COMPARATIVE STUDY OF DIAGNOSTIC HYSTEROSCOPY IN ABNORMAL UTERINE BLEEDING AND ITS HISTOPATHOLOGICAL CORRELATION

Dissertation submitted

In partial fulfillment of the requirements for the degree of

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OBSTETRICS AND GYNAECOLOGY

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CERTIFICATE

This is to certify that the dissertation entitled **'Comparative study of diagnostic hysteroscopy in abnormal uterine bleeding and its histopathological correlation'** is the bonafide original work of **Dr. K. Shanmugapriya** under the guidance of **Prof. Dr.Ramola Janet Diana. MD, DGO, HOD,** Department of Obstetrics and Gynecology**Tirunelveli Medical college** ,Tirunelveli in partial fulfillment of the requirements for the degree of M.D branch II Obstetrics and Gynecology examination of the Tamilnadu Dr. M.G.R Medical University to be held in April 2012.

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DECLARATION

I, **Dr. K. Shanmugapriya,** declare that the dissertation titled **“Comparative study of diagnostic hysteroscopy in abnormal uterine bleeding and its histopathological correlation"** has been prepared by me.

This is submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai, in partial fulfillment of the requirement for the award of M.D. Degree, Branch II (OBSTETRICS & GYNAECOLOGY) degree Examination to be held in April 2012.

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CONTENTS

INTRODUCTION

Although uterine bleeding is a normal physiologic episodic occurrence for most women, its characteristics nevertheless vary considerably. The broad range of normal variation causes difficulty in identifying abnormal patterns. 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. Traditionally , Dilatation and Curettage and Ultrasonography were the most common investigations employed in the evaluation of the causes of abnormal uterine bleeding[1].

Dilatation and Curettage is a blind procedure and the endometrium has to be sent to the Pathologist to study histological patterns and for the report. The co-operation of the Pathologist is important. Ultrasonography clearly depicts the uterine contour and the status of the ovary, but fails to provide adequate information regarding the endometrium.

Hysteroscopy has ushered a new era in the evaluation of abnormal uterine bleeding. By direct visualization of the uterine cavity , it is possible to pin point the etiology in the majority of the cases. It can accurately detect endometrial

hyperplasia and aids in the early diagnosis of endometrial carcinoma and uterine polyps.

Abnormal uterine bleeding is one of the most common complaints with which a patient presents to a Gynaecologist. D&C has long been the diagnostic gold standard for abnormal uterine bleeding. However only 70% - 80% of the endometrium can be curetted. Polyps and sub mucous fibroids are frequently undetected by curettage alone[1].

The judicious use of hysteroscopy to manage this medical entity adds a new dimension in handling this often perplexing problem.

AIMS AND OBJECTIVES

This study has been taken up to analyze the place of hysteroscopy in the evaluation of Abnormal Uterine Bleeding in terms of accuracy of hysteroscopic findings and the contribution of the procedure to clinical diagnosis. It also aims to correlate hysteroscopic findings with histopathological results.

REVIEW OF LITERATURE

HISTORICAL REVIEW:

"A vigilant eye in the uterine cavity is better than numerous blind curettages", quoted **Lindmann**[2], about the future of hysteroscopy. Observation ranks with percussion, auscultation and palpation as one of the principal methods of clinical examination. For this reason, physicians sought a simple method to look into the cavities of the human body. Until the beginning of the 20th century, this possibility existed only for external orifices.

Archigenesof Apameia already had a grasp of illumination procedures, "**et hoc ad claremlucemsiat**." Subsequently anal and vaginal specula were developed from simple tubes to more complex instruments for dilatation and observation. Various methods were devised using systems of concave mirrors and lenses, to collect and focus light from natural and artificial sources and direct it into a cavity[2].

History of endoscopy really begins in the early years of the 19th century. In 1805, **Bozzini**(1773-1809) constructed a device called a light conductor that enabled him to inspect various passages and body cavities. In 1864, **Aubinais**observed a baby's head emerge from the cervix with a tube he inserted into the vagina, and for this reason he has been described incorrectly as the first hysteroscopist.

The first hysteroscopy (also called as metroscopy or uteroscopy) was described in 1869 by **Pantaleoni**[3]. Polypoid endometrial growths were observed by him. Pantaleoni used reflected candle from a concave mirror to illuminate the uterine cavity. In 1893, **Morris**[2] used a straight silver and brass tube. He observed tubal ostia and endometrium. Bleeding and mucous obstructed his vision. So a new type of hysteroscopy was proposed by **Beutner**[5] in 1898 which was equipped with water sprinkler .

In 1907, **David** demonstrated the first contact hysteroscopy, which was useful for diagnosis of uterine disorders. In 1914, **Heineberg**[6] devised a system for irrigating the uterine cavity to rinse off the blood that often covered the lens and hindered the lesion. In 1925, **Rubin**[7] insufflated the uterine cavity with CO_2 instead of water. In 1927, **Mikulicz-Radecki**and **Freund**[2] collaborated to produce a 'curettoscope' with biopsy taking capability and cornual electro coagulation.

In 1928, **Gauss**[8] succeeded in taking intrauterine photography. In 1934, **Schroeder** collected important data on the intrauterine pressure during hysteroscopy. He succeeded in developing an instrument with an excellent forward viewing optical system. It thus became possible to inspect large areas of the cavity and to observe three-dimensional views.

Other pioneers of hysteroscopy during these years (1934-1943) were **Bank**, **Schack**and **Segond**[9]. **Norment**[10] in 1943 reported a new technique that called for transparent rubber balloon mounted on the tip of hysteroscope and illumination provided by an external light. **Mohri**[11] and colleagues (1953-1978) reported on the possibility of embryoscopy and also introduced the first tubaloscope.

Englund[12] and colleagues recommended hysteroscopy for uterine bleeding in 1957. In 1962, Sinander studied endometrial carcinoma using silastic balloon. A new era in hysteroscopy began with the introduction of viscous fluid as media for distending the uterine cavity. **Menken**[13] in 1968 used Loviscol, a poly-vinyl pyrrolidine as distension media. **Edstrom** and **Fernstrom**used Dextran (32%); **Lindemann**[14] used CO_2 as distending media in 1972. In 1979, **Nitze**[4] demonstrated a cystoscope with distal illumination, thus the present era in endoscopy began. The Nitze principleof endoscopy was not adopted for hysteroscopy .

In 1979 **Baggish**[15] reported his first experience with contact hysteroscope. In 1981, **Hamou**[16] demonstrated microhysteroscope, modern panoramic hysteroscopy with a variation of contact hysteroscopy in a single endoscope. Panoramic hysteroscope and all channel operating sheath was described

by**Baggish**in 1987. Recently Baggish also developed a special dual channel hysteroscope for intrauterine laser surgery[17].

Hysteroscopic operative removal of myoma has been advocated as a more efficacious and safe procedure. Recently most hysteroscopic surgeons have preferred to perform myomectomy utilizing Hyskon as the distending medium, because of its lack of miscibility with blood and optical clarity. Although no hysteroscopic method of tubal occlusion can be accepted as practical at present, it seems reasonable to accept that the hysteroscopic approach remains promising.

The future of hysteroscopy is assured. The day is not far off when this procedure will occupy the same pre-eminent position in Gynecology as cystoscopy holds in Urology.

Siegler[18] in 1976 studied 257 cases of AUB with hysteroscopy and reported that 41.7% patients had normal endometrium and 58.3% had abnormal endometrium. **Sciarra**and **Valle**[19] in 1977 reported on 320 cases of AUB and returned with 28.8% normal endometrium and 71.2% abnormal endometrium. **Barbot**[20] in 1980 reported 84% accuracy in his series. **Baggish**[15] in 1979 reported 47.1% normal endometrium and an accuracy of 87.5% in his series of hysteroscopy in AUB.

Valle[21] in 1981 studied 419 pre-menopausal and 134 post-menopausal patients who had abnormal uterine bleeding. Hysteroscopy was performed prior

to D&C. In 352 pts an abnormality on hysteroscopy was detected, such as endometrial polyps, submucousleiomyomas, and intra-uterine adhesions. He concluded that hysteroscopy provides a precise and accurate adjunct to traditional methods of diagnosing intra-uterine abnormalities, particularly focal lesions missed at curettage.

Gimpelson[22] in 1984 studied 66 women who underwent panoramic hysteroscopy prior to D&C. In 51 of these pts, a directed biopsy was performed through the hysteroscope. In 48 cases the results of hysteroscopy and curettage were in agreement. Hysteroscopy revealed more information than curettage in 16 pts, whereas curettage revealed more information than hysteroscopy in only 2 pts.

Wamsteker[23] in 1984 analyzed 199 patients of AUB with hysteroscopy. He used Hyskon as distension medium. In 85 patients (41.5%), no abnormality was seen. 20 pts had atrophic endometrium, intra-uterine tumors were found in 67 cases and endometrial hyperplasia in 25 pts. In his opinion, hysteroscopy is indispensable for the diagnosis of intrauterine tumors in women with AUB. In case there is an intrauterine pathology, histological examination is always necessary to evaluate the hysteroscopic diagnosis.

Gimpelsonand Rappold[24] in 1988 studied a total of 276 women who underwent both hysteroscopy and D&C. In 223 cases the results of hysteroscopy and curettage were in agreement. Hysteroscopy revealed more

information than curettage in 44 pts, whereas curettage revealed more information than hysteroscopy in only 9 pts. When he compared the results of this study with his previous study, there was little doubt that panoramic hysteroscopy is superior to curettage in making an accurate diagnosis of pathologic conditions in the uterine cavity.

Loffer[25] in 1989 evaluated 187 patients with abnormal uterine bleeding. Hysteroscopy was more accurate in 9.1% and less accurate in only 0.5% of patients. The specificity of both techniques was 100%, but the sensitivity of hysteroscopy was greater (98%) than that of D&C (65%). Endometritis was the only condition missed by hysteroscopy. The lesions missed by D&C were uterine fibroids and polyps. Among 91 pts the hysteroscopic view was negative.

Seth[26] in 1990 evaluated the role of hysteroscopy in 51 pts. Abnormal findings were noted in 56% of cases. Intrauterine myomas and polyps were diagnosed with greater accuracy (81.8%) than histological abnormality of the endometrium (71.4% accuracy). The overall accuracy of hysteroscopic findings in abnormal uterine bleeding was 92%. The procedure changed the clinical diagnosis in 21% pts, confirmed it in 66% and either failed or was proven inaccurate in the remaining 13% of cases.

Parasnisand **Parulekar**[27] in 1992, reported on 96 cases of AUB evaluated by both hysteroscopy and D&C. 76% of the patients had normal endometrium. Hysteroscopy diagnosed endometrial polyp and submucous

leiomyoma with 100% accuracy. In 17 cases the results of hysteroscopy and curettage were in agreement. Among the 73 cases with negative hysteroscopic view, an abnormality was detected by tissue sampling in only 2 patients. The accuracy of hysteroscopy (92%) was greater than curettage (76%). He concluded that hysteroscopy may prove to be superior to curettage in making an accurate diagnosis of intra-uterine pathology.

Neumann and **Astudillo**[28] in 1994 compared the results of hysteroscopy and D&C performed in 85 pts. In 47 pts (55.2%) the hysteroscopic diagnosis was normal, in 16 pts (18.8%) was hyperplasia, in 17 pts (20%) was polyp, 4 cases (4.7%) were described as cancer and in 1 case (1.3%) the diagnosis was bone metaplasia. He obtained a correlation of 93%.

Liu and **Zhou**[29] in1995 compared the results of 124 cases of AUB examined with hysteroscopy with pathological findings obtained during curettage. Hysteroscopy and D&C agreed on the diagnosis in 92.7% pts. There were 9 cases misdiagnosed by hysteroscopy and 6 cases had false negative results during curettage. Hysteroscopy is an effective method for identifying the causes of postmenopausal bleeding, which is superior to curettage of uterus.

Naegle[30] in 1996 conducted a comparative observational study to determine the role of out-patient diagnostic hysteroscopy in patients with AUB on HRT and to contrast this with a central group of women presenting with post-menopausal bleeding. He concluded that there was a high incidence of

intra-uterine abnormalities in women with menstrual symptoms while taking HRT, but the pathology differed from those with post-menopausal bleeding. As focal lesions are found commonly in such patients, their detection by diagnostic hysteroscopy should improve compliance with HRT as it will allow individualization of treatment.

Loverro et al[31] in 1996 studied 980 women with abnormal uterine bleeding with hysteroscopy and D&C. Positive predictive value of hysteroscopy in the diagnosis of endometrial hyperplasia was 63%. Sensitivity and specificity of hysteroscopy was 98% and 95% respectively. Negative predictive value was 99%. PPV was higher in postmenopausal women compared to women in the fertile age (72% v/s 58%)

Torrejon et al[32] in 1997 studied 1398 pts of AUB with hysteroscopy and D&C. Endometrial hyperplasia was diagnosed with an accuracy of 92.5% in premenopausal and 97.3% in postmenopausal women. Adenocarcinoma was diagnosed with an accuracy of 99.5% in premenopausal and postmenopausal women.

Panda and **Parulekar**[33] in 1999 studied 66 pts of AUB with hysteroscopy and D&C. They were in the age group of 25-70 years. Abnormal findings were detected in 53.5% of cases. Hyperplasia was the commonest finding. The sensitivity of hysteroscopy was 92.5% and that of D&C was 83.3%. False

negative value of hysteroscopy was very low. The negative predictive value was 93%.

Trotsenburgand **Nagele**[34] in 2000 evaluated the feasibility and diagnostic accuracy of out-patient diagnostic hysteroscopy in pre menopausal patients suffering from AUB. Intra-uterine pathology was diagnostic in 34% patients, the most frequent being submucousmyomas and endometrial polyps. He concluded that diagnostic hysteroscopy is a simple and safe technique, well accepted by majority of patients with an excellent diagnostic accuracy and with a high success rate as an out-patient procedure.

Garutiet al[35] in 2001 conducted a study to estimate the accuracy of hysteroscopy in predicting endometrial histopathology. 1500 women with AUB were studied. Hysteroscopy showed sensitivity, specificity, NPV, and PPV of 94.2%, 88.8%, 96.3%, and 83.1% respectively. Highest accuracy was in diagnosing endometrial polyps, with sensitivity of 95.3%, specificity 95.4%, PPV 98.9% and NPV 81.7%.

Madanand **Al-Jufairi**[36] in 2001 retrospectively studied 556 cases of AUB, who underwent hysteroscopy and D&C. 53, were diagnosed to have endometrial polyps hysteroscopically, however only 13 pts were confirmed to have polyps histologically. Hysteroscopy was highly specific for diagnosis of both endometrial hyperplasia (85%) and endometrial carcinoma (99.5%);

however the sensitivity of hysteroscopy for diagnosing endometrial cancer was 40% and 30% for endometrial hyperplasia.

Clark[37] in 2002 conducted study on the accuracy of hysteroscopy in the diagnosis of endometrial cancer and hyperplasia. They concluded that diagnostic accuracy of hysteroscopy is high for endometrial cancer, but only moderate for endometrial diseases.

Bain[38] in 2002 evaluated and compared the clinical benefit of additional out-patient hysteroscopy over traditional vaginal examination and endometrial biopsy in unselected pre-menopausal women and 370 women were recruited in the study and he concluded that out-patient diagnostic hysteroscopy is an acceptable procedure and may give more reassurances. It does not influence clinical management, especially with respect to hysterectomy rate. Out-patient hysteroscopy may be useful in selected cases, but when performed in a non-selective manner, it has little influence on clinical management and increases costs.

Gianninoto[39] in 2003 conducted a retrospective study of diagnostic hysteroscopy in AUB and concluded that ambulatory hysteroscopy was shown to be a simple, safe, well tolerated and reliable procedure in the diagnosis of AUB across all age-groups and its wide spread use can drastically reduce the need for conventional curettage, thereby increasing patient satisfaction and lowering costs.

deWitand **Vleugels**[40] in 2003 evaluated 1045 hysteroscopies performed over 6 years retrospectively. Normal cavity was found in 54.2%. Most common abnormal findings were fibroids (21%) and endometrial polyps (14.4%). Hysteroscopically diagnosed hyperplasia of the endometrium was confirmed in only less than half the cases. Endometrial carcinoma was suspected on hysteroscopic view in 2 cases of a total of 7 proven cases. Diagnostic hysteroscopy is a valuable tool in diagnosing structural intra-cavital pathology, very suitable for out-patient clinic.

PHYSIOLOGY OF MENSTRUATION

Menstruation is a veryrecent phenomenon intheevolutionary time line. It occurs invery few species. Thediagnosisand management of abnormal menstrualfunctionmust be based on an understanding of the physiologic mechanismsinvolved in the regulation of the normal cycles. Although the activity of the endometrium is directlycontrolled by the ovarianfunction and by the two hormones secreted by the ovary, the ovaryitself is activated by the pituitary gland, the secretion of which is under the nervous control of the hypothalamus.

The normal human menstrual cycle can bedivided into two segments: the ovariancycleand the uterine cycle, basedon the organ under examination. The ovarian cycle may be further divided into follicular and luteal phases, whereasthe uterine cycle is divided into the corresponding proliferative andsecretory phases.

At the beginning of each monthly menstrual cycle, levels of gonadal steroids are low and have been decreasing since the end of the luteal phase of the previous cycle. Withthe demise of the corpusluteum, FSH levels begin to rise and acohort of growing follicles is recruited. These follicles each secreteincreasing levels ofoestrogen as they grow in the follicular phase. Thisin turn, is the stimulus for uterine endometrial proliferation.

Rising oestrogenlevels provide a negative feedback on pituitary FSH secretion which begins to wane by the midpoint of the follicular phase. Conversely, LH initially decreases in response to rising estradiol levels but late in the follicular phase the LH level is increased dramatically (biphasic response). At the end of the follicularphase (just prior to ovulation), FSH inducedLH receptors are present ongranulosa cells andwith LH stimulation,modulate the release of Progesterone.

After a sufficient degree of oestrogenic stimulation, the pituitary LH surge is triggered, which is the proximate cause of ovulation which occurs 24-36 hours later. Ovulation heralds the transition to luteal secretory phase. The oestrogen level decreases through the early luteal phase from just before ovulation until the midluteal phase when it begins to rise again as a result of corpus luteumsecretion. Progesterone levels rise precipitously after ovulation and can be used as a presumptive sign that ovulation has occurred . Both oestrogen and progesterone levels remain elevated throughout the life

of the corpus luteum and then wane with its demise, thereby setting the stage for the next cycle.

In the absence of implantation, glandular secretion ceases and an irregular breakdown of the decidua functionalisoccurs. The result is a shedding of this layer of the endometrium , a process termed menses.

A normal menstrual cycle lasts from 21 to 35 days with 2 to6 days of flow and an average blood loss of 20-60ml.However studies of large numbers ofwomen with normal menstrual cycles haveshown that only approximately two- thirds of adult women have cycles lasting 21-35 days . The extremes of reproductive life arecharacterizedby a higher percentageofanovulatory or irregularly timed cycles .

ABNORMAL UTERINE BLEEDING

Abnormal uterinebleeding is a common clinical problem with myriad of causes. A solid knowledge of menstrual physiology and athorough approach to differential diagnosis can assist the gynaecologistevaluate and manage the problem with confidence.

Terminology Used to Describe Abnormal Uterine Bleeding[52]

Menorrhagia : Prolonged or excessive bleeding at regular intervals.

Metrorrhagia : A period of menstrual bleeding longer than 7 days or interval bleeding.

Menometrorrhagia : Prolonged or excessive bleeding at irregular intervals.

Polymenorrhoea : Regular bleeding at intervals of less than 21 days. .

Oligomenorrhoea : Bleeding at intervals greater than every 37 days.

Amenorrhoea :absence of menstruation for at least 6 months.

Intermenstrual : bleeding between regular cycles.

Post menopausal bleeding : bleeding occurring more than 12 months after the last menstrual period of a menopausal women.

EVALUATION OF AUB

History taking:

The specifics of the bleeding pattern should be elicited on history taking. The frequency, duration, and severity of flow should be ascertained. It is also critical to determine if the bleeding is acyclic or cyclic, the latter being more consistent with ovulation. Other important considerations include patient age, sexual history (which determines risk for sexually transmitted diseases), previous gynecologic disease, likelihood of pregnancy, use of medications or hormonal contraceptives, and the presence of chronic medical problems[1].

Physical Examination:

Evidence of systemic disease should be sought on physical examination. Signs and symptoms of hypothyroidism, liver disease, hyperprolactinemia, eating disorders, and coagulopathies warrant special attention. A thorough pelvic examination, including a Pap smear, is essential. If indicated by history or physical findings, cervical cultures

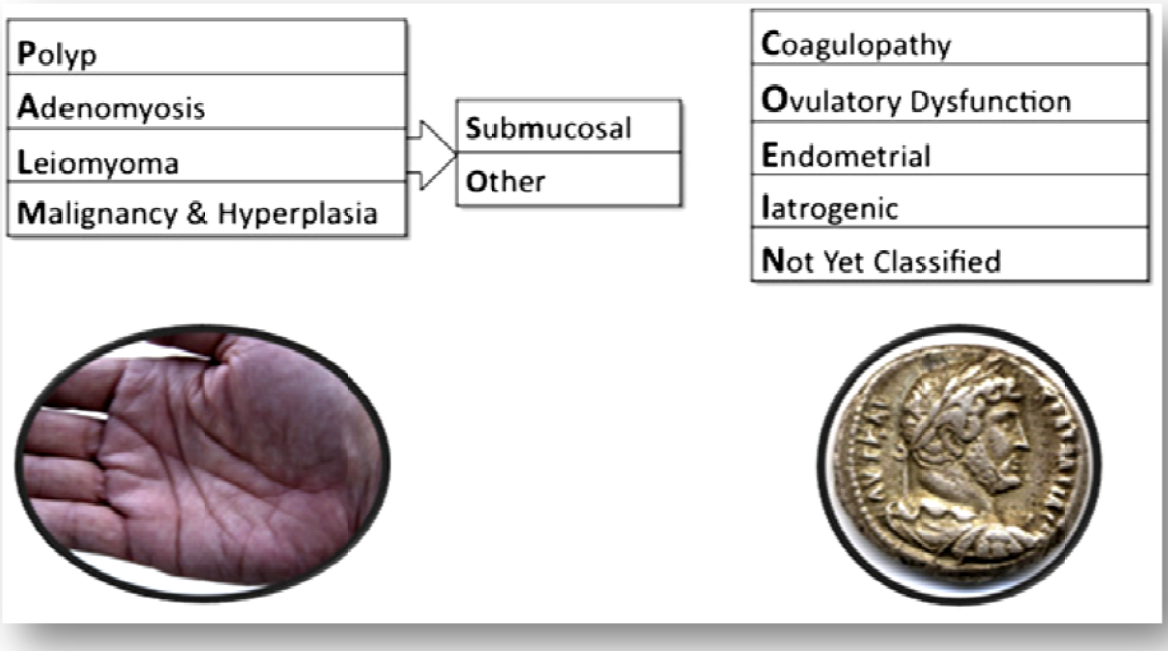
for Neisseria gonorrhea and Chlamydia trachomatis should be obtained[1].

Diagnostic testing:

In most cases, laboratory evaluation is limited to a complete blood cell count. However, all women of reproductive age who have abnormal uterine bleeding should have a urine or serum pregnancy test. Other tests are done only if indicated by the results of history taking and physical examination[1].

Further investigation of abnormal uterine bleeding is guided primarily by the patient's age. Adolescents who arenot sexually activedo not require additional workup. In this group, if a cause was notuncovered during the evaluation described earlier, a diagnosis of dysfunctional uterine bleeding isassumed .

PALM-COEIN CLASSIFICATION OF CAUSES OF AUB



- **FIGO** Menstrual Disorders Group **(FMDG)**
- Stratified into 9 basic categories acc. to the acronym

Anovulatory Bleeding[56]:

Anovulation is themost common cause of DUB in reproductive-age women and is especially common in adolescents. Upto 80 percent of menstrual cycles areanovulatory in the first year after menarche. Cycles become ovulatoryon an average of 20 months after menarche. If anovulatory bleeding is notheavy or prolonged, no treatmentis necessary. If the adolescent is distressed by the irregularity of her menses or has beenanovulatory for more than a year, oral contraceptive pills are the treatment of choice[55].

. All causes of anovulation represent a progesterone-deficient state. Treatment options include exogenous progesterone everythree months to protect against endometrial cancer, oral contraceptives or, if pregnancy is desired, ovulation induction with clomiphene.

Ovulatory Dysfunctional Bleeding:

Although less common than anovulatory bleeding, ovulatory DUB may also occur. DUB in women with ovulatory cycles occurs as regular, cyclic bleeding. Menorrhagia may signify a bleeding disorder or a structural lesion, such as uterine leiomyomas, adenomyosisor endometrial polyps. Up to 20 percent of adolescents who present with menorrhagia have a bleedingdisorder such as vonWillebrand's disease. Liver disease with resultant coagulation abnormalities and chronic renal failure may also cause menorrhagia.

Characteristics of Ovulatory and Anovulatorycycles[55] :

Ovulatory cycles	**Anovulatory cycles**
1. Regular cycle length	1. Unpredictable cycle length
2. Presence of premenstrual symptoms	2. Unpredictable bleeding pattern
3. dysmenorrhoea	3. Frequent spotting
4. Breast tenderness	4. Infrequent heavy bleeding
5. Change in cervical mucus	5. Monophasic temperature curve
6. Mittleschmertz	
7. Biphasic temperature curve	

PERIMENOPAUSAL WOMEN

As women approach menopause, cycles shorten and often become intermittentlyanovulatory. These changes are the result of a decline in the number of ovarian follicles and in theestradiol level. Asfolliclesdecrease in number, the level of follicle-stimulating hormoneneeded to stimulate ovulation increases.

Excluding Endometrial Carcinoma[56]:

Allperimenopausal women with persistent abnormal uterinebleeding should be evaluated for the presenceof endometrialhyperplasia or carcinoma. Endometrial biopsy is the most widely used and best studied method of excluding endometrial carcinoma in this age group. Inwomen with normalfindings on biopsy, treatment usually consists of monthly progesterone

withdrawal or low-dose oral contraceptives. If bleeding continues despite hormonal therapy, further investigation is warranted

POSTMENOPAUSAL WOMEN

The most serious concern in postmenopausal women with abnormal uterine bleeding is endometrial carcinoma. Of all postmenopausal women with bleeding, 5 to 10 percent are found to have endometrial carcinoma. Other potential causes of bleeding are cervical cancer, cervicitis, atrophic vaginitis, endometrial atrophy, submucous fibroids, endometrial hyperplasia and endometrial polyps[56].

Hormone Replacement Therapy:

Women receiving hormone replacement therapy often presents withabnormal bleeding and, ofthese, 30 percent have uterine pathology. Other causes includecervical lesions, vaginal pathology or the hormone therapy itself. Women receiving sequentialhormone replacement therapy may experiencemidcyclebreakthrough bleed resulting from missed pills, medication interactions ormalabsorption. If unscheduledbleeding occurs in two or more cycles, further evaluation is indicated[56].

Treatment options for Dysfunctional Uterine Bleeding[54]

Premenopausal:

- Oral contraceptives: Low dose (35mcg) monophasic ortriphasic oral contraceptives can regulate cycles while providing contraception.

- Medroxyprogesterone: (10mg/dayfor 10 days) If contraception is not an issue, it can be used to regulate cycles. In a woman who hasamenorrhoeaoroligomenorrhoea,medroxyprogesterone every 3 months can protect against endometrial hyperplasia.
- Clomiphene: (50-150mg/day on days 5 to 9) can induce ovulation in a woman who desires pregnancy.

Perimenopausal:

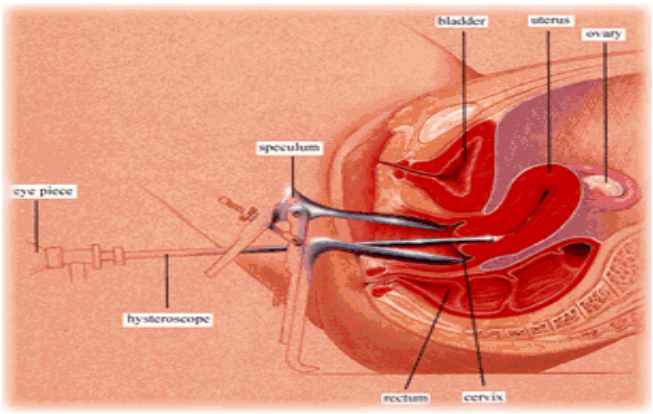
- Medroxyprogesterone: (10 mg per day for 10 days) May use monthly to regulate bleeding patterns.
- Oral contraceptives :(20-µg) Can continue oral contraceptives until a woman has finished menopause and then change to HRT. (May be a relative contraindication in women>35 years of age and who smoke)

Postmenopausal (receiving HRT):

- Cyclic HRT: Consider increasing the progesterone dose if early withdrawal bleeding occurs. Increase the oestrogendose if intermenstrualbleeding is present.
- Continuous combined HRT: May increase theoestrogendose for 1 to 3 months to stabilize the endometrium. May also try increasing the progesterone dose. If bleeding continues, consider changing regimen tocyclic HRT or using a different type of oestrogen.

HYSTEROSCOPE

The term “hysteroscopy” is derived from the fusion of two ancientgreek words“histeros” (uterus) and “scopeo” (to see) and refers to the “direct visual examination ofuterine cavity”.Indeed hysteroscopy is a procedure in which an illuminated scope called“hysteroscope”is inserted through the cervix into the uterine cavity that has beendistended by a fluidor gas distensionmedium, in order to diagnose or eventually treat uterine abnormalities. Goodvisualization is the keyto a correctdiagnosis and aprecisetreatment. The five essential elements for an optimal visualization include**:**Monitor,Endocamera, Light source, Lightcable



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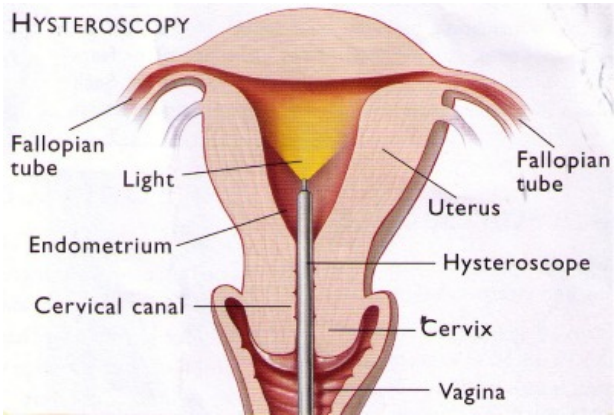


ENDOCAMERA

In modern hysteroscopy the human eye has been replaced by the endocamera (**Fig. 1)**. Several types of endocamera are available, each differing from the other in three main characteristics:

- Sensibility
- Resolution
- Definition

Sensibility, measured in lux, represents the minimal quantity of light necessary to make captable an image; resolution represents the number of vertical lines which constitute the image, which can be detected on the screen; picture definition is proportional to the number of picture elements, called pixels, produced by the chip. The chip is a microprocessor also called Charged Coupled Device (CCD) because it transformsthe real image into an electronic signal. The image captured by the endocamera is splitinto the three maincolours: red, green andblue, which are send either to one or to three different chips, one for each colour. Obviously, the higher the number of chips, the better is the chromatic accuracy of the image .

LIGHT SOURCE :

In 1960 Karl Storz discovered that it was possible to transmit light from a light source outside the body via a light cable through an endoscope to the examination site. This discovery markedthe birth of "cold light endoscopy" . During the last 40 yearsseveral types of light sources each one morepowerful than the other have been developed inorder to provide a clear vision inside the uterinecavity which is characterized by a high absorption oflight, because of the predominance of redcolour.

At present xenon light sources are preferred to the halogen ones forseveral reasons:

- Produce twice the light output as a modern halogen lamp
- Provide white light, which is ideal for endoscopy
- The light intensity is uniform while lamp lasts
- Have a longer duration (nearly 500 hours)
- And a realer colour temperature (6000 K) which results in better colour chromatic performance

A 175 watt xenon light source gives good depth of field, enough to perform an adequate office operative hysteroscopy. A light source of 300W is recommended for video recording.

LIGHT CABLE :

Two types of cables cantransmit thecold lightfrom the light source to the endoscope. Thetransmissionoflight through a glass fiber cable depends on

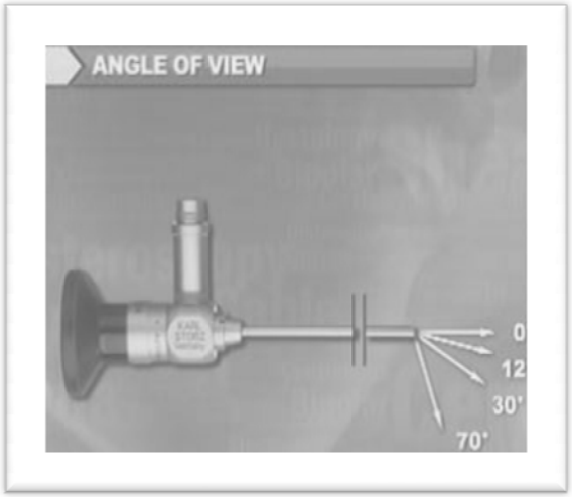
thephenomenon of total internal reflection. If a fiber isstraight or curved, light entering one end travels in azig-zag path, repeatedly reflecting off the internalsurface of the fiber until it emerges from the otherend, with the same angle of incidence of the entrance .

These glass fibers are rather vulnerable: damage or rupture of these fibers caused by forced bending will immediately reduce the light intensity. Theliquid crystal cables are made of a fluid medium, typically colesteric saline. These cables transmit a higher light intensity for a similar power of light emission, in comparison with optical fiber cables. Despite their higher rigidity, which may often hamper the endoscopic procedures, it has the distinctive advantage of duration.

OPTICS :

An endoscope is an optical instrument permitting visual and photographic examination of the body cavities and internal organs that are inaccessible for direct viewing. Basically an endoscope consists of an optical system to carry light in order to illuminate the object being viewed and either the same (as in contact hysteroscope) or generally different optical mechanism for conveying the image back to the eye or camera. The image may be conveyed through a series of lenses in which case the endoscope tube is rigid or it may be carried to the viewer by means of light trapped

in a flexible fibre optic bundle. In most modern endoscopes the illuminating light is carried to the object by an optical fibre bundle .



HYSTEROSCOPES :

Rigid telescopes are available either with 0, 12, 30 or 70 degree viewing angles . Selection of these angles is mostly a matter of personal preference. For the beginners, the 0-degree telescope is much easier to use because orientation is similar to that of normal vision. The view through the fore-oblique view scopes (typical of all the modern

Hopkins lens-scope based hysteroscopes), once the tip of the scope is placed 1-1.5cm from the fundus, permits a rapid and easy evaluation of all the uterine walls, the corneal recesses and tubal ostia by simply by simply rotating the telescope slightly on its axis to the right or left. On the contrary, the same view with a 0 degreescope is possible only byangulating thewhole instrument to theleftorright bylateral movements thus determining amajorstretching ofcervicalmyometrial fiberswhich is mostly responsible for patient's discomfort . In the early 90s, together with the development of rigid hysteroscopes, improvements in fiberoptic technology allowed manufacturers to create 0-degree flexible hysteroscopes characterized by a smaller diameter thus less invasiveness in comparison with the rigid ones.

1. CONVENTIONAL PANORAMIC HYSTEROSCOPE [41]

This is the most widely used method. The principle is simple involving visualization by means of a telescope of the uterine cavity using a liquid or a gaseous medium for distension. It has the following parts

SHEATH:

Before entering the uterine cavity, the telescope must be fitted to a sheath through which distending medium is infused. To provide reasonable clearance for 4mm telescope, the diagnostic sheath measures 5mm in outer diameter. Entry into the interior cavity of the sheath is provided with single stopcock with a leur-lock fitting. The terminus

of endoscope should be flush with the sheath. It is made up of stainless steel and is sterilized like an obturator. It is 27cm long. The sleeve has an inlet and outlet for liquid medium which is used to distend the uterine cavity. There is also a channel for operating instruments near proximal end. The sleeve forms a channel for the passage of the panoramic hysteroscope. A cylindrical collar is present on the shaft. It can be slided forward and backward and can be fixed in any desired position by means of a screw. The distal part of the sleeve is graduated in centimeters. Position of the collar is determined by utero-cervical length.

HYSTEROSCOPE:

The optics of the telescope and the fibre optic lighting system is as in a laparoscope. Usually there is a 30 degree fore oblique lens which permits visualization of tubal ostia and the lateral uterine walls more easily. The telescope has 3 parts the eye piece, the barrel and the objective lens.

CERVICAL CAP:

It is made up of stainless steel and is 7.5cm long. Its one end is cup shaped. The cavity of the cup communicates with a tube which runs parallel to and in contact with the shaft of the instrument. A two way valve can be used to close off the lumen of the tubing. The inner diameter of the instrument is such that the

hysteroscope sleeve just fits in its cervical cap and prevents leakage of the distending medium.

2. CONTACT HYSTEROSCOPE :

It is a type of rigid endoscope and among all modern hysteroscopes only the contact hysteroscope requires neither a sheath nor a distending medium, available just for diagnostic purposes. Theprinciple in this method is the objective lens is kept in contact with the structure under going scrutiny.

It has a rod lens, objective eye piece that is adjusted for sharp focus on an object at the distal surface of the lens. It measures 200mm in length and 6-8mm in width. Objects to be viewed are in clearest focus when in actual contact with the end of hysteroscope. One significant advantage of the contact hysteroscope is it squeezes blood and tissue fluids away from the object to be viewed, providing a clear image. There is very little distortion of the image because the angles of entry and exit of the light rays are identical and the rays are transmitted through the same channel.

MICROHYSTEROSCOPE :

It is the most sophisticated and is the latest technique. It measures 250mm in length and 4mm in diameter with wide (90°) field of vision. The distal lens is sharply angulated to facilitate atraumatic penetration of cervical canal. Double ocular setup

includes push button selections for panoramic or contact mode as well as for various magnifications[1].

Four magnifications x1, x20, x60 and xl50 are described by **Hamou**. The x1 magnification selection is similar to panoramic view offered by conventional hysteroscope. At x20 magnification the image is similar to that seen in colposcope with appreciation of glandular and vascular structures being possible. At x60 with light contact with mucosa, previous staining will aid examination of glandular abnormalities. With direct contact at x150 magnification, nucleocytoplasmic examination of cervical cells is possible. The entire sheath for diagnostic purpose is 5.2mm and contains 4mm endoscope and channel for distending medium. An operating sheath witha maximumdiameterof 6.5mm is available with a 14mm channel for introducing flexible instrumentssuch as biopsy forceps,electroprobes, catheterandintratubal devices.

4. PORTABLE OUT-PATIENT HYSTEROSCOPES

The Yan De Pas Hysteroscope:

Yan de pas (1983) system was designed for single handed outpatient use and consists of a portio-adaptor and 4mm telescope with a 30° angle of vision and 70° field of vision. The unique feature of the instrument is sliding mechanism operated by the surgeon single handedly which enables the telescope to be advanced slowly and

safely into uterine cavity for a maximum of 7cm, therefore reducing chances of perforating fundus.

The Parent self contained out-patient system:

This hysteroscope consists of a 4mm lumina telescope in a sheath held by a completely self contained unit which provides both illumination and gas for distending the uterine cavity. Gaseous distension is provided by a replaceable cartridge of CO_2 gas at a maximum flow rate of 100 ml/min. The gas enters the uterus from a hole in the sheath near the tip of the telescope. Each cartridge contains 4 litres of gas under pressure which allows about 10 hysteroscopies or a flow of about 1 hour 20mts at a flow rate of 50ml/min. Illumination is provided by 3 rechargeable batteries placed in the handle of the unit. This light source is adequate for panoramic hysteroscopy. It is not bright enough for photography. Advantage of theparent system is that it is completely self contained and portable.

SPECIALISED HYSTEROSCOPES

The Flexible Hysteroscope:

All hysteroscopes so far considered are rigid. Flexible hysteroscopes are being developed and may provide some advantages. The flexible instrument is a modified choledochoscope that is 6mm in diameter. The telescope with its channel for gas or fluid insufflation is introduced through the cervix after minimal dilatation

and the tip can be angled through 180° by a wheel on the proximal end. Although the view is grainier than a rigid telescope because of large number of fibres, the view especially at cornua is better than that provided by conventional hysteroscopy and this is an advantage for the insertion of intratubal devices for tubal sterilization.

The Hysteroser:

It has a unique telescope consisting of a rod of optic glass which ends in a concave mirror. An ingenious and unique device of mirrors and diaphragms that traps and concentrates ambient light so that no external light source is required for illumination being provided by day light or reflected light from theatre lamp. This makes the unit completely portable. It can be only used as contact hysteroscope.

RIGID CONTINUOUS FLOW HYSTEROSCOPES :

One of the most commonly used rigid hysteroscopes is the Continuous Flow Hysteroscope "size 5" developed by Storz, based on a 2.9 mm rod lens system with 30-degree foreoblique view, and an outer diameter corresponding to 5.0 mm. Recently, a thinner version has been developedbasedon a revolutionary2.0 mm rodlens system scope that reduces the final diameter of thehysteroscope to 4.0 mm.

DISTENSION MEDIA :

Theuseof mediais critical forpanoramic inspectionof the uterine cavity. Without media, the uterus is a narrow slit. Intrauterine pressures needed toadequately view the endometrium are proportional tothe muscle tone and thickness of the uterus. A pressure of 75 mm Hg isadequate for uterine distention. Rarely ismore than100 mm Hg required, and higher pressures can result in increased risk ofintravasationof media. The refractiveindex ofeach medium option affects magnification and visualization of the endometrium.

Media leakage can occur throughthe cervix, tubal ostia,hysteroscopic channels, anduterine vessels. An inner sheath can be used for inflow of media witha larger outer sheath, whichcan have perforations to allow for outflowof media in order to keep the visual field clear . Thedelivery system can be via closed or open system, with the former using fluid returned through a pump to areservoir and the latter allowing free flow of the media out through the cervix into a collection bag for volume monitoring. For clearer visibility, an optional

active suction can be placed at the outflow to clear debris from the field when needed.

Different kinds of deliverysystems are suited tothe various types of media. The simplest isasyringe that most oftenis used with the high-viscosity dextran 70. A hanging gravity-fed container that can be raisedor compressed with a cuff can be unreliable for pressures. Pumps are available that monitor pressure and volume for low-viscosity media.

GASES :

Carbon dioxide has been used since 1920, when it was added by Rubin during tubal perflation . The refractory index of carbon dioxide is 1.0, which allows for excellent clarity. Carbon dioxide is primarilyemployed for diagnostic hysteroscopy. Carbon dioxide is

rapidly absorbed and easily cleared from the body via respirations; it allows a wider field of view at lower magnification. A smallscope can accommodate the gas because the gas can flow through narrow operative channels, making anesthesia and cervical dilation unnecessary. However, carbon dioxide does require an insufflator specific for hysteroscopy to regulate flow and limit maximal desired intrauterine pressure. Note that laparoscopic insufflatorsare not safe.

Usually, a flow rate to 40-60 mL/min at a maximum pressure of 100 mm Hg is accepted as safe. Higher pressures and rates can result in cardiac arrhythmias and arrest . The advantages of carbon dioxide are its relatively low toxicity profile, rapid absorption, and lack of destruction to instruments. Its disadvantages are the inability to clear the lens when bleeding occurs, resulting in loss of a clear visual field and limited visualization, and the risk of embolization with exposed blood vessels.

FLUIDS :

The advantage of fluid over gas is the symmetric distention of the uterus with fluid, as well as its capacity to flush blood, mucus, bubbles, and small tissue fragments more effectively out of the visual field. Both low-viscosity and high-viscosity fluid media can be used for distention.

Low-viscosity fluid

Two types of electrolyte-containing fluids exist, sodium chloride (0.9% sodium chloride, which is 154 mEq/L of sodium and chloride) and acetated Ringer solution. These solutions can be usedfor diagnostic hysteroscopy as well as for limited operative procedures. Operative procedures using mechanical, laser, or bipolar energy are safe. Both options are readily available, and complex equipment is not needed. Two major disadvantages are associated with these solutions. They are miscible withblood, obscuring visibility with bleeding and thus requiring larger volumes to clear the operative field, and they are excellent conductors, which precludes proceduresthat useelectrosurgery. Note that new equipmenthas been developed that allows for surgical procedures in the setting of these solutions,ie, VersaPoint, ERA sleeve, and the OPERA STAR system. The nonelectrolyte fluids consist of 5% mannitol, 3% sorbitol, and 1.5% glycine. These fluids do not conduct electrical current and allow for better visualization when bleeding occurs.

The common disadvantage of all of the nonelectrolyte media istheir risk of overload from intravascular absorption (particularly >2 L), which requires fluid monitoring during use. All of these fluids areisotonic solutions that can be applied for diagnostic as well as operative hysteroscopy. However, 5% mannitol can be used only with monopolaroperative procedures. It is broken down by the liver to glycogen and excreted through the kidney, with a half-life of 100 minutes (Marlow, 1995).

If 5%mannitolis administered intravenously, it remains in theextracellular compartment. Whenintravasation occurs with this media, fluid and electrolyte imbalances can result in pulmonary edema, which can be treated with a diuretic. The 3% sorbitol is broken down bythe liverto fructose and glucose, which increases postoperative risks of hyponatremiaand hyperglycemia. Adilutionalhyponatremia also can occur with fluid overload .Use caution when this is used in a patient with impaired hepatic function because glycine is metabolized to ammonia and serine .

High-viscosity fluid :

The only high-viscosity medium available is dextran 70 or Hyskon, which is 32% dextran 70 in 10% dextrose in water. Dextran is a high–molecular weight substance of 70,000 d. It is a nonelectrolytic, nonconductive fluid that can be applied in operative and diagnostic procedures. Because of its high viscosity, dextran 70 is immiscible with blood and has minimal leakage through the cervix and tubes, allowing for excellent visibility during surgical procedures.

However, avoid more than 500 mL of absorption to prevent fluid overload because it is a volume expander with a high risk of pulmonary edema. With each 100 mL of dextran 70 absorbed, the intravascular volume is increased by 800 mL. This medium has a large adverse effect profile, including allergic reactions and anaphylaxis, fluid overload, disseminated intravascular coagulopathy, and destruction of

instruments(which must be cleaned shortly after use because thesolution can stick to the equipment).

INDICATIONS FOR HYSTEROSCOPY :

1. Evaluation of unexplained abnormal uterine bleeding in pre-menopausal or post-menopausal patients.

2. Diagnosis and trans-cervical hysteroscopic removal of suspected sub mucous leiomyoma or endometrial polyp.

3. Location and retrieval of 'lost' IUD or other foreign body

4. Evaluation of primary and secondary infertility including confirmation of abnormal hysterogram

5. Diagnosis and surgical treatment of intra-uterine adhesions.

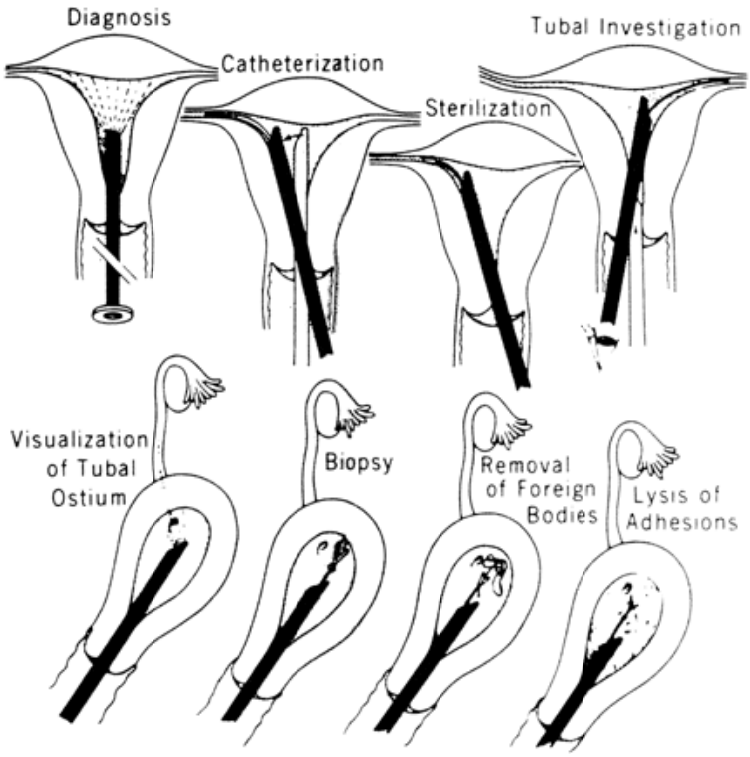
6. Exploration of endo-cervical canal, internal cervical os and uterine cavity in patients with repeated miscarriages.

7.Diagnosis of uterine anomalies .

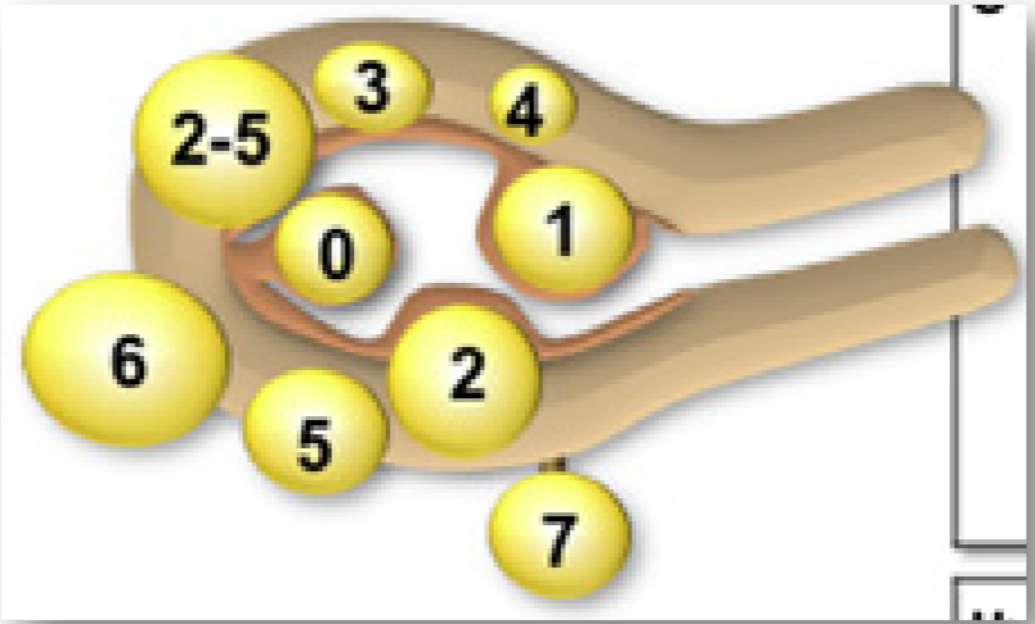
8. Evaluation of patients with failed first-trimester elective abortions.

9. Trans-cervical division of small uterine septae.

10. Assessment of uterine wall defects following surgical procedure such as: myomectomy, caesarean section and hysterotomy.



LEIOMYOMA CLASSIFICATION



0	PedunculatedIntracavitary
1	<50% Intramural
2	>/=50% Intramural
3	Contacts endometrium; 100% Intramural
4	Intramural
5	Subserosal>/=50% Intramural
6	Subserosal<50% Intramural
7	SubserosalPedunculated
8	Other (specify e.g. Cervical, parasitic)
Two numbers are listed separated with hyphen. By convention, 1st is relation with endometrium and 2nd with serosa. 1 example is below-	
2-5	Submucosal&subserosal, each with < 1/2 the diameter in the endometrial & peritoneal cavities.

CONTRA-INDICATIONS FOR HYSTEROSCOPY :

ABSOLUTE:

1. Recent or existing uterine infection: Cervical or uterine infection must be ruled out prior to hysteroscopy. Patients with recent uterine or adnexal infection should not undergo the procedure which could exacerbate an infection
2. Pregnancy: Hysteroscopy should not be undertaken in pregnant patients who desire to continue pregnancy, unless the value of information gained outweighs the potential dangers of infection or pregnancy interruption.
3. Profuse uterine bleeding: In patients with excessive uterine bleeding hysteroscopy cannot be performed satisfactorily regardless of the distension medium used.
4. . Cervical malignancy: Because of the possibility of spreading the disease due to cervical manipulation, patients with known carcinoma cervix should be excluded.

RELATIVE:

1. Adenocarcinoma of endometrium, when the operator is not familiar with this disease
2. Marked cervical stenosis
3. Operator unfamiliarity with instrumentation and technique

COMPLICATIONS OF HYSTEROSCOPY

Adverse effects resulting fromdiagnostic hysteroscopy are few compared to thosefollowing its therapeutic use. Faulty technique and selection ofinappropriate patients are most frequentcauses of untoward sequelae.

1)TRAUMA :

Cervical laceration can result from rough manipulation by holding the cervix with tenacula.

Forceful dilatation provokes unnecessary bleeding. Uterine perforation and thermo intestinal accidentscan occur.

2) **INTRAVASATION :**

Endometrial tuberculosis, sub mucous tumors, hypo plastic uterus and proximal tubal obstructionarepredisposing factors to venous intravasation. The risk of pulmonary embolism is very minimal.

3) **INFECTION :**

Hysteroscopic procedure can exacerbate latent salpingitis. Post-operativesalpingitis, peritonitis and febrile reactions can occur.

4) **MORTALITY :**

Due to faulty technique of co2 insufflation.It is a very rare complication .

TECHNIQUE OF HYSTEROSCOPY :

Under suitable anaesthesia, patient is put in lithotomy position. After catheterizing the bladder, per-speculum and per-vaginal examination is done. Then hysteroscope is introduced into the cervical canal under vision. The cervical canal is examined and thehysteroscope is introduced into the uterus. The tubal ostia are visualized. The endometrial pattern is studied.

ANAESTHESIA :

Anaesthesiais optional .Generalanaesthesia, Paracervical block and Systemic analgesia are commonly used.

1. Paracervical block:

It isused for patients not requiring additional surgical intervention.

Concomitant analgesiamay be required in some cases but often is not necessary.

2. General anaesthesia:

It is themethod of choice when additional surgical procedures are planned such as laparoscopy .

3. Systemic Analgesia:

It may be sufficient for diagnostic purposes when smaller instruments are used. This is particularly true in multiparous patients in whom cervical dilatation may not be necessary.

ENDOMETRIAL STUDY BY HYSTEROSCOPE:

In describing different morphologies 5 well defined criteria are considered:

1) The surface may be smooth (or) rough.

2) The height is constant in normal cases and decreases as nearing the isthmus and ostia.

3) The macroscopic details of the glandular opening.

4) The endometrial vessels.

5) Tubal ostia — the normal ostia are smooth and straight with some parallel mucosal folds.

Proliferative Endometrium:

- The surface is smooth and the colour is white or yellow.
- Height of the endometrium is 2-5 mm.
- Pores of endometrial glands are seen and are situated regularly
- Superficial vascularization forms are relatively poor and are seen as interrupted and punctate lines.
- Tubal ostia are normal.

Secretory Endometrium:

- The surface is smooth or slightly rough. The colour varies from yellow to orange .
- Height of the endometrium is 5mm-7mm.
- Superficial vessels have typical geometrical pattern mimicking a net.
- Tubal ostia are normal.

Natural Atrophy:

- Surface is smooth and appears as white or yellow.
- Height of the endometrium is less than 1mm.
- Visible glandular openings are absent.
- There is complete absence of superficial vessels though deeper vessels of stroma can be seen .
- The tubalostia are either completely obliterated or seen as fibrous folds.

Induced Atrophy:

- The surface is rough and the colour is ochre .
- Height is 1mm-2mm.
- Visible glandular pores are absent.
- Superficial vessels are inadequate but deeper stromal vessels are seen.
- Tubal ostia show characteristic atrophy.

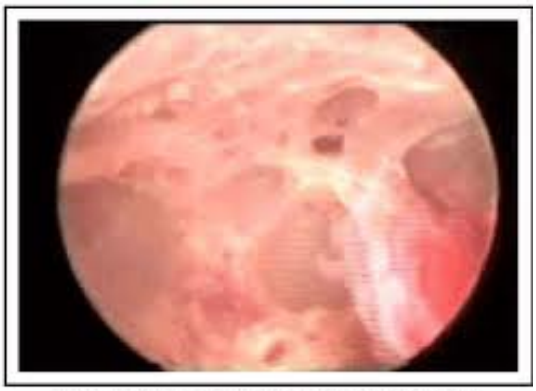
Hyperplasia (Simple), Adenomatous hyperplasia and Carcinoma In-Situ:

- Through micro hysteroscopy this cannot be differentiated although the history varies.
- The surface and colour are variable (white, yellow or even pink)
- Theendometrial height is quite uneven correlated with pseudopolypoid aspect and very thick.
- Rich superficialvascularization is observed with no specific pattern. The endoscopicexamination easily provokes hemorrhage.

- Some glandular orifices can be seen. They are no longer well delineated and the regular disposition has been lost.
- Tubal ostia are normal.

Cystic hyperplasia:

- Surface endometrial height and tubalostia features are identical with hyperplasia.
- Rich superficialvascularisationwith the appearance of network is observed, but thepattern is unequal in size.
- Trapped in the meshes of the "net" are several transparent cysts, which of often attain a diameter of several mm. Some are filledwith a brown liquid suggestive of intra-cystic hemorrhage.



Case-1: simple cystic hyperplasia.

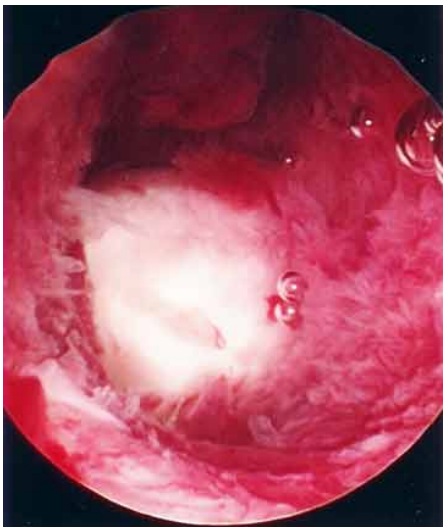
Pseudo Decidualisation:

- The surface is rough.
- Height ofthe endometrium is variable and has pseudo polypoidal appearance.
- Rich congestivevascularization is noted as seen in secretory phase.

- Visible glandular pores are absent.
- Tubal ostia are normal.

Polyps, Myomas and Carcinoma:

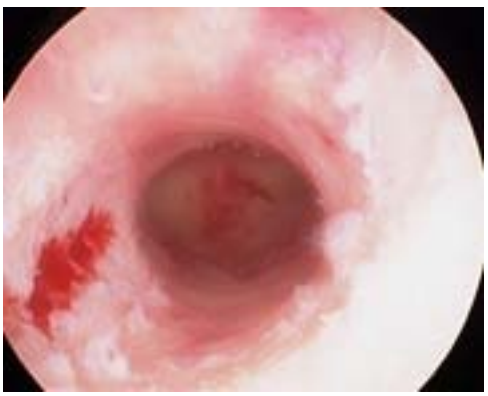
- Benign endometrial polyps are seen as smooth discrete, shiny& vascular.
- Sub mucous fibroids appearsmooth andpaler than the rest of the endometrium.



SUBMUCOUS MYOMA

- Endometrial carcinoma appearsas irregular lesion, vascularization with surface ulceration and bleeding.

Cervix:



CERVICAL CANAL

- Cervical canal is seen as circular or oval with a smaller diameterantero posteriorly.
- It has a smooth mucous membrane with a whitish appearance different from the lining of the uterus.
- Endocervical arborvitae is seen with high magnification

MATERIALS AND METHODS

SOURCE OF DATA:

The present study "A CLINICAL STUDY OF DIAGNOSTIC HYSTEROSCOPY IN ABNORMAL UTERINE BLEEDING AND ITS HISTOPATHOLOGICAL CORRELATION" is a prospective study, which has been carried out in the Department of Obstetrics and Gynecology, Tirunelveli medical college hospital, Tirunelveli , Tamilnadu.

The material for the present study was collected from patients who attended and were admitted in department of Obstetrics and Gynecology with Abnormal Uterine Bleeding. 50 cases of AUB were taken up for the study. All the patients in this study underwent hysteroscopy followed byDilatation and Curettage and the curettings were sent for Histopathology analysis.

The period of the study was from January 2011to October 2011 .The results of Hysteroscopy and Endometrial Histopathology were studied and analyzed. The analyzed data was compared with other series in literatureand discussed. Amaster chart dealing with all aspects has been designed and presented. All patients were well informed about the study in all aspects and informed written consent was obtained.

METHOD OF COLLECTION OF DATA:

Inclusion criteria:

1. Patientwith age between 20-60 yrs with Abnormal Uterine bleeding.
2. Multiparous and nulliparous women.
3. Patients who do not require any emergency management .

Exclusion criteria:

1. Patients with severe anemia due to menorrhagia were excluded since they required immediate intensive care.
2. Patients with profuse bleeding.
3. Cases with large or multiple fibroids.
4. Infection in the genital tract.
5. Malignancies of the genital tract

Caseswere selected by diagnosis on History, General Examination, Abdomen and Pelvic Examination and Routine investigations. Proforma specially made for the study was used. Patients were advised to have alight dinner before 10pm on the night prior to hysteroscopy.Bowel preparation and pre operative antibiotics were given.

Laboratory investigations:

Blood grouping and typing, BT, CT,

Blood urea, Serum creatinine, RBS, ECG, HIV, HBsAg.

Ultrasonography .

INTERVENTIONS INCLUDED:

1**. Anaesthesia**: In this study, hysteroscopy was performed under IV anaesthesia.

Drugs used: Ketamine: 2mg/Kg body wt,Midazolam ,Pentazocine.

Diazepam: 10mg and Atropine: 0.6 mg

2. Hysteroscopy:

Hysteroscope:

This instrument is a modified cystoscope consisting of a stainless steel sheath equipped with stop cock, controlled channels for distension medium and the passage of ancillary instruments. An obturator to facilitate introduction of the sheath is a feature of the hysteroscope. Telescope used was of 4mm 30 degrees fore-oblique lens with a 5mm sheath. Illumination provided by a standard 150W bulb and is transmitted by a fibre optic cable.

Instruments:

- Speculum, Vulsellum, Sponge holding forceps
- D&C set with Dilators
- Syringes and needles

Distension medium used was Normal Saline (0.9%)

Procedure:

Under anaesthesia, aftercatheterising the bladder, a bimanual pelvic examination was done. After introducingSim'sspeculum, the anterior lipofthe cervix was held with vulsellum. After measuring the length of the uterine cavity, the internaloswas dilated ,the hysteroscope was introduced into the cervical canal under vision. The uterine cavity was distended 0.9% normal saline and examined.

The following points were noted:

1. The nature of surface and colour of endometrium
2. The glandular openings.
3. The vascular pattern.
4. The tubal ostia.
5. Any other abnormalities.

Patients with normal uterine cavities without any questionable areas were labeled as "NEGATIVE HYSTEROSCOPIC VIEW" when the following 3 criteria were met:

1. Good visualization of entire uterine cavity
2. No structural abnormalities in the cavity.
3. A uniformly thin, homogenous appearing endometrium without variation in thickness.

3. Dilatation and Curettage:

Under the sameanaesthesia, curettage was done with a sharp curette and the endometrial curettings were sent for histo-pathological examination.

POST-OPERATIVE:

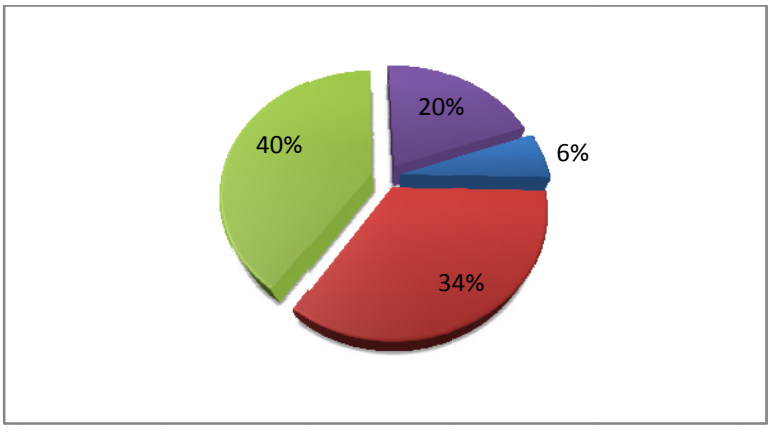
Post operatively vitals were monitored ,oral fluids started after four hours and were given broad spectrum antibiotic. Most of the patients were discharged on the next day.

OBSERVATIONS AND RESULTS

In the present study, Panoramic hysteroscopywas performed using a 5mmhysteroscope with 30 degrees fore oblique lens in 50 patients who presented with Abnormal Uterine Bleeding followed by Dilatation and Curettage. The endometriumwas sent for histopathological analysis .

TABLE - 1

AGE GROUPIN YEARS	NO OF PATIENTS	PERCENTAGE
20-29	3	6%
30 -39	17	34%
40-49	20	40%
50-60	10	20%

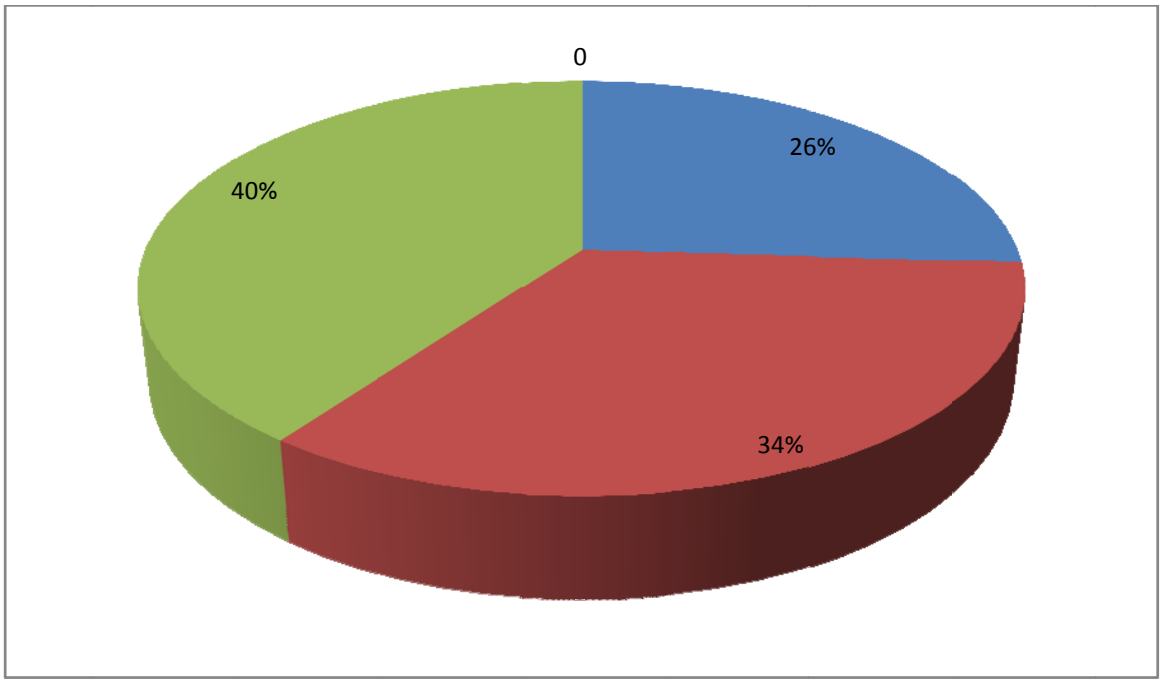


In the present study, maximum age incidence was between 40-49, 20 patients (40%). The youngest patient in this study was 24 yrs old and the oldest was 60 yrs old.

DURATION OF SYMPTOMS

TABLE 2

DURATION	NO OF PATIENTS	PERCENTAGE
<6 MONTHS	13	26%
6 MONTHS – 1 YR	17	34%
>1 YR	20	40%

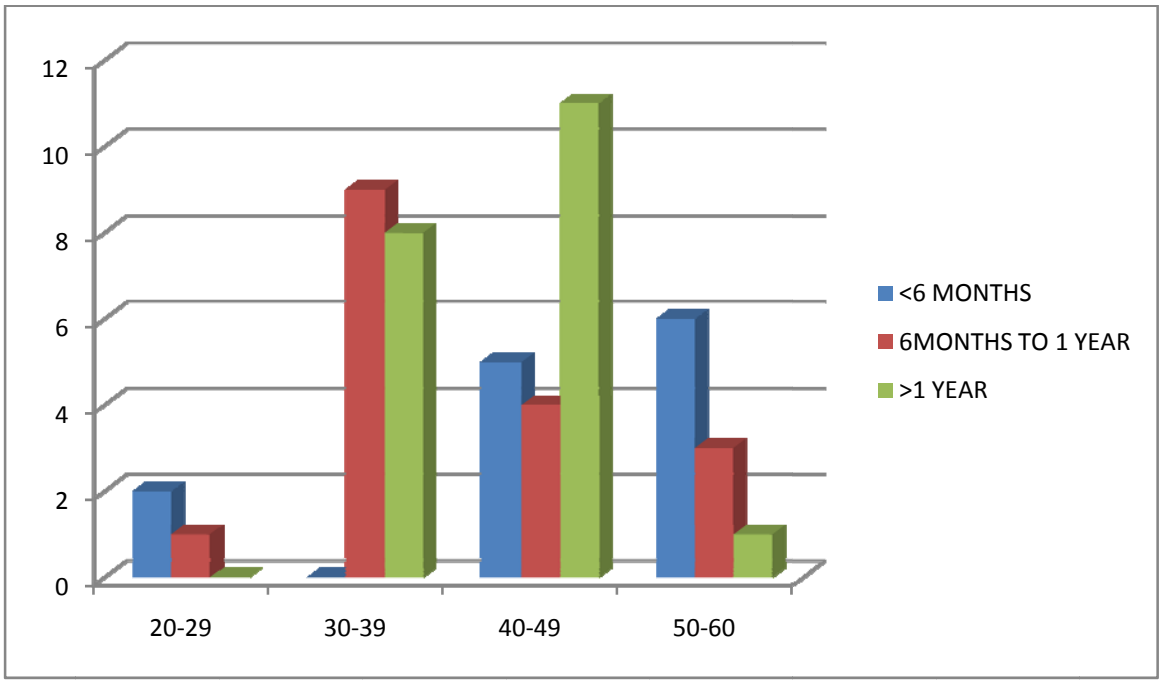


Of the 50 patients, majority: 20 patients (40%) had symptoms for more than 1 year, 17 patients (34%) had symptoms for 6 months to 1 year and 13 patients (26%) had symptoms for less than 6 months.

Correlation between age and duration of symptoms

TABLE 3

AGE / DURATION	< 6 MONTHS	6 MONTHS TO 1 YEAR	> 1 YEAR
20-29	2	1	0
30-39	0	9	8
40-49	5	4	11
50-60	6	3	1

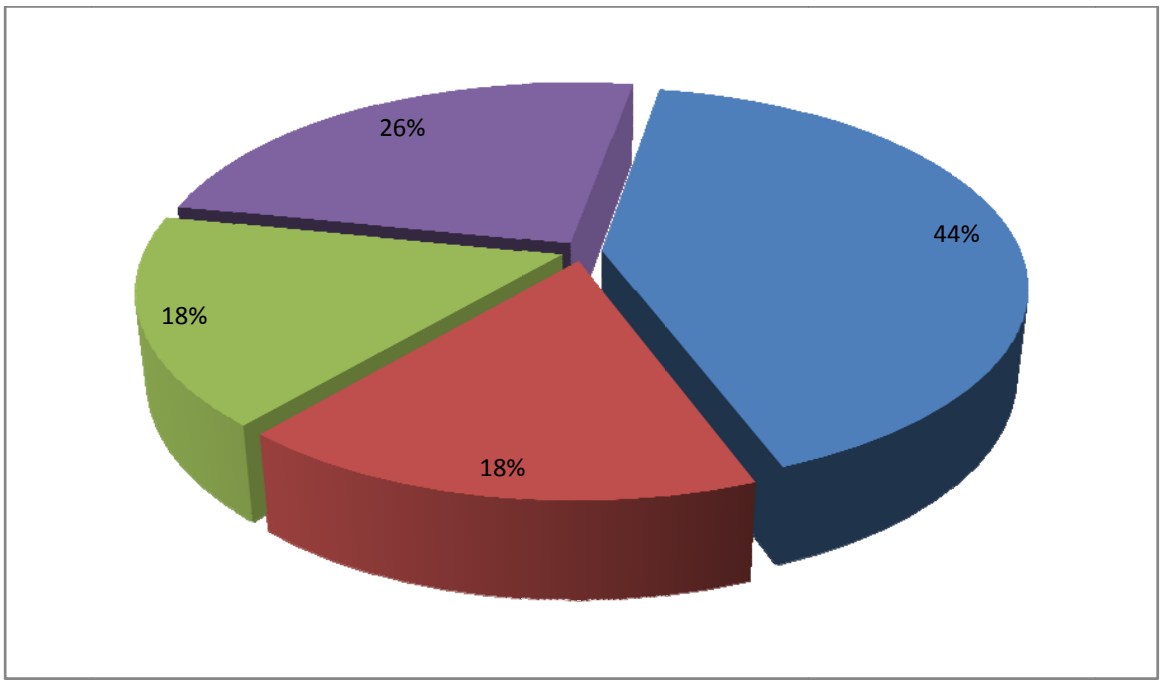


Of the 50 patients, patients in the age group of 30-39 had symptoms for 6 months to 1 year duration.

Parity

TABLE - 4

PARITY	NO. OF PATIENTS	PERCENTAGES
Nulliparous	6	12
Multiparous	26	56
Grandmulti	18	36

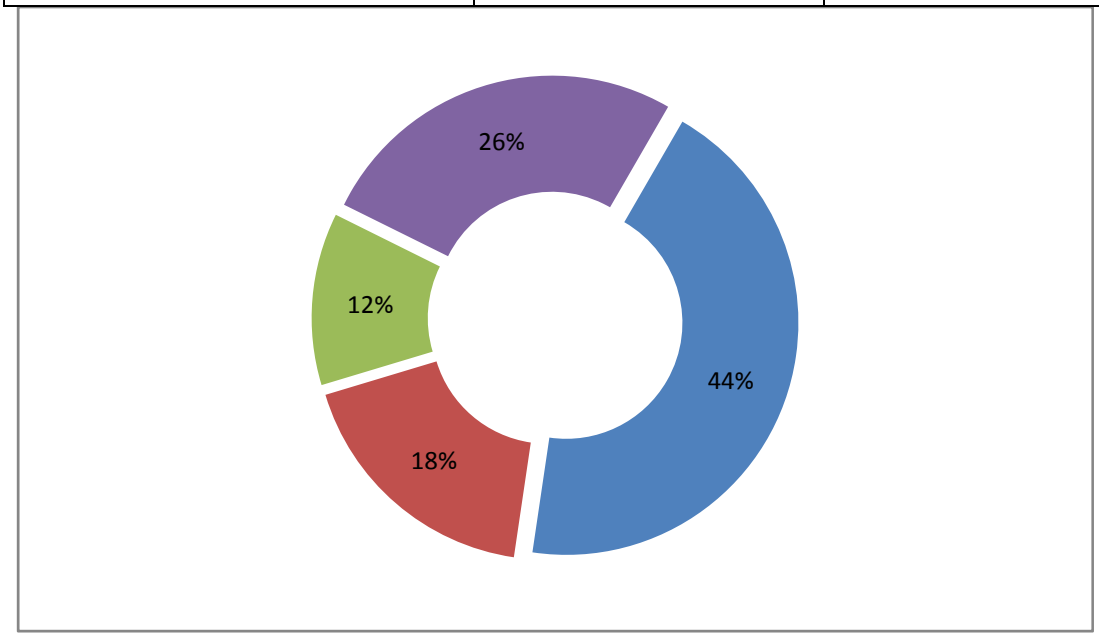


Of the 50 patients 26 cases were multipara, 18 cases of grandmulti and there were 6 cases of nulipariy.

CLINICAL PRESENTATION

TABLE 5

CLINICAL PRESENTATION	NO OF PATIENTS	PERCENTAGE
menorrhagia	22	44%
polymenorrhoea	9	18%
metorrhagia	6	12%
Postmenopausal bleeding	13	26%

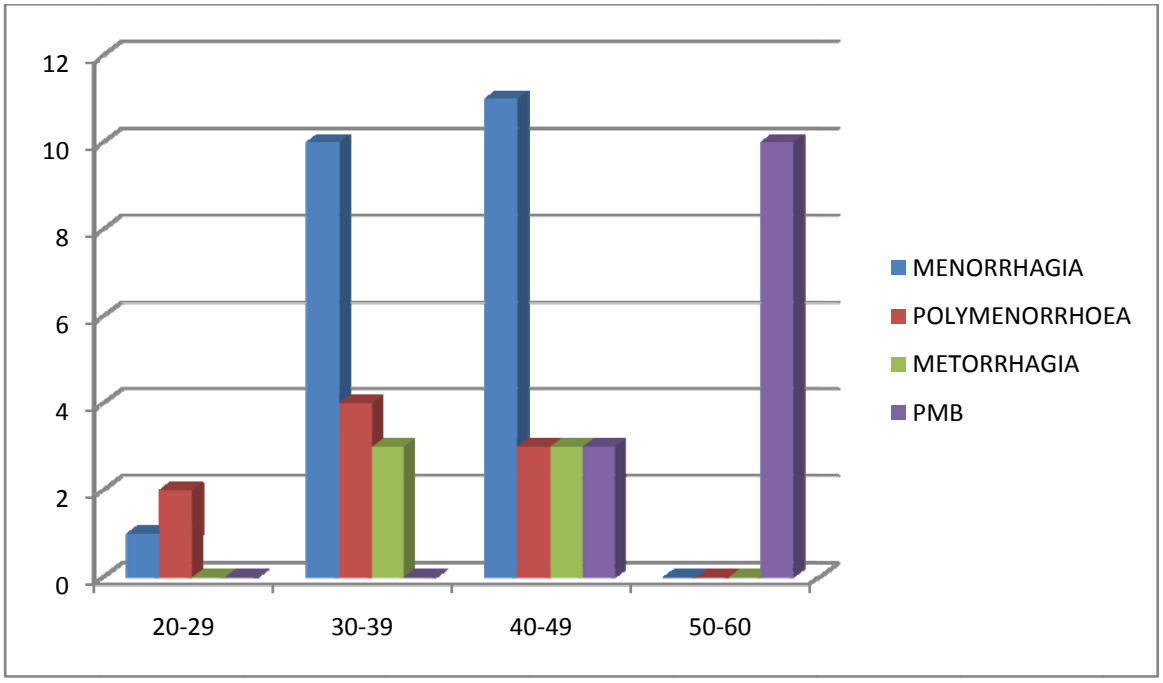


Majority of the patients, 22 (44%) presented with Menorrhagia. The second commonest group had Post-menopausal Bleeding, 13 cases (26%) .There were 9 cases (18%) with Polymenorrhagia and 6 patients (12%) with Metrorrhagia .

AGE DISTRIBUTION AND CONDITION EVALUATED

TABLE - 6

Age / Condition	20-29	30-39	40-49	50-60	Total No. of Patients
menorrhagia	1	10	11	0	22
polymenorrhoea	2	4	3	0	9
metorrhagia	0	3	3	0	6
Postmenopausal bleeding	0	0	3	10	13

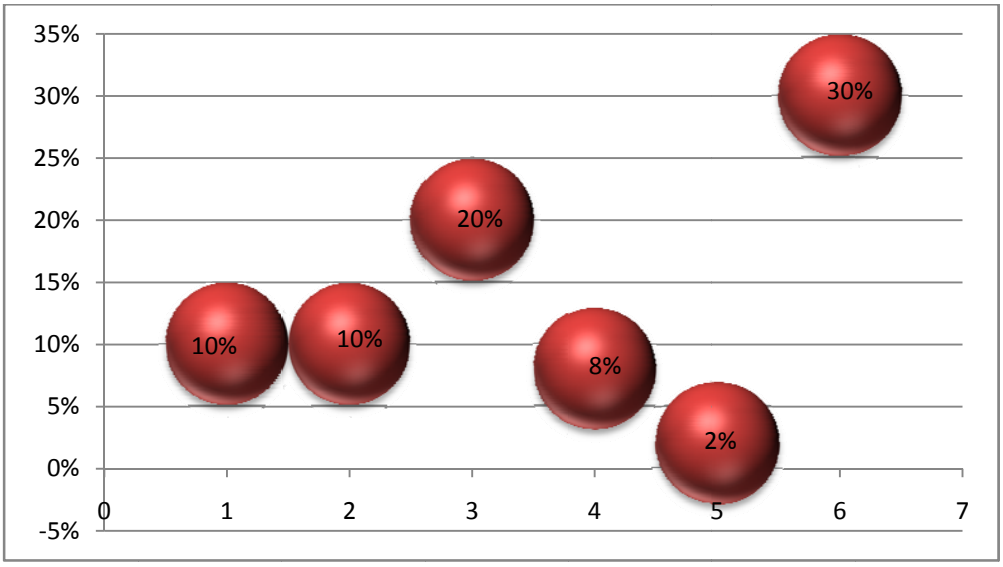


Of the 50 patients,polymenorrhoea was the common clinical presentation in the age group of 40-49 years and menorrhagia was the most common presentation in the age group of 30-39 years.

FINDINGS AT HYSTEROSCOPY

TABLE - 7

FINDINGS	NO OF PATIENTS	PERCENTAGE
E .POLYP	5	10%
SUBMUCOUS MYOMA	5	10%
E. HYPERPLASIA	10	20%
E. ATROPHY	4	8%
ENDOMETRITIS	1	2%
NORMAL	25	50 %

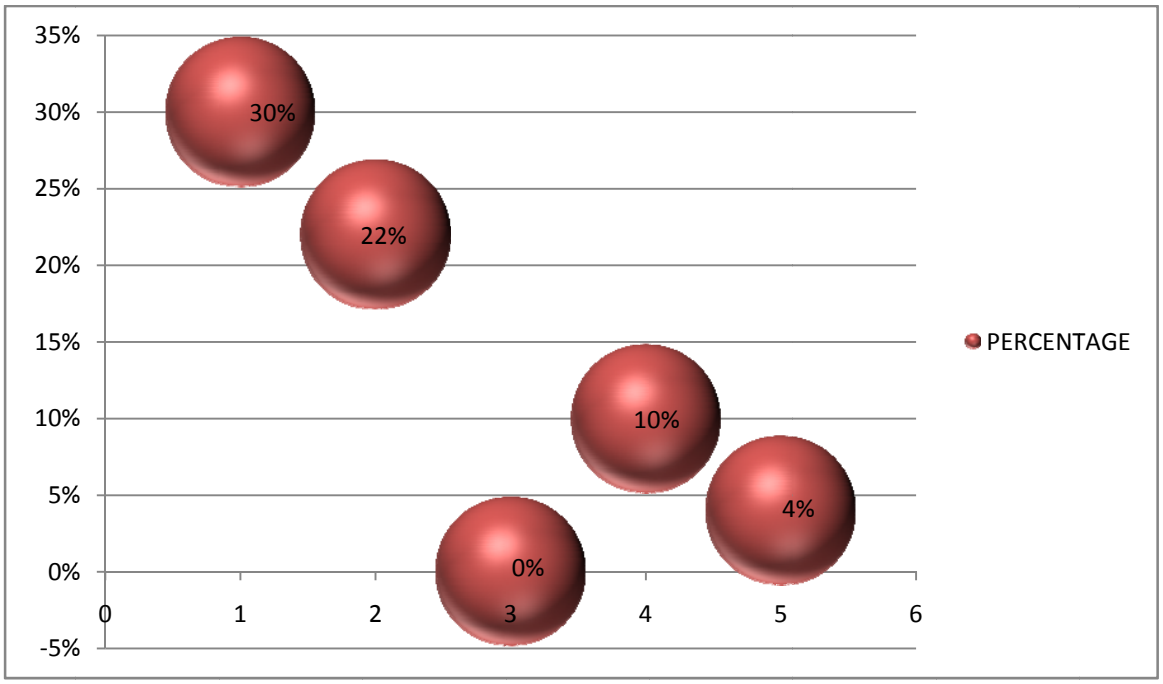


Abnormal findings were seen in 25 patients (50%), while in the remaining 25 patients (50%), no abnormality was detected (negative hysteroscopic view). The most common abnormality was Endometrial Hyperplasia (10 cases, 20%), followed by Endometrial Polyps (5 cases, 10%). There were also 5 cases (10%) of SubmucousMyomas, 4 cases (8%) of Endometrial Atrophy .

FINDINGS AT HISTOPATHOLOGY

TABLE - 8

FINDINGS	NO OF PATIENTS	PERCENTAGE
NORMAL	30	60%
ENDOMETRIAL HYPERPLASIA	11	22%
SUBMUCOUS MYOMA	0	0%
E . ATROPHY	5	10%
E . POLYP	2	4%
ENDOMETRITIS	0	0%
IRREGULAR SHEDDING	2	4%



Of the 30 normal cases (60%) reported, 8 cases had abnormal findings. The diagnosis of 3 cases of Endometrial Polyps and 5 cases of SubmucousMyoma was missed by Endometrial Histopathology.

Among the 11 cases of endometrial hyperplasia one case was associated with submucousmyoma which was missed by endometrial histopathology .Histopathology correctly diagnosed all the other cases of endometrial hyperplasia and irregular shedding endometrium .

VALIDITY OF HYSTEROSCOPY

TABLE - 9

HYSTEROSCOPY	DISEASE PRESENT	DISEASE ABSENT
POSITIVE	24 (a)	1 (b)
NEGATIVE	2(c)	23 (d)

(a) - true positive

(b)– false positive

(c) – false negative

(d)– true negative

- Θ Sensitivity: a /a+c x 100 = 24/26 x 100 = 92.30%
- Θ Specificity: d / b+dx 100 = 23/24 x 100 = 95.8%
- Θ Positive Predictive Value: a / a+b x 100 = 24/25 x 100 = 96 %
- Θ Negative Predictive Value: d / c+d x 100 = 23/25 x 100 = 92 %
- Θ False Positive Rate: b / b+d x 100 = 1/24 x 100 = 4.16 %
- Θ False Negative rate: c / a+c x 100 = 2/26 x 100 = 7.69 %
- Θ Concordance (Accuracy): a+d / a+b+c+d x 100 = 47/50 x 100 = 94 %

VALIDITY OF DILATATION AND CURETTAGE

TABLE - 10

DILATATION AND CURETTAGE	DISEASE PRESENT	DISEASE ABSENT
POSITIVE	18(a)	1(b)
NEGATIVE	8(c)	23(d)

(a) - true positive

(b)– false positive

(c) – false negative

(d)– true negative

- Θ Sensitivity: a /a+c x 100 = 18/26 x 100 = **69.2%**
- Θ Specificity: d / b+d x 100 = 23/24 x 100 = **95.8 %**
- Θ Positive Predictive Value: a / a+b x 100 = 18/19 x 100 = **94.7%**
- Θ Negative Predictive Value: d /c+d x 100 = 23/31 x 100 = **74.19 %**
- Θ False Positive Rate: b / b+d x 100 = 1/24 x 100 = **4.16 %**
- Θ False Negative rate: c / a+c x 100 = 8/26 x 100 = **30.76 %**
- Θ Concordance (Accuracy): a+d / a+b+c+d x 100 = 41/50 x 100 = **82%**

COMPARISON OF VALIDITIES

TABLE - 11

	HYSTEROSCOPY	HISTOPATHOLOGY
SENSITIVITY	92.3%	69.2%
SPECIFICITY	95.8%	95.8%
PPV	96%	94.7%
NPV	92%	74.19%
ACCURACY	94%	82%

Both hysteroscopy and curettage were accurate when an abnormality was diagnosed, giving a Specificity of 95.8%. and Positive Predictive Value (PPV) of 96% and 94.7% .

The ability to diagnose a lesion (Sensitivity) was more with Hysteroscopy in comparison to Curettage (92.3% v/s 69.2%), while a negative diagnosis was less wrongly made with Hysteroscopy (False Negative Ratio: 7.69% v/s 30.76%) .

FINAL DIAGNOSIS AFTER HYSTEROSCOPY AND HISTOPATHOLOGY

TABLE - 12

Diagnosis	Menorrhagia	Polymenorrhoea	Metrorrhagia	PMB	Total	
					No.	%
Polyp	4	0	0	1	5	10%
Submucousmyoma	2	3	0	0	5	10%
Hyperplasia	4	0	3	3	10	20%
Endometritis	0	0	0	0	0	0%
E. Atrophy	0	0	0	4	4	8 %
Irregular shedding	2	0	0	0	2	4%
Normal	10	6	3	5	24	48%
Total	22	9	6	13	50	100

Of the 50 patients tested 24 patients had normal findings, 26 patients had abnormal findings , out of which 5 (10%) cases had endometrial polyp,5(10%)had sub mucous myoma ,10 (20%) cases had endometrial hyperplasia , (8%) had endometrial atrophy,and 2(4%) had irregular shedding pattern of endometrium.

DISCUSSION

In the present study "A CLINICAL STUDY OF DIAGNOSTIC HYSTEROSCOPY IN ABNORMAL UTERINE BLEEDING AND ITS HISTOPATHOLOGICAL CORRELATION", diagnostic hysteroscopy was performed in 50 consecutive cases of AUB and its correlation withhistopathological findings were sought.

The age group in this study was between 20-60 years and maximum incidence was between 40-49yrs. Panda[33] found that maximum age incidence was between 35-45yrs in range between 25-70yrs. In Gianninoto's[39] series, age range was 38-80yrs and commonest incidence was between 30-45yrs. Trotsenburg[34] reported maximum age incidence between 41-50yrs.

The commonest presenting complaint in this series was menorrhagia (44%) followed by Postmenopausal Bleeding (26%) and Polymenorrhoea (18%). Panda's[33] series had 60% cases of menorrhagia followed by Polymenorrhagia and Metrorrhagia. In this study, abnormal findings on hysteroscopy were found in 26 patients (52%) while in the remaining 24 patients (48%), no abnormality was detected.

The following table compares normal and abnormal findings in hysteroscopy in various series:

Normal and Abnormal findings at Hysteroscopy in various series.

TABLE – 13

Sl. No.	Author (Year)	No. of Cases	Normal (%)	Abnormal (%)
1	Wamsteker (1984)	199	41.5	58.5
2	Gimpelson&Rappold (1988)	276	60	40
3	Loffer (1989)	91	48.66	51.44
4	Sheth (1990)	51	44	56
5	Parasnis (1992)	96	73.95	26.05
6	Neumann (1994)	85	55.2	44.8
7	Panda (1999)	66	46.6	53.4
8	Trotsenburg (2000)	819	66	34
9	Garuti (2001)	1500	61.8	38.2
10	Gianninoto (2003)	512	25	75
11	de Wit AC (2003)	1045	54.2	45.8
12	Present Series	50	48	52

Of the 26 cases with abnormal findings on hysteroscopy, commonest seen was Endometrial hyperplasia (10 cases, 20%), followed by Endometrial polyps (5 cases, 10%) and SubmucousMyoma (5 cases, 10%). Pandafound endometrial

hyperplasia in 28.3%, Wamstekerfound endometrial polyp in 19%, endometrial hyperplasia in 12.2% and submucousmyoma in 7.8%, Trotsenburgobserved myomas and polyps in 14% and deLewitreported myomas in 21% and polyps in 14.4%.

Hysteroscopy diagnosed all cases of endometrial hyperplasia, polyps and myomas with a specificity of 100%. Shethreported 81.8 % accuracy in diagnosis of polyps and myomas, while Garutireported 95.4% specificity in diagnosis of polyps.

In the present study, among the 50 patients tested , 26 patients actually had some pathology , of which 24 were accurately detected by hysteroscopy missed two cases of irregular shedding endometrium and hysteroscopy made a false positive diagnosis of endometritis in 1 case .These two cases of irregular shedding endometrium was accurately reported by histopathology .

Comparison of Accuracy of Hysteroscopy findings

TABLE – 14

Author	Accuracy	Misinterpretation
Baggish (1979)	87.5	12.5
Barbot (1980)[20]	84	16
Sheth (1990)[26]	82	18
Parasnis (1992)[27]	92	8
Panda (1999)[33]	92.69	7.31
Present Series	94	6

P VALUE : 0.00478 (statistically significant)

Hysteroscopy accurately detected endometrial polyp,submucous fibroid and all cases of endometrial hyperplasia .A study conducted by European society of Human reproduction & embryology 2002 concludes that hysteroscopy with endometrial biopsy is the "Gold standard"investigation for AUB[57].

A Cochrane database systems review 2007 ,compares Hysteroscopy and Dilatation and Curettage (D&C) showed D&C is obsolete because it is a blind methodwith a complication rate of 4 to 6.% and low sensitivity for local and pendunculatedintracavitaryleisions. It requires hospital stay and general anaesthesia. Withhysteroscopic visualization, organic leisions are not missed and directed biopsy can beperformed (Pellicano 2003). Astudy conducted at

University of Winconsin, Madison showedhysteroscope with biopsy allows visualization of endometrial cavity and is regarded asgold standard for endometrial assessment [58].

Comparison of Validity factors of **Hysteroscopy**

TABLE – 15

Author	Sensitivity	Specificity
Loverro (1996)	98	95
Garuti(2001)	94.2	88.8
Loffer(1989)	98	100
Parasnis (1992)	92	100
Panda (1999)	92.5	78.78
Present Series	92.3	95.8

Statistical analysis of sensitivity and specificity of hysteroscopy;

There is no significant difference between sensitivity and specificity obtained in this study and that obtained by various other authors. This confirms the validity of hysteroscopy done in the present study.

Comparison of Validity factors of Dilatation and Curettage

TABLE – 16

Author	Sensitivity	Specificity
Loverro(1996)	79.2	95
Garuti(2001)	78	94
Loffer(1989)	65	100
Parasnis (1992)	76	100
Present Series	69.2	95.8

A comparison of sensitivity and specificity of D&C obtained in the present study with those obtained by other authors shows no significant difference between the obtained values.

In the present series , of the 50 patients tested , 26 actually had pathology , out of which , 18 was accurately diagnosed by histopathology . Among the 8 cases missed 5 had submucousmyoma and 3 had endometrial polyp .

COMPARISON OF SENSITIVITY AND PREDICTIVE VALUES :

In the present series hysteroscopy showed a sensitivity of 92.3% ,were as curettage was 69.2% sensitive ,**with a P VALUE OF O.OOOO2** ,which is statistically significant .Hence hysteroscopy is 23% more sensitive than curettage and this is not due to chance. While comparing the negative predictive values ,hysteroscopy showed 92% and curettage showed 74.19% , **with a P VALUE OF 0.00036** , which is statistically significant .

In the present study, the results of hysteroscopy and dilatation and curettage were in agreement in 76% patients, hysteroscopy revealed moreinformation than curettage in 18 % patients and curettage revealed more information than hysteroscopy in 4% patients .This is comparable to other similar studies which shows that Panoramic Hysteroscopy is better than Curettage in the evaluation of abnormal uterine bleeding.

SUMMARY

- 50 Patients who presented with Abnormal Uterine Bleeding underwent panoramic hysteroscopy and subsequent Dilatation and Curettage.
- . Curetted endometrium was sent for histopathological examination.
- . Age group of the patients ranged from 20-60yrs and most common age group was 40-49yrs (40%).
- . Most of the patients (40%) had symptoms for more than 1 year and most common presenting symptom was Menorrhagia (44%) and Postmenopausal bleeding (26%).
- . Hysteroscopy reported 25 pts (50%) as negative view and 25 pts (50%) as abnormal view. But actually 24 patients were normal ,and 26 patients had some pathology .Hysteroscopy missed two cases of irregular shedding endometrium,
- . Endometrial hyperplasia (20%) was the most common abnormality, followed by endometrial polyp (14%).
- . The Sensitivity, Specificity, NPV and PPV for Hysteroscopy was 92.3%, 95.8%, 92% and 96% respectively and for D&C was 69.2%, 95.8%, 74.19% and 94.7% respectively.
- . The most consistent finding has been the detection of endometrial hyperplasia, endometrial polyp and submucousmyomas with 100% accuracy using hysteroscopy.

CONCLUSION

This study confirms that hysteroscopy is superior to curettage in evaluating patients with abnormal uterine bleeding.

Hysteroscopy is a safe, reliable and quick procedure in the diagnosis of cases with abnormal uterine bleeding with high sensitivity, specificity and negative predictive value .

In this study hysteroscopy correlated more with histopathologic findings and also identified associated pathology like polyps andsubmucousfibroids.It is both accurate and feasible when compared to histopathology in identifyingintracavitary abnormalities . Hence hysteroscopy forms an efficient investigative tool in diagnosing the endometrial pathology in cases of abnormal uterine bleeding . The technique may be learned with relative ease and it should become part of armamentarium of every gynaecologist .

ABBREVIATIONS

AUB : Abnormal Uterine Bleeding

BT : Bleeding time

CT : Clotting time

CO_2 : Carbon Dioxide gas

CNS : Central Nervous System

D&C : Dilatation and Curettage

DUB : Dysfunctional Uterine Bleeding

ECG : Electrocardiogram

HRT : Hormone Replacement Therapy

IUD : Intra Uterine Device

NPV : Negative Predictive Value

PMB : Post Menopausal Bleeding

PPV : Positive Predictive Value

Pts : Patients

RBS : Random Blood Sugar

Yrs : Years

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ANNEXURE 1

HYSTEROSCOPIC PROFORMA FORM

Name :

Age :

IP NO :

Education :

Occupation :

D.O.A :

S. E. Status :

D.O.OP :

Address :

D.O.D :

Complaints:

Past Contraception :

No of children :

L.C.B :

Sterilization done/not:

L.M.P :

Past history:

H/o D&C

Tubal ligation/ IUCD

Obstetric history:

Family history:

h/o bleeding disorders

Drug history:

Hormones for DUB

GENERAL EXAMINATION:

Vital data PR: BP:

Abdominal Examination:

Bimanual Pelvic Examination:

Uterus-size Shape:

Consistency: Surface:

Contour: Mobility:
Adnexae:

Speculum Examination:

P/V Examination:

Investigations:

Haemogram –
Urine – Alb, Sugar, Micro :

Blood grouping Rh typing :

Urine C/S :

Thyroid function tests :

X– Ray chest :

H/o diabetes

H/o hormone therapy

H/o bleeding disorders

H/o anticoagulant drugs

E.C.G :
U.S.G :
Other investigations :
Clinical diagnosis:
Hysteroscopy findings:
Cervix :
Endocervix :
Isthmus :
Endometrial cavity :
Endometrium :
Right cornu :
Right tubal ostium :
Left cornu :
Left tubal ostium :

ANNEXURE 2

SAMPLE OF INFORMED CONSENT FORM

Title of the project: A CLINICAL STUDY OF DIAGNOSTIC HYSTEROSCOPY IN ABNORMAL UTERINE BLEEDING AND ITS HISTOPATHOLOGICAL CORRELATION.

Purpose of research:

I have been informed that this study will evaluate the accuracy of hysteroscopy in the diagnosis of Abnormal Uterine Bleeding. This study will help Gynecologists in accurate diagnosis of cases of Abnormal Uterine Bleeding.

Procedure:

I understand that I will be undergoing this procedure for the evaluation of my condition. I am aware that immediately after completion of the procedure, I will be undergoing Dilatation and Curettage and the sample obtained from the curettage will be sent for histopathological analysis. I am also aware that I will be carefully observed and I will be asked a series of questions by the researcher pertaining to my condition. I will not be asked to make any special trips to the hospital for follow-up.

Risks and Discomforts:

I understand that the procedure of this study is not expected to aggravate any of the effects which are associated with the usual course of the treatment.

Benefits:

I understand that my participation in this study will have no direct benefits to me other than the potential benefit of the treatment. The major potential benefit is the accurate and the early diagnosis of my condition.

Alternatives:

I understand that the procedure which I am undergoing is the standard method of treating my problem.

Confidentiality:

I understand that the medical information produced in this study will become part of hospital records and will be subject to confidentiality record and privacy regulation of tirunelveli Medical College Hospital. Information of a sensitive nature will not be a part of the medical record, but will be stored in the investigator's research file and identified only by code number; the code key connecting name to numbers will be kept in a separate secure location.

If the data are used for publication in the medical literature or for teaching purposes, no names will be used and other identifiers such as photographs and audio and video tapes will be used only with my special written permission. I understand that I may see the photographs and the video tapes and hear the audio tapes before giving this permission.

I understand that the relevant designated authority and industrial sponsor are permitted to have access to my medical records and to the data produced by the study for audit purpose. However they are required to maintain confidentiality.

Request for more information:

I understand that I may ask questions about the study at any time and understand that I will be informed of any significant new finding discovered during the course of the study which might influence my continued participation.

If during the study or later I wish to discuss my participation in or concerns regarding this study with a person not directly involved, I am aware that the other staff members are available to talk to me.

A copy of this consent form will be given to me to keep for careful reading.

Refusal or withdrawal of participation:

I understand that my participation is voluntary and that I may refuse to participate or withdraw consent and discontinue participation in the study at any time without prejudice to my present or future care in the hospital and also understand that the researcher may terminate my participation in the study if at any time she feels the need and explain me the reason to do so and help to arrange for my further appropriate treatment.

I confirm that the researcher has explained to me the purpose of research, the study that I will undergo and the possible risks and discomforts as well as benefits that I may experience. I have read and I understand this consent form. Therefore I agree to give my consent to participate as a subject in this research project.

I have been explained in detail all the aspects of the procedure and consequences in my own vernacular language.

Participant: Witness:

Date: Date:

KEY TO MASTER CHART

1. Sl. no. : Serial number

2. Name :

3. Age (years) :

4. IP NO : In Patient Number

5 D.O.H : Date Of Hysteroscopy

6. Proliferative : Proliferative endometrium

7. Secretory : Secretory endometrium

8. E. hyperplasia : Endometrial hyperplasia

9. E. polyp : Endometrial polyp

10. Atrophic : Atrophic endometrium

11. PMB : Post menopausal bleeding

12. E. atrophy : Endometrial atrophy.

S. No	Name	Age	IP No.	Date of hysteroscopy	Clinical Presentation	Hysteroscopy findings	Histopathology findings
1	Mazhai Azhagu	43	56261	3/1/2011	Menorrhagia	Proliferative	Proliferative
2	Mariammal	41	2744	3/1/2011	Menorrhagia	Proliferative	Proliferative
3	Parvathi	44	3096	10/1/2011	Polymenorrhoea	Proliferative	Proliferative
4	Packiarathi	48	3936	17/1/2011	Menorrhagia	E. Polyp	Proliferative
5	Backialakshmi	48	34517	17/1/2011	PMB	Proliferative	Proliferative
6	Balarohini	40	34512	24/1/2011	Metorrhagia	Secretory	Secretory
7	Bhagavathi	40	27161	24/1/2011	Metorrhagia	E. Hyperplasia	Cystoglandular Hyperplasia
8	Jainambu	38	58331	7/2/2011	Menorrhagia	Secretory	Secretory
9	Thangathai	50	56085	14/2/2011	PMB	Proliferative	Proliferative
10	Mari	52	29398	22/3/2011	PMB	E. Hyperplasia	Simple hyperplasia
11	Krishnammal	28	56764	22/3/2011	Polymenorrhoea	Submucous myoma	Secretory
12	Esaiarasi	36	58315	4/4/2011	Menorrhagia	E. Polyp	Proliferative
13	Solai Ammal	40	5722	4/4/2011	Menorrhagia	Submucous myoma	Secretory
14	Vellathai	60	3750	11/4/2011	PMB	secretory	Secretory
15	Sulthan Beevi	32	57141	11/4/2011	Menorrhagia	Secretory	Secretory
16	Kannimariyal	48	36021	13/5/2011	PMB	atrophic	Atrophic
17	Rajabnisha	38	52661	13/5/2011	Polymenorrhoea	Proliferative	Proliferative
18	Kaliammal	50	36041	13/5/2011	PMB	E. Hyperplasia	Adenomatous hyperplasia
19	Thangam	41	43359	19/5/2011	Menorrhagia	Secretory	irregular shedding
20	Valliammal	41	15857	26/5/2011	Menorrhagia	Leiomyomatous Polyp	Benign Polyp
21	Ramalakshmi	37	13763	26/5/2011	Menorrhagia	E. Hyperplasia	Simple hyperplasia
22	Kaliammal	50	36041	26/5/2011	PMB	E. atrophy	Atrophic
23	Mary	41	40052	13/6/2011	Polymenorrhoea	Secretory	Secretory
24	Esakkiammal	45	57097	13/6/2011	Metorrhagia	E. Hyperplasia	Adenomatous hyperplasia
25	Gomathi	59	46901	20/6/2011	PMB	E. Polyp	Proliferative
26	Kaniammal	40	12111	20/6/2011	Menorrhagia	Secretory	Secretory

S. No	Name	Age	IP No.	Date of hysteroscopy	Clinical Presentation	Hysteroscopy findings	Histopathology findings
27	Malavika	34	58186	28/6/2011	Polymenorrhoea	Secretory	Secretory
28	Seethalamshmi	45	14159	30/6/2011	Menorrhagia	Simple cystic hyperplasia	Simple hyperplasia
29	Lakshmi	35	31429	11/7/2011	Metorrhagia	Proliferative	Proliferative
30	Kanka	47	19640	12/7/2011	Menorrhagia	E. Polyp	Benign Polyp
31	Velammal	50	28416	12/7/2011	PMB	Endometritis	Secretory
32	Balammal	33	42402	14/7/2011	Menorrhagia	Secretory	Secretory
33	Meena	50	7883	14/7/2011	PMB	E. Atrophy	Atrophic
34	Ponmari	34	12599	16/7/2011	Menorrhagia	proliferative	proliferative
35	Kani	33	38223	18/7/2011	Metorrhagia	Secretory	Secretory
36	Ganapathiammal	60	10931	18/7/2011	PMB	E. Atrophy	Atrophic
37	Sakthiselvi	40	9479	26/7/2011	Menorrhagia	Secretory	atrophic
38	Sornam	37	58182	26/7/2011	Polymenorrhoea	Submucous myoma	Secretory
39	Prema	36	21246	30/8/2011	Metorrhagia	E. Hyperplasia	Cystoglandular Hyperplasia
40	Mariammal	45	34888	5/9/2011	Menorrhagia	Proliferative	Proliferative
41	Muruganandhi	47	58304	5/9/2011	Polymenorrhoea	Proliferative	Proliferative
42	Pooncholai	48	12806	12/9/2011	PMB	E. Hyperplasia	Adenomatous hyperplasia
43	Selvi	36	34939	19/9/2011	Menorrhagia	Secretory	Secretory
44	Marikani	32	46894	26/9/2011	Menorrhagia	E. Hyperplasia	Simple hyperplasia
45	Devaki	24	56986	26/9/2011	Menorrhagia	Simple cystic hyperplasia	Simple hyperplasia
46	Vasantha	29	21246	26/9/2011	Polymenorrhoea	Submucous myoma	Secretory
47	Dhamayanthi	30	39861	10/10/2011	Menorrhagia	Submucous myoma	Simple hyperplasia
48	Subbulakshmi	36	40455	10/10/2011	Menorrhagia	secretory	irregular shedding
49	Saraswathi	50	44700	24/10/2011	PMB	Proliferative	Proliferative
50	Chellathai	34	42362	24/10/2011	Polymenorrhoea	Proliferative	Proliferative