88	100	100	97.61
Atrophic	100	100	100	100
Myoma	100	100	100	100
Hyperplastic	100	95.23	80	100

The sensitivity of hysteroscopy in detecting myoma and hyperplasia was 100%. For hyperplasia the positive predictive value was 80%. For atrophic endometrium it hysteroscope was 100% sensitive and specific. For proliferative endometrium sensitivity was 94.73% and sensitivity for secretory endometrium was 88.88%.

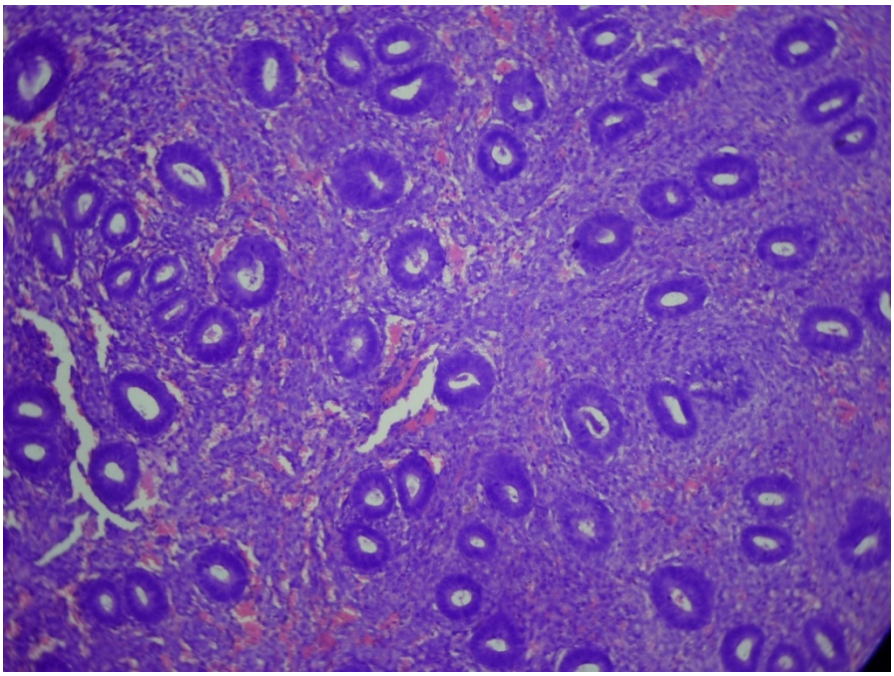

Figure.11a. Proliferative Endometrium

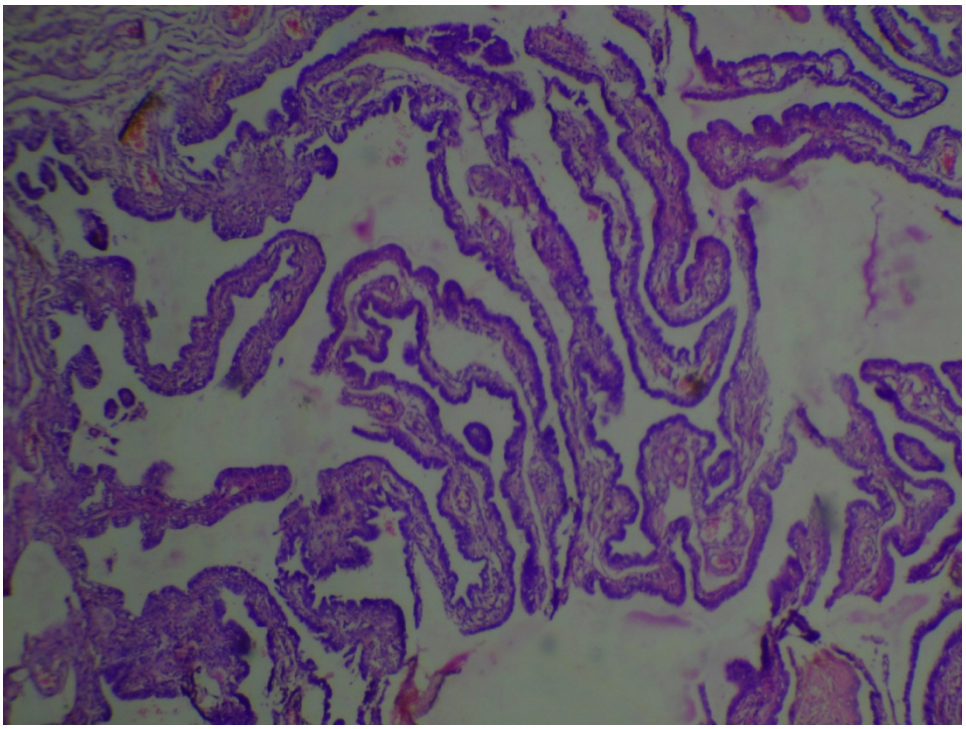

Figure.11b Secretory Endometrium

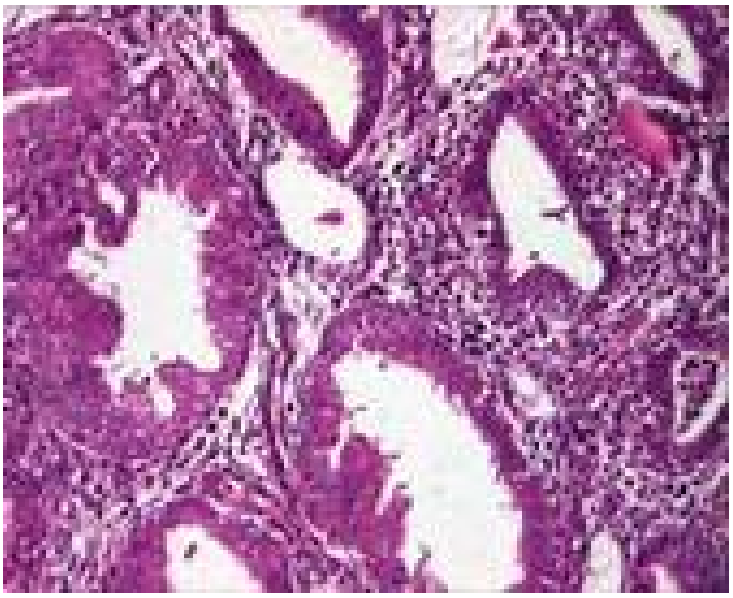

Figure.12a. Simple Hyperplasia

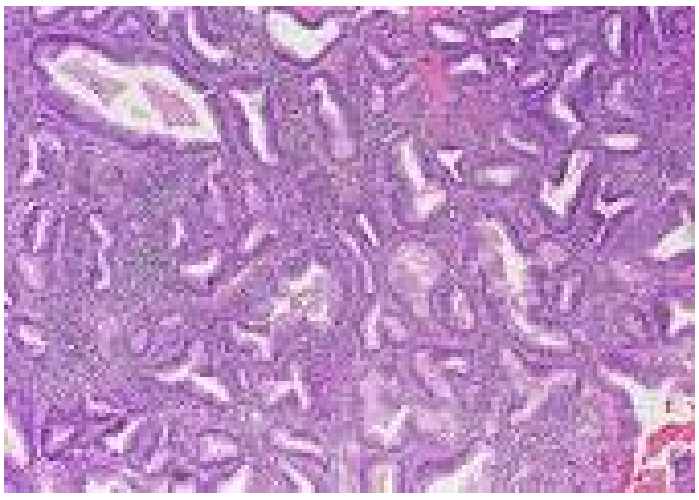

Figure.12b. Complex Hyperplasia

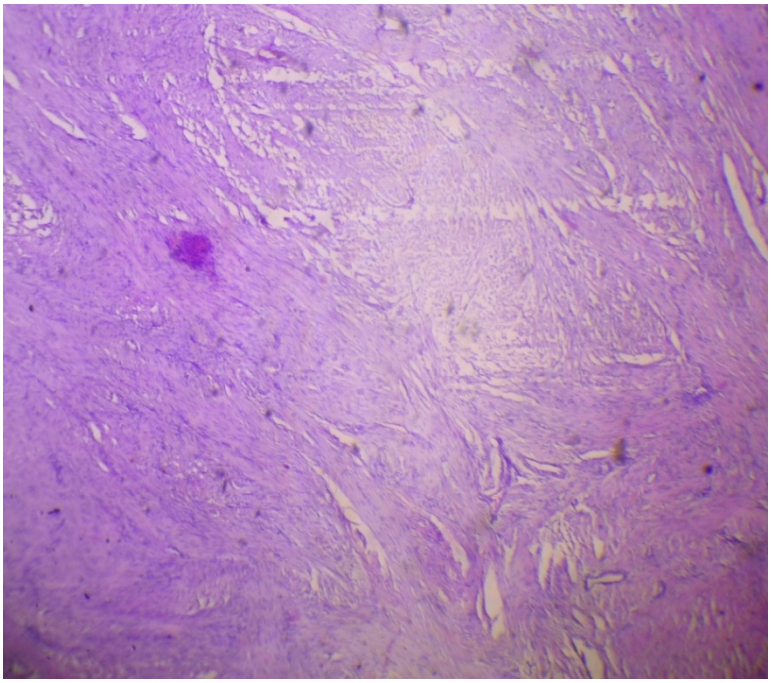

Figure.13a. Leiomyoma Uterus

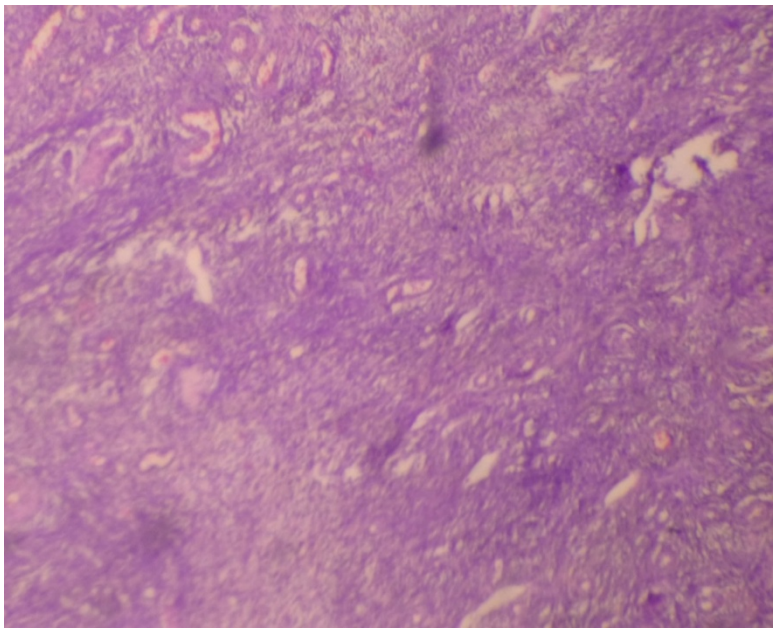

Figure.13b. Atrophic Endometrium

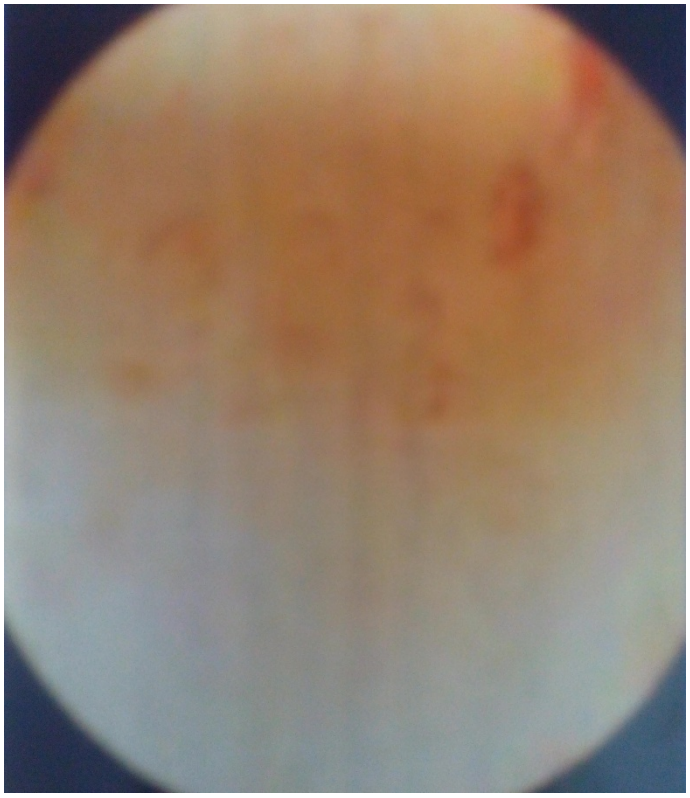

Figure.10a. Proliferative Endometrium In Hysteroscopy

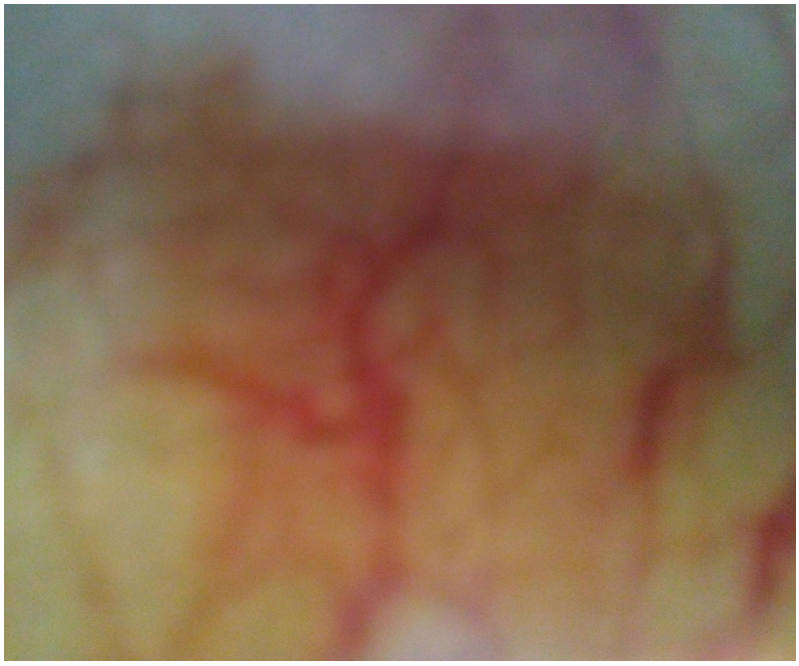

Figure.10b. Secretory Endometrium in Hysteroscopy

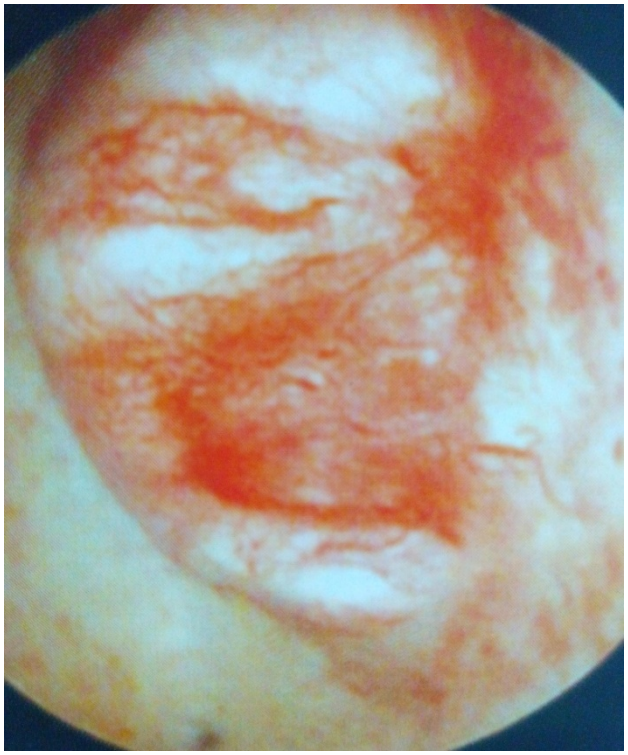

Figure.10c. Submucous Myoma in Hysteroscopy

Figure. 10d. Atrophic Endometrium in Hysteroscopy

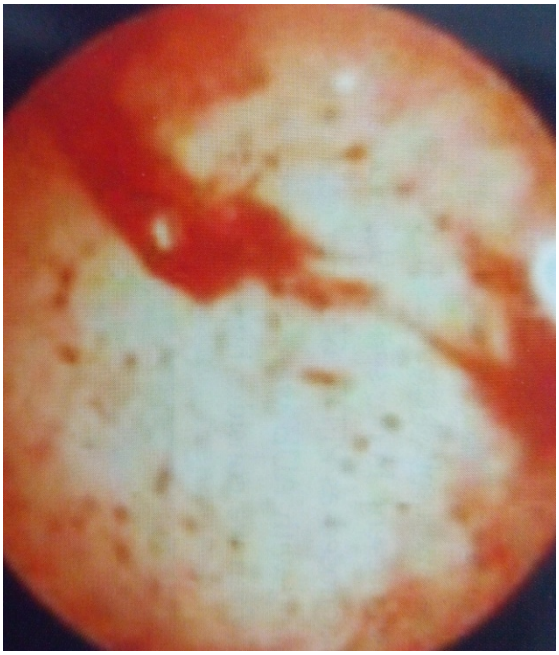

Figure.10e. Hyperplastic Endometrium in Hysteroscopy.

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DISCUSSION

Abnormal uterine bleeding (AUB) represents a notable sign for bening and malignant uterine pathology. AUB was the only indication for 48% of 10,020 hysteroscopic examinations preformed according to reports in the literature. [1] Abnormal uterine bleeding during any age group is of concern and has to be evaluated. Menorrhagia was the most common complaint of the patients included in the study, 40 patients (80%), which was seen in 4 (8%) of patients in 20-29 years age group, 20 patients (40%) in the age group of 30-39years and 16 patients (32%) of patients in the age group of 40-49 years. Others had complaints like polymenorrhoea (6 patients) and intermenstrual bleeding (2 patients).

Sharp curettage, dilatation and curettage [22] or various other intrauterine sampling devices like Pipelle canulla was considered to be the most commonly used methods of diagnosis of abnormal uterine bleeding before the use of hysteroscope. [26,28,35,39] The success rate of these procedures has been viewed in two ways: first is in most of the studies, the success rate of the specific method is determined by its ability to diagnose endometrial carcinoma. Second is there is no comparative studies between endometrial sampling of these studies with hysteroscopic endometrial sampling to find out the comparision. [2,5,8]

It is shown from a number of studies that biopsy under hysteroscopic guidance is superior to other methods like dilatation and cirrettage, Pippelle curettage in the evaluation of cause of abnormal uterine bleeding. [3,8,10,15,17,22] The correlation of hysteroscopy with the endometrial histopathology was statistically significant ($p<0.001$). While evaluating the cause of abnormal uterine bleeding in review 15% of patients had intrauterine pathology. The likelihood ratios suggests that diagnostic hysteroscopy is both useful tool in dignosing the disease and also has a good negative predictive value. [13,15,17,19] Another review which analysed the accuracy for endometrial polyps and submucous myomas did not reveal any difference.

In evaluating the patients with abnormal uterine bleeding, the hysteroscopic finding most commonly made out was benign diseases of uterus. [10,12,16] like leiomyoma, poliferative and secretory endometrium. The patients included in the study are all reproductive age group and no case of endometrial carcinoma was made out in our study. In review endometrial polyps were reported in 33.9% of hyteroscopies and it was confirmed by histopathological study in 27.5% of patients. In our study no patient had endometrial polyp which did not go in accordance with the review. The occurrence of endometrial polyp increases with age and are more commonly seen in postmenopausal age group. 10% of post

menopausal bleeding is due to polyp. [63] The study did not go in accordance with the review.

The most frequent intrauterine pathology made out in hysteroscopy was proliferative endometrium (18 patients). The same result has been obtained in histopathological study where the most frequent finding was also the finding of proliferative endometrium (19 patients). 20 patients in our study were in the age group greater than 40 years. In that 5 patients had intrauterine pathology. There was no age related statistically significant difference in the incidence of intrauterine pathology. Although there were several studies which tells that hysteroscope is not much more sensitive in detecting endometrial hyperplasia than dilatation and curettage. [41-44] in our study the positive predictive value of hysteroscopy in detecting the intrauterine pathology was 100% and in endometrial hyperplasia was 80%. The proliferative hyperplasia was seen in 18 patients (36%), whereas in histopathological examination it was seen in 19 patients (38%). The positive predictive value was 100% in detecting proliferative endometrium when correlated with the histopathological examination.

The secretory endometrium was seen in 8 patients (16%) through the hysteroscope. In histopathology it was seen in 9(18%) of our

patients. The positive predictive value was 100% when compared with the studies is low. These datas are not in accordance..

Hyperplasia was diagnosed in hysteroscopy in 10 patients. Out of the 10 patients with hyperplasia in hysteroscopy, two patients suspected to have complex hyperplasia. In histopathological examination 6 patients showed simple hyperplasia and 2 patients suspected to have complex hyperplasia was confirmed in HPE. The complex hyperplasia was suspected in 2 patients due to the increased vascularity with haemorrhagic and necrotic areas and it was proved to be complex hyperplasia by the histopathological examination. In complex hyperplasia the glands are more markedly crowded and sometimes shows architectural abnormalities such as papillary infoldings. [62] So hysteroscopy was 100% sensitive and specific in diagnosing complex hyperplasia of endometrium. Hysteroscopy has PPV of 80% in diagnosing hyperplasia.

In 4 patients (8%), the endometrium was atrophic in hysteroscopy. The histopathological analysis of the endometrial tissues in these patients showed atrophic endometrium in all the 4(8%) of patients. 100% sensitive and specific in diagnosing atrophic endometrium.

The incidence of endometrial malignancy was 1% in Nagele's study and 0.6% by Sciarra and Valle. [46] But in our study no patient had

endometrial carcinoma. All the patients included in the group are premenopausal of reproductive age group. Only 2 patients (4%) of them were above 50 years and possibly this explains the reason why no patient in the study was shown to have endometrial carcinoma. Peak incidence of endometrial cancer was found in women in their 70s. Overall 80% of diagnosis occurs in postmenopausal women older than 55 year. [62] In our study to our best no case of endometrial cancer was overlooked.

Clark et al [47] proved in his study that the diagnostic hysteroscopy is accurate in diagnosing endometrial cancer. It has been said that a thick endometrium hinders the view of the uterine cavity in diagnosing the uterine pathology. So hysteroscopy alone is not sufficient. Hysteroscopy along with biopsy is needed. Hysteroscopy without biopsy is therefore unreliable in diagnosing the endometrial malignancy since the difference between premalignant lesion and malignant lesion of the endometrium may be subtle, and hysteroscopy alone is not sufficient. [23] Moreover endometrial biopsy and histopathology of the endometrium is definitely needed to establish the diagnosis of endometrial carcinoma, its type and grade. Also for optimal visualization, diagnostic hysteroscopy to be scheduled in the follicular phase.

Many studies have shown a higher detetion of intrauterine abnormalities especially fibroids. [39-44,47] In our study only submucous

fibroids were reported. The specificity and sensitivity of TVS in diagnosing intrauterine pathology showed considerable variation. Some studies showed it as an accurate test with more than 95% sensitivity for intrauterine lesions. [39.47] In several other studies it was shown to have sensitivity between 60-77%. [12]

10 patients in our study had myoma which has been diagnosed by hysteroscopy. In histopathology 10 patients had leiomyoma. The positive predictive value was 100% in diagnosing the myomas. This is in accordance with the review. Overall hysteroscopy proved to be 100% specific in diagnosing the myomas. The sensitivity and specificity was 100% and positive predictive value was 100% in our study for submucous myomas. The review of studies shows that TVS has a more false negative value in diagnosing intrauterine pathology when compared to diagnostic hysteroscopy and SH. [4,8,13] Sonohysterography and diagnostic hysteroscopy has good accuracy in diagnosing submucous fibroids and endometrial hyperplasia. [39,47] But none of the studies included in the review compared both these diagnostic modalities.

The postmenopausal age group women were not added in our study. The main concern of adding postmenopausal women is that the endometrial thickness is lower in postmenopausal women when compared to women of reproductive age group. This influences the

results of the study. Only one study in the review added postmenopausal women where endometrial thickness and detection of endometrial cancer or hyperplasia was the outcome and a lower cutoff was used for diagnosis which unlikely to influence the results. [27]

Loeffer [25] in his study showed the diagnostic specificity and sensitivity of dilatation and curettage against the hysteroscopic assessment and biopsy and showed 65% sensitivity for dilatation and curettage and 98% sensitivity for hysteroscopy and biopsy. The sensitivity for submucous myoma was 100% in our study when correlated with histopathological analysis. The finding of hyperplasia was in 10 (20%) patients through hysteroscope and in histopathological analysis it was in 8 patients (16%). The positive predictive value was 80%.

Out patient hysteroscopy as a mode of diagnostic modality for abnormal uterine bleeding has gained popularity and is extremely encouraging. Its high diagnostic reliability, less pain, minimally invasive, office procedure all these make this diagnostic hysteroscopy an ideal method for diagnosis and also for follow up of patients with endometrial hyperplasia. The review of the studies about hysteroscopy in abnormal uterine bleeding and its Meta analysis showed that diagnostic hysteroscopy is accurate in diagnosing intrauterine pathologies. It is highly sensitive and is useful clinically. Moreover when compared to

other studies. [5,8,11,16,18] our review confirms that diagnostic hysteroscopy is safe and no complication has been in our study. Technical failures and patient discomfort were not reported in any of the patients included in our study. All the patients taken for the study underwent hysteroscopy successfully.

The reproducibility of hysteroscopy was not studied in any of the studies included. [1-10] There is a possibility of getting inter-rater variability in test performance. It occurs both in the sense of estimates of test characteristics and in the actual interaction of the diagnostic instrument with the patient. This explains some of the marked variability between most studies and may impact on the interpretation of the likelihood ratios and their application in the evaluation. The absence of the study regarding this part makes it difficult to predict what effect variability may have if hysteroscopy is repeated. In future studies the inter-rater variability should be reported to assess this effect in evaluation of abnormal uterine bleeding by diagnostic hysteroscopy. Future studies should include the establishment of its clinical usefulness. For example, a testing algorithm could be developed where TVS is performed, and in circumstances like centrally located fibroids, endometrium greater than 12mm, a saline hysterogram is performed. This is then made to compare with the diagnostic hysteroscopy.

Hysterectomy specimens were regarded as the criterion which is standard for the verification of intrauterine diseases. The specimens showed the same results as the histopathology of the hysteroscopic biopsy samples in 2 patients with complex hyperplasia.

Recently hysteroscopy is performed as a vaginoscopic approach. Here no speculum or tenaculum is used and this further reduces the discomfort to the patient. [5,8,10] In our study the patients experienced less or no discomfort under sedation. Even in the post procedure there was remarkably less patient discomfort with the 4.3mm hysterosope, which was used in our study. So diagnostic hysteroscopy offers a better alternative to dilatation and curettage for the diagnosis of intrauterine pathology.

All the patients included in the study were counseled about the procedure and its importance and ease in diagnosis explained. Informed consent obtained. This provided a good environment for the procedure. Also the presence of the assisting theatre staff helped in doing the procedure easily. In the review a few have used paracervical block for hysteroscopy. In our study we used total intravenous anaesthesia (sedation) for most of the cases. For 4 patients (8%) we used paracervical block. There was no significant difference in the patient discomfort between the two. Paracervical block was not preferred since the risk of

intravasation and its subsequent side effects. [18-20] Diagnostic outpatient hysteroscopy provides more complete information concerning the endometrial cavity when compared to dilatation and curettage,[22] revealing a 20% (10) of submucous myoma in the patients studied.

The patients taken for our study are discharged after the procedure. Mainly the patients came back for menstrual irregularities. The histopathology of them studied and treated accordingly.

Table.13 showing sensitivity and specificity plot and pooled results of diagnostic hysteroscopy in the diagnosis of intracavitary abnormalities.

S.No.	Studies	Sensitivity (pooled sensitivity=0.94)	Specificity (pooled specificity=0.89)
1.	Bender et al	0.98	0.78
2	Chachia et al	0.92	0.88
3.	Cochen et al	0.92	1.00
3	Cicinelli et al	0.96	1.00
4	Descarques et al	0.92	0.55
5	Dueholm et al	0.84	0.88
6	Garuti et al	0.94	0.87
7	Loverro et al	1.00	0.93
8.	Ludwin et al	0.94	1.00
9.	Ossola et al	0.98	0.63
10.	Paschoupoulos et al	0.94	0.92
11.	Schwarzier et al	0.90	0.91
12.	Sousa et al	0.98	0.71
13.	Towbin et al	0.92	0.39
14.	Our study	1.00	1.00

Analysis of the above data shows that diagnostic hysteroscopy as an out patient procedure is a most reliable method in assessing the intrauterine pathology in patients of abnormal uterine bleeding. It also has higher patient acceptable rate. It is now used as an office procedure for the patients with menstrual irregularities and excessive bleeding. It also provides the treating gynaecologist with more information regarding the endometrial pathology than the convention dilatation and curettage.

Table.14 showing meta-analysis on the diagnostic accuracy of hysteroscopy in evaluation of uterine cavity stratified by different subgroups.

Studies	No.	Menopausal status	Co	No. of failed procedures	Reference test	Inclusion criteria
Bender et al	160	Pre & post menopausal	100	Unknown	Biopsy or D&C	AUB
Chachia et al	84	Premenopausal	100	Unknown	Hysterectomy/ operative hysteroscopy or D&C	AUB
Cicinelli et al	50	Pre & post menopausal	100	0	Hysterectomy	Schedulaed Hysterectomy
Cohan et al	15	Post menopausal	100	Unknown	Operative hysteroscopy or D&C	PMB or USG> 6mm ET
Descarques et al	38	Pre & post menopausal	100	0	Biopsy or D&C	AUB or PMB
Dueholm et al	108	Premenopausal	98	3	Hysterectomy	Scheduled hysterectomy
Loverro et al	106	Postmenopausal	100	0	Biopsy	PMB
Ludwin et al	47	Postmenopausal	100	0	Hysterectomy or operative hysteroscopy or biopsy	PMB or USG>5mm ET
Ossola et al	55	Pre & post Menopausal	100	0	Operative hysteroscopy or D&C or biopsy	AUB or PMB
Schwarzler et al	104	Pre & post Menopausal	100	0	Biopsy	Failed medical Therapy in AUB
Sousa et al	88	Postmenopausal	86	15	Biopsy or D&C	PMB
Our study	50	Premenopausal	100	0	Hysteroscopy guided Biopsy	AUB

Whenever patients of reproductive age group and also postmenopausal group complaints of any menstrual problem it is advisable to do an endometrial sampling. It is now easily done through hysteroscopy. Always the diagnostic hysteroscopy is done along with biopsy and histopathological analysis correlated.

LIMITATIONS

The number of patients enrolled in the study was less and so statistically significant inferences could not be made with regard to various factors. There are also errors and subjective variation in the assessment and characterization of lesions observed during the procedure. This study cannot be generelised to all socio economic groups, since this study is undertaken in lower socio economic group. Also the histological correlation between the diagnosis of hysteroscopy and the histopathological findings was studied and it showed a good correlation which concluded that hysteroscopy is more accurate. The significance of the small lesions which was missed by ultrasound and other investigations but diagnosed by ultrasound was doubtful.

SUMMARY

Title: Role of Diagnostic Hysteroscopy in Evaluation of Abnormal Uterine Bleeding in women of reproductive age group and its histopathological correlation.

Sample size: 50 patients.

Design: Prospective study.

Procedure done : Hysteroscopy and endometrial sampling and Histopathological analysis of the sample.

Study objective:

1. To identify the cause of abnormal uterine bleeding.

2. To identify any endometrial lesions like fibroid or polyp.

3. To evaluate the endometrial surface for the presence of hyperplasia.

4. To obtain endometrial curretings for histopathological evaluation and its correlation with the hysteroscopic findings.

Study Conclusion:

- 44 patients (88%) are multiparous and 6 patients (12%) are nulliparous. No difficulty was encountered in insertion of the hysteroscope between the two groups.
- 42 patients (84%) had menorrhagia as their compliant.
- 30 patients delivered by vaginal delivery and 14 delivered by caesarian section. No difficulty was encountered among them in insertion of hysteroscope.
- No patient in the study had any complication during or after the procedure.
- 10 patients had submucous myoma in hysteroscopy which was proved by the HPE report.
- 4 patients had atrophic endometrium in hysteroscopy confirmed in HPE.
- 10 patients had hyperplastic features in hysteroscopy. In that 8 confirmed to have hyperplasia, 2 had complex hyperplasia and 6 had simplex hyperplasia.
- 18 patients had proliferative endometrium in hysteroscopy. In HPE 19 patients had proliferative endometrium.
- 8 patients had secretory endometrium in hysteroscopy. In HPE 9 patients had secretory endometrium.

- Hysteroscopy was found to be 100% sensitive and specific in diagnosis of endometrial lesion.
- No patient included in the study had endometrial carcinoma or endometrial polyp.

CONCLUSION

50 patients with abnormal uterine bleeding were included in the study. The most common pattern of bleeding in these patients was cyclical and excessive bleeding. A few patient had intermenstrual bleeding. All the patients were in the reproductive age group.

Hysteroscopy was done in all patients with informed consent under intravenous anaesthesia. The hysteroscope used for the purpose was 4.3mm hysteroscope. This is done as an outpatient procedure and the diagnosis arrived. There was no major complications and patient discomfort was less with this diameter hysteroscope. It proved to be a safe and simple procedure in diagnosing intrauterine pathologies and various other causes in patients with abnormal uterine bleeding.

The 30 degree hysteroscope used provided a clearer view of the endometrial cavity and biopsies were taken from sites which was suspicious. Even small areas of endometrial thickening, alterations in vasculature, consistency of endometrium are clearly made out with this. This facilitated easy biopsy at that site. The pathological correlation was also good when the biopsy was taken from the suspiscious sites.

In these group of patients the most common intrauterine abnormality was submucous myoma made out by hysteroscope and confirmed by histopathological examination. 10 patients had hyperplastic endometrium. Those patients suspected to have complex hyperplasia through hysteroscope was confirmed by HPE. The hysteroscopic findings were correlated with the histopathological findings.

The results obtained showed a sensitivity of 100% and positive predictive value of 100% for hysteroscopy in diagnosing endometrial pathology. Considering all the factors together diagnostic hysteroscopy is both accurate and a feasible investigation in evaluating various causes of abnormal uterine bleeding especially the endometrial pathologies.

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PROFORMA

Name : Age : Unit :

IP/OP No. : DOA DOS DOD

Socioeconomic status :

Parity index :

Chief complaints :

Menstrual history :

Pattern of bleeding :

1. Cyclical and excessive
2. Polymenorrhoea
3. Intermenstrual

Associated symptoms:

Marital H/O :

Obstetric H/O :

LCB :

No. of abortion :

Spontaneous :

Induced :

Contraception practiced/not : If yes

Natural :

Barrier :

OCP :

IUCD :

Sterilized : Yes : PS/LS/interval sterlisation

General examination :

Built

Pallor

Pedal edema

Temperature

Breast

Thyroid

Pulse rate

BP

CVS

RS

P/A

VIA/VILI

P/V

Investigations:

Hb	
Urine routine	
Blood group	
TC,DC,PCV	
Platelet count	
BT/CT	
Urea, creatinine	
Sugar	
VDRL/HIV/HbsAG	
Chest x-ray	
ECG	
PAP smear	
Ultrasound	

Anaesthesia :

Distension medium :

Hysteroscopic findings :

Findings:

Endocervical canal	
Internal os	
Tubal ostia	
Endometrial cavity	
Glandular pattern	
Vascular pattern	

Histopathological report of Hysteroscopic endrometrial sample :

Hysterectomy :

Histopathological report Hysterectomy specimen :

CONSENT FORM

Yourself Mrs. …….....…… are being asked to be a participant in the research study titled **"ROLE OF DIAGNOSTIC HYSTEROSCOPY IN EVALUATION OF ABNORMAL UTERINE BLEEDING IN WOMEN OF REPRODUCTIVE AGE GROUP AND ITS HISTOPATHOLOGICAL CORRELATION"** in CMC Hospital, Coimbatore, conducted by Dr. L.LATHA, Post Graduate student, Department of Obstetrics and Gynaecology, Coimbatore Medical College. You are eligible after looking into the inclusion criteria. You can ask any question you may have before agreeing to participate.

RESEARCH BEING DONE

ROLE OF DIAGNOSTIC HYSTEROSCOPY IN EVALUATION OF ABNORMAL UTERINE BLEEDING IN WOMEN OF REPRODUCTIVE AGE GROUP AND ITS HISTOPATHOLOGICAL CORRELATION

PURPOSE OF RESEARCH

To study the role diagnostic hysteroscopy in evaluating the various causes of AUB.

DECLINE FROM PARTICIPATION

You have the option to decline from participation in the study existing protocol for your condition.

PRIVACY AND CONFIDENTIALITY

Privacy of individuals will be respected & any information about you or provided by you during the study will be kept strictly confidential.

AUTHORISATION TO PUBLISH RESULTS

Results of the study may be published for scientific purposes and /or present to scientific groups.

STATEMENT OF CONSENT

I volunteer and consent to participate in this study. I have read the consent or it has been read to me. The study has been fully explained to me and I may ask questions at any time.

…… …….....……

Signature / left thumb impression Date:

(Volunteer)

…….. …….....…….

Signature of witness

KEYWORDS TO MASTER CHART

SES	-	Socioeconomic Status
C/O	-	Complaints Of
H/O	-	History Of
M	-	Months
RMP	-	Regular Menstrual Cycles.
EPMB	-	Excessive Premenstrual Bleeding.
CYL	-	Cyclical
ACYL	-	Acylical
LN	-	Labour Natural
PS	-	Puerperal Sterilisation
IS	-	Interval Sterilisation.
LS	-	Laproscopic Sterilisation
IMB	-	Inter Menstrual Bleeding
NUL	-	Nulliparous.
P	-	Parity
L	-	Live child.
A	-	Abortion.
Polymeno	-	Polymenorrhoea.
WD	-	White Discharge.
AV	-	Anteverted.
RV	-	Retroverted.

WKS	-	Weeks
NS	-	Normal Saline
TIVA	-	Total Intra Venous Anaesthesia
PCB	-	Para Cervical Block.
N	-	Normal
Intr	-	Intermediate
Infl	-	Inflammatory.
USG	-	Ultrasonogram
ECC	-	Endo Cervical Canal
TO	-	Tubal Ostia
E/G	-	External Genitalia
LE	-	Local Examination.
PR	-	Pulse Rate.
BP	-	Blood Pressure.
P/A	-	Per Abdomen
Hb%	-	Haemoglobin
UCL	-	Uterocervical Length.
DIS	-	Distension medium
Anaes	-	Anaesthesia
S/T	-	Sterilisation
A.O.M	-	Age Of Menarche
O/H	-	Obstetric History

MASTER CHART

S. No	Name	Age	I.P.NO	SES	Parity	D.O.A	D.O.S	C/O	Duration	Previous Menstrual H/O	A. O. M	Bleeing pattern	Asso C/O	O/H	S/T
1	Fathimamary	43	23228	Low	P3L	22.4.13	24.4.13	MENORRHAGIA	6 M	RMP3/30	13	EPMB	NO	LN	PS
2	Thilagavathy	42	25184	Low	P2L2	2.5.13	4.5.13	MENORRHAGIA	5M	RMP3/32	14	CYL	NO	LN	IS
3	Prema latha	46	30481	Low	P2L2	2.5.13	24.5.13	MENORRHAGIA	1 YR	RMP5/30	12	ACYCL	NO	LN	NO
4	Latha	33	30484	Low	P2L2	22.5.13	24.5.13	MENORRHAGIA	2M	RMP3/30	13	CYC	NO	LN	PS
5	Sheela	36	32090	Low	NUL	28.5.13	1.6.13	POLYMENO	3M	RMP428	11	ACYCLI	NO	LN	NO
6	Thangam	50	28875	Low	P3L3	28.5.13	1.6.13	MENORRHAGIA	15M	RMP3/30	13	IMB	NO	LN	IS
7	Neelavathy	40	35395	Low	P3L4	13.6.13	15.6.13	MENORRHAGIA	13M	RMP5/35	12	EPMB	NO	CS	PS
8	Pappathy	43	35400	Low	P2L2	6.6.13	15.6.13	MENORRHAGIA	17M	RMP3/30	13	IMB	NO	CS	IS
9	Latha	42	37798	Low	P2L2	13.6.13	26.6.13	MENORRHAGIA	11M	RMP3/30	14	CYC	NO	CS	IS
10	Revathi	36	3846	Low	P3L2	25.6.13	29.6.13	MENORRHAGIA	22M	RMP3/30	12	CYC	NO	CS	PS
11	Selvi	35	3845	Low	P3L3	25.6.13	29.6.13	MENORRHAGIA	6M	RMP3/40	13	ACYC	WD	CS	IS
12	Pongiyammal	42	441	Low	P5L4	1.1.13	4.1.13	MENORRHAGIA	13M	RMP3/30	11	IMB	NO	LN	IS
13	Gandhimathi	47	1303	Low	P3L3	1.1.13	11.1.13	MENORRHAGIA	16M	RMP4/35	13	ACY	NO	LN	IS
14	Leelavathy	37	3020	Low	P3L3	17.1.13	18.1.13	MENORRHAGIA	22M	RMP3/30	12	CYC	NO	LN	PS
15	Muthammal	39	3035	Low	P4L2	14.1.13	18.1.13	MENORRHAGIA	5M	RMP6/30	13	IMB	NO	LN	NO
16	Kalamani	45	3109	Low	P3L3	28.1.13	1.2.13	MENORRHAGIA	6M	RMP3/30	12	EPMB	NO	LN	IS
17	Kameshwari	35	3769	Low	P3L2	28.1.13	1.2.13	POLYMENO	14M	RMP3/30	13	CYC	NO	LN	PS
18	Thangamani	34	7299	Low	P1LO	25.1.13	1.2.13	MENORRHAGIA	22M	RMP4/35	11	CYC	NO	CS	NO
19	Jothimani	42	7274	Low	P2L2	13.2.13	15.2.13	MENORRHAGIA	26M	RMP3/30	13	ACYCL	NO	CS	PS
20	Rathna	29	14064	Low	NUL	17.3.13	19.3.13	METRORRHAGIA	13M	RMP5/30	12	IMB	NO	CS	NO
21	Vijayalakshmi	45	16424	Low	P3L3	20.3.13	23.3.13	METRORRHAGIA	22M	RMP3/30	12	IMB	WD	LN	PS
22	Kani	40	16958	Low	P2A1	19.3.13	22.3.13	MENORRHAGIA	14M	RMP5/32	11	CYC	NO	LN	NO
23	Vijayalakshmi	49	18804	Low	NUL	25.3.13	2.4.13	MENORRHAGIA	15M	RMP3/30	11	CYC	NO	LN	NO
24	Rajalakshmi	41	18419	Low	P3L3	27.3.13	2.4.13	POLYMENO	20M	RMP3/28	13	ACYC	NO	CS	PS
25	Maheswari	47	22089	Low	NUL	1.4.13	2.4.13	MENORRHAGIA	22M	RMP3/30	12	ACYC	NO	CS	NO
26	Jeyalakshmi	26	18854	Low	P2L2	1.4.13	2.4.13	MENORRHAGIA	4M	RMP5/30	11	IMB	NO	LN	PS

S. No	Name	Age	I.P.NO	SES	Parity	D.O.A	D.O.S	C/O	Duration	Previous Menstrual H/O	A. O. M	Bleeing pattern	Asso C/O	O/H	S/T
27	Vijaya	48	23544	Low	P2L1	18.4.13	23.4.13	MENORRHAGIA	6M	RMP3/30	13	IMB	NO	LN	NO
28	Saroja	42	29227	Low	P3L3	25.4.13	30.4.13	MENORRHAGIA	5m	RMP5/35	12	EPMB	NO	LN	IS
29	Selvi	40	28017	Low	P2L2	28.4.13	30.4.13	MENORRHAGIA	9m	RMP3/30	15	CYC	WD	CS	PS
30	Mahalakshmi	30	30297	Low	NUL	22.5.13	24.5.13	MENORRHAGIA	11m	RMP4/30	12	CYC	NO	CS	NO
31	Vijayalakshmi	41	32143	Low	P2L2A1	3.6.13	5.6.13	POLYMENO	12m	RMP3/28	13	ECYC	NO	LN	PS
32	Sulochana	40	33688	Low	P3L3	12.6.13	18.6.13	MENORRHAGIA	10m	RMP3/30	11	EPMB	NO	LN	IS
33	Subbulakshmi	46	37598	Low	P1L1	22.6.13	25.6.13	MENORRHAGIA	16m	RMP3/30	16	IMB	NO	CS	NO
34	Mariyammal	46	37548	Low	P2L2	20.6.13	25.6.13	MENORRHAGIA	12m	RMP3/30	13	IMB	NO	CS	PS
35	Palaniyammal	40	38281	Low	P4L4A1	26.6.13	28.6.13	MENORRHAGIA	28m	RMP5/30	12	IMB	NO	CS	PS
36	Lakshmi	41	39087	Low	P3L2A1	28.6.13	1.7.13	POLYMENO	12m	RMP3/30	12	CYC	NO	LN	PS
37	Primala	40	41325	Low	P2L2	12.6.13	18.7.13	MENORRHAGIA	12m	RMP4/30	12	CYC	WD	LN	IS
38	Neelammal	50	38216	Low	P4L3	12.6.13	18.7.13	MENORRHAGIA	3m	RMP3/30	13	ECYC	WD	LN	PS
39	Sarojini	37	37682	Low	P2L2	28.5.13	15.7.13	MENORRHAGIA	7m	RMP3/30	14	ECYC	NO	LN	PS
40	Fathima	49	44481	Low	P4L4A1	26.6.13	26.7.13	MENORRHAGIA	9m	RMP5/32	11	EPMB	NO	LN	PS
41	Dhanalaksmi	39	45368	Low	P3L2A1	18.7.13	26.7.13	MENORRHAGIA	8m	RMP3/30	13	CYC	NO	LN	IS
42	Indrani	37	46761	Low	P2L2	27.7.13	6.8.13	MENORRHAGIA	10m	RMP3/30	12	CYC	NO	LN	PS
43	Mary	48	47325	Low	P3L2	10.8.13	14.8.13	METRORRHAGIA	11m	RMP5/30	13	EPMB	NO	CS	IS
44	Renuka	43	50708	Low	P2L2	25.8.13	30.8.13	MENORRHAGIA	21m	RMP3/30	13	CYC	NO	LN	PS
45	Sameena	40	53056	Low	P2L2	1.9.13	3.9.13	POLYMENO	2m	RMP4/32	13	CYC	NO	LN	IS
46	Savithiri	40	49881	Low	P1L1	1.9.13	3.9.13	MENORRHAGIA	6m	RMP3/30	11	ECYC	WD	LN	NO
47	Saraswathy	46	50664	Low	NUL	27.7.13	3.9.13	MENORRHAGIA	7m	RMP4/35	10	ECYC	NO	CS	NO
48	Prema	39	50132	Low	P1L2	24.7.13	3.9.13	MENORRHAGIA	11m	RMP3/30	12	IMB	NO	CS	NO
49	Sivagami	45	53344	Low	P3L3	1.9.13	4.9.13	MENORRHAGIA	14	RMP3/30	11	IMB	NO	LN	PS
50	Jeyamani	33	52112	Low	P2L2	2.9.13	6.9.13	MENORRHAGIA	6m	RMP3/30	13	CYC	NO	LN	IS

S.NO	PR	BP	P/A	L/E of E/G	VIA VILI	P/V	Hb%	Pap Smear	UCL	Dis	Anaes
1	80	N	NAD	NAD	N	Anteverted, Normal	9.6	N	8	NS	TIVA
2	84	N	NAD	NAD	N	Anteverted 12wks	9.8	Intr	8.5	NS	TIVA
3	74	N	NAD	NAD	N	Anteverted, Normal	10.2	N	11	NS	TIVA
4	76	N	NAD	NAD	N	Anteverted,Normal	10	N	7	NS	TIVA
5	76	N	NAD	NAD	N	Retroverted,12wks	10.8	N	8	NS	TIVA
6	78	N	NAD	NAD	N	Anteverted,14wks	8.6	N	9	NS	TIVA
7	86	N	NAD	NAD	N	Anteverted,10wks	8.8	N	8.5	NS	PCB
8	82	N	NAD	NAD	N	Retroverted, Normal	9.8	N	8	NS	TIVA
9	80	N	NAD	NAD	N	Anteverted,8wks	11	Intr	8	NS	TIVA
10	88	N	NAD	NAD	N	Anteverted 10wks	10.2	N	8	NS	TIVA
11	74	N	NAD	NAD	N	Anteverted,12wks	8.6	Infl	8.5	NS	TIVA
12	78	N	NAD	NAD	N	Anteverted,Normal	8.8	N	9	NS	TIVA
13	78	N	NAD	NAD	N	Anteverted 14wks	9	N	9	NS	TIVA
14	80	N	NAD	NAD	N	Retroverted,12wks	9.4	N	8.5	NS	TIVA
15	84	N	NAD	NAD	N	Anteverted,Normal	8.4	N	8	NS	TIVA
16	86	N	NAD	NAD	N	Anteverted ,10wks	8.8	N	8	NS	TIVA
17	74	N	NAD	NAD	N	Anteverted,12wks	9.0	N	8.5	NS	TIVA
18	74	N	NAD	NAD	N	Anteverted,12wks	9.6	Int	8	NS	TIVA
19	76	N	NAD	NAD	N	Anteverted, Normal	9.6	N	8	NS	TIVA
20	80	N	NAD	NAD	N	Anteverted, Normal	9.4	Int	8.5	NS	TIVA
21	88	N	NAD	NAD	N	Retroverted,14wks	10.2	N	9	NS	PCB
22	78	N	NAD	NAD	N	Retroverted,12wks	8.6	N	9.5	NS	TIVA
23	86	N	NAD	NAD	N	Retroverted,12wks	8.8	N	8	NS	TIVA
24	84	N	NAD	NAD	N	Anteverted,10wks	9.4	N	8	NS	TIVA
25	80	N	NAD	NAD	N	Anteverted,10wks	9.6	N	8	NS	TIVA
26	82	N	NAD	NAD	N	Anteverted,Normal	8.8	N	8.5	NS	TIVA
27	78	N	NAD	NAD	N	Anteverted,Normal	8.4	Inf	8	NS	TIVA
28	72	N	NAD	NAD	N	Retroverted10wks	8.2	N	9.5	NS	TIVA
29	74	N	NAD	NAD	N	Anteverted, Normal	9.2	N	8.5	NS	TIVA

S.NO	PR	BP	P/A	L/E of E/G	VIA VILI	P/V	Hb%	Pap Smear	UCL	Dis	Anaes
30	78	N	NAD	NAD	N	Anteverted, Normal	10.2	Int	8.0	NS	TIVA
31	80	N	NAD	NAD	N	Retroverted, Normal	9.6	Inf	9.5	NS	TIVA
32	76	N	NAD	NAD	N	Anteverted,8wks	8.4	Int	9	NS	PCB
33	74	N	NAD	NAD	N	Anteverted,10wks	8.4	N	8.5	NS	TIVA
34	82	N	NAD	NAD	N	Retroverted,12wks	9.6	N	8.5	NS	TIVA
35	86	N	NAD	NAD	N	Anteverted,8wks	8.8	N	8	NS	TIVA
36	80	N	NAD	NAD	N	Anteverted,10wks	10.6	N	8	NS	TIVA
37	84	N	NAD	NAD	N	Anteverted,10wks	9	Inf	9	NS	TIVA
38	80	N	NAD	NAD	N	Anteverted,12wks	8.	Int	9	NS	TIVA
39	88	N	NAD	NAD	N	Retroverted,8wks	9.6	N	9.5	NS	TIVA
40	82	N	NAD	NAD	N	Anteverted, Normal	9.5	Int	8.5	NS	TIVA
41	76	N	NAD	NAD	N	Anteverted,12wks	9.3	Int	8.0	NS	TIVA
42	76	N	NAD	NAD	N	Anteverted, Normal	9.8	n	7	NS	TIVA
43	78	N	NAD	NAD	N	Anteverted, Normal	8.0	N	7.5	NS	TIVA
44	80	N	NAD	NAD	N	Retroverted, Normal	8.7	N	10	NS	TIVA
45	84	N	NAD	NAD	N	Anteverted,10wks	10.4	N	9.5	NS	TIVA
46	88	N	NAD	NAD	N	Anteverted,12wks	9.5	Int	8	NS	TIVA
47	80	N	NAD	NAD	N	Anteverted,16wks	8.8	N	7.5	NS	PCB
48	78	N	NAD	NAD	N	Anteverted,12wks	9,6	Inf	8	NS	TIVA
49	74	N	NAD	NAD	N	Anteverted, Normal	8.9	N	10	NS	TIVA
50	76	N	NAD	NAD	N	Retroverted,10wks	10.7	N	8.5	NS	TIVA

S.No.	HPE No.	USG	ECC	T.O	Endometrial cavity	Vascularity	HPE
1	G533	N	N	Patent	Proliferative endometrium	No	Proliferative endometrium
2	G590	Bulky uterus	N	Patent	Secretory endometrium	No	Secretory endometrium
3	G710	Thickened endometrium	N	Patent	Proliferative endometrium	No	Proliferative endometrium
4	G741	Bulky uterus	N	Patent	Submucous myoma	No	Leiomyoma with early proliferative endometrium
5	G765	N	N	Patent	Proliferative endometrium	No	Secretyory endometrium
6	G763	N	N	Patent	Submucous myoma	No	Leiomyoma with late proliferative endometrium
7	G842	Submucous myoma	N	Patent	Submucous myoma	No	Leiomyoma with secretory endometrium
8	G844	N	N	Patent	Proliferative endometrium	No	Late proliferative endometrium
9	G902	Bulky uterus	N	Patent	Secretory endometrium	No	Secretory phase-no hyperplasia
10	G928	Thickened endometrium	N	Patent	Hyperplastic endometrium	No	Simple hyperplasia
11	G930	intramural myoma	N	Patent	Proliferative endometrium	No	Early proliferative with no hyperplasia
12	G08	N	N	Patent	Atrophic endometrium	No	Atrophic endometrium
13	G24	Ovarian cyst	N	Patent	Proliferative endometrium	No	Late proliferative endometrium
14	G70	Bulky uterus	N	Patent	Proliferative endometrium	No	Proliferative endometrium.
15	G69	Thickened endometrium	N	Patent	Secretory endometrium	No	Secretory endometrium
16	G146	Endometrium hyperplasia	N	Patent	Hyperplastic endometrium	Yes	Complex hyperplasia
17	G163	N	N	Patent	Proliferative endometrium	No	Proliferative et with simple hyperplasia
18	G162	N	N	Patent	Hyperplastic endometrium	No	Secretory et with simple hyperplasia
19	G183	N	N	Patent	Atrophic endometrium	No	Atrophic endometrium
20	G326	Ovarian cyst	N	Flimsy adhesions	Proliferative endometrium	No	Proliferative endometrium
21	G348	Submucous myoma	N	Patent	Submucous myoma	No	Leiomyoma with secretory endometrium
22	G346	Submucous fibroid	N	Patent	Submucous fibroid	No	Leiomyoma with secretory endometrium
23	G407	Endometrium hyperplasia	N	Patent	Hyperplastic endometrium	No	Simple hyperplasia
24	G441	Thickened endometrium	N	Patent	Secretory endometrium	No	Secretory endometrium
25	G436	N	N	Patent	Proliferative endometrium	No	Late proliferative endometrium

26	G435	N	N	Patent	Proliferative endometrium	No	Lateproliferative
27	G528	N	N	Patent	Hyperplastic endometrium	Yes	Complex hyperplasia
28	G559	Bulky uterus	N	Patent	Hyperplastic endometrium	No	Proliferative endomerium
29	G560	N	N	Patent	Atrophic endometrium	No	Atrophic endometrium
30	G720	Thickened endometrium	N	Patent	Submucous myoma	No	Leiomyoma with late proliferative endometrium
31	G815	Submucous myoma	N	Flimsy adhesions	Submucous myoma	No	Leiomyoma with secretory endometrium
32	G854	Intramural myoma	N	Patent	Hyperplastic endometrium	No	Secretory endometrium
33	G912	N	N	Patent	Proliferative endometrium	No	Late proliferative endometrium
34	G923	N	N	Patent	Proliferative endometrium	No	Late proliferative endometrium
35	G1073	Bulky uterus	N	Patent	Secretory endometrium	No	Simple hyperplasia
36	G1015	Thickened endometrium	N	Patent	Proliferative endometrium	No	Proliferative endometrium
37	G1014	N	N	Patent	Secretory endometrium	No	Secretory endometrium
38	G1065	N	N	Patent	Proliferative endometrium	No	Late proliferative endometrium
39	G1088	Hypernplastic endometrium	N	Patent	Hyperplastic endometrium	No	Simple hyperplasia
40	G1126	Hyperplastic endometrium	N	Patent	Submucous myoma	No	Leiomyoma with adenomyosis
41	G1172	Bulky uterus	N	Patent	Secretory endometrium	No	Secretory endometrium
42	G1264	Ovarian cyst	N	Patent	Proliferative endometrium	No	Proliferative endometrium
43	G1306	N	N	Patent	Atrophic endometrium	No	Atrophic endometrium
44	G1305	N	N	Patent	Proliferative endometrium	No	Late proliferative endometrium
45	G1307	Thickened endometrium	N	Patent	Hyperplastic endometrium	No	Simple hyperplasia
46	G1304	N	N	Patent	Secretory endometrium	No	Secretory endometrium
47	G1318	Bulky uterus	N	Patent	Proliferative endometrium	No	Proliferative endometrium
48	G1324	N	N	Patent	Hyperplastic endometrium	No	Secretory et with simple hyperplasia
49	G1328	Hyperplastic endometrium	N	Patent	Submucous myoma	No	Leiomyoma with late proliferative endometrium
50	G1336	Submucous myoma	N	Flimsy adhesions	Submucous myoma	No	Leiomyoma with secretory endometrium