Diagnostic accuracy of hysteroscopy in relation to histopathology in patients with abnormal uterine bleeding at a tertiary care centre, Secunderabad, India

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Abstract

Background: Judicious use of hysteroscopy to manage abnormal uterine bleeding (AUB) adds a new dimension in handling this perplexing problem. Hysteroscopy combined with histological examination is the new "Gold Standard" for evaluating a case of abnormal uterine bleeding

Objective: To study Diagnostic accuracy of hysteroscopy in relation to histopathology in patients with abnormal uterine bleeding

Methods: A hospital based diagnostic accuracy study was carried out among 100 women with abnormal uterine bleeding. All patients underwent the procedure of hysteroscopy. Samples were collected in all patients for histopathology confirmation of the hysteroscopy findings. Sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy were calculated for hysteroscopy in comparison to gold standard histopathology.

Results: Majority of the women belonged to 40-49 years (41%). Majority (37%) reported after one year of occurrence of the symptoms. Majority (54%) had menorrhagia. Hysteroscopy was found to be having good sensitivity and specificity in comparison to gold standard histopathology. Sensitivity=97.7%; specificity=78.5%, positive predictive value=78.1%; negative predictive value=97.7%; diagnostic accuracy=87% for hysteroscopy in comparison to histopathology.

Conclusion: Hysteroscopy is simple to perform and provides direct visualization of the uterus cavity and the endo-cervical canal. In abnormal uterine bleeding, quick and safe diagnosis is possible by hysteroscopy. In cases of endometrial polyp and sub mucous myoma which are pedunculated structures, diagnostic accuracy is greater with hysteroscopy and can be treated during the procedure itself. Thus, Hysteroscopic guided biopsy and histopathology is considered as new "Gold Standard" in diagnosis and often treatment of abnormal uterine bleeding.

Key words: Sensitivity, specificity, gold standard, bleeding, hysteroscopy

Introduction

Abnormal uterine bleeding (AUB) is the bleeding per vagina which is increased in quantity and/or increased duration and/or is out of schedule. It has been estimated that almost 30% of the women suffer from AUB and it is an important cause of frequent hospital visits.[1] AUB has a considerable impact on the life of the woman affecting their daily routine.[2]

Around one fourth of surgeries in the gynecology department can be attributed to AUB correction.[3] More than 40% of these cases due to myomas and polyps.[4] It has varied etiology. It can be due to many local conditions. It can also be as a result of systemic diseases for which one of the manifestations can be

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as AUB. It can also be due to any side effect of drugs[5].

Thus, AUB etiology can lead to difficulty in finding the exact cause. If the correct etiology is not found, the diagnosis is difficult and hence the management of the condition. The source and the site of the bleeding can be determined by careful and detailed history, complete and thorough clinical examination and precise pelvic examination. Previously ultrasonography as well as dilatation and curettage were used as a common investigation to evaluate the etiology of the AUB cases[6].

Dilatation and curettage have been designated as a blind procedure as the doctor is not able to see what exactly is going to happen while carrying out the procedure. It was considered as a gold standard but it has been shown that nearly 50% of the cases of endometrial polyp were totally missed.[7]

Hysteroscopy is considered as having high level of sensitivity and specificity (in comparison to histopathology findings) as there is chance of direct visualization. The doctor can directly see the condition of the uterine cavity and cervical canal. Hysteroscopy can be rigid or flexible depending upon the type of procedure used and required. It allows immediate diagnosis and can also have an added advantage of immediate surgical procedure in cases of submucous fibroids and polyps.[7]

Thus, the judicious use of hysteroscopy to manage AUB adds a new dimension in handling this perplexing problem. Hysteroscopy combined with histological examination is the new "Gold Standard" for evaluating a case of AUB.[7]

This study was taken up to analyze the role of hysteroscopy in evaluating abnormal uterine bleeding and contribution of the procedure for clinical diagnosis and treatment. It also aims to correlate histopathological results with hysteroscopy findings.

Material and Methods

Study design: The present study was hospital based diagnostic accuracy study

Gold standard: Histopathological findings were taken as gold standard to determine the diagnostic accuracy of hysteroscopy findings

Settings: Present study was carried out in the Department of Obstetrics and Gynaecology, Krishna Institute of Medical Sciences, Secunderabad

Sample size: 100 women who presented with AUB.

Study period: The study was carried out from April 2012 to June 2014.

Ethical considerations: Institution Ethics Committee permission was obtained. Informed consent was taken from all the patients. All patients were appropriately treated and followed

Inclusion criteria:

1. Patients with Abnormal Uterine bleeding in all age groups
2. Patients willing to participate in the study

Exclusion criteria:

1. Severe anemia, profuse bleeding, multiple/large fibroids, uterine infection, cancer cervix, pregnant women
2. Not willing to participate in the present study

Detailed history, thorough clinical examination was carried out and recorded in the pre designed, pre tested, and semi structured study questionnaire. Details of pelvic and abdominal examination findings were noted. Hysteroscopy was planned in the morning hours and hence patients were asked to be nil by mouth since 10 pm night. Surgical profile along with other required investigations was carried out well in advance to hysteroscopy. General anesthesia was used to perform hysteroscopy.

Hysteroscope:

Karl Storz hysteroscope with 4 mm 30-degree oblique lens telescope with 5mm outer sheath an operating sheath if required were used. This instrument was 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 was a feature of the hysteroscope. Telescope used was of 4mm 30 degrees oblique lens with a 5mm sheath. Illumination was provided by a xenon light source and was transmitted by a fibre optic cable. All hysteroscopies were done by one surgeon. No treatment was given prior to hysteroscopy in that menstrual cycle

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

Distension medium used was Normal Saline (0.9%). Hysteromat was used for creating intrauterine pressure

Procedure:

Under anaesthesia, after catheterising the bladder, a bimanual pelvic examination was done. After introducing Sim's speculum, the anterior lip of the cervix was caught with vulsellum. After measuring the length of the uterine cavity, the internal os was dilated with Hegar's dilator (whenever necessary). Upto 8 Hegar's dilator was needed in some patients. The hysteroscope was introduced into the cervical

canal under vision. The uterine cavity was distended with 0.9% normal saline and examined. The points noted were Endocervical canal, endometrial cavity, Nature and surface of endometrium, Fundus, Vascular pattern, bilateral ostia, any other pathology. Patients with uterine cavities without any questionable areas were labelled as Normal or 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.

Biopsy was taken in cases of submucous myoma. The hysteroscopic findings were described as: Proliferative endometrium: smooth, white/yellow surface, relatively poor superficial vascularization. Secretory endometrium: slightly rough, yellow/orange surface, superficial vessels have typical geometrical pattern mimicking a net. Atrophic endometrium: smooth and white surface, complete absence of superficial vessels. Endometrial hyperplasia: surface and colour are variable, endometrial height is uneven with pseudo polypoid aspect, rich vascularization with no specific pattern. Endometrial carcinoma-appears as irregular lesion, vascularization with surface ulceration and lesion. Endometrial polyp-appear smooth, discrete, shiny and vascular. Submucous myoma-appear smooth and paler than rest of the myoma

Dilatation and Curettage: Under the same anaesthesia, endometrial curettage was done with a sharp curette and the curetting were sent for histopathological examination. D&C after hysteroscopy was done via visualization**.**

Post-operative: Patients were observed for any complications and were put on a broad-spectrum antibiotic. Most of the patients were discharged on the same day.

Statistical analysis: The data was entered in the Microsoft Excel worksheet and analyzed using proportions. Sensitivity, specificity, positive predictive value and negative predictive value and diagnostic accuracy were calculated for hysteroscopy in comparison to gold standard of histopathology.

Results

Table 1: Distribution of the study subjects as per age and other parameters

Variable		Number	%
Age (years)	20-29	5	5
	30-39	19	19
	40-49	41	41
	50-59	23	23
	60 and above	12	12
Parity	Nulliparous	9	9
	1-2 children	58	58
	> 2 children	33	33

Majority of the women in the present study were in the age group of 40-49 years (41%) followed by the 50-59 years (23%). Majority of the women were having 1-2 children (58%). (Table 1)

Table 2: Clinical characteristics of the study subjects

Clinical characteristics		Number	%
Duration of symptoms	< 3 months	27	27
	3-12 months	36	36
	> 12 months	37	37
Symptoms	Menorrhagia	54	54
	Polymenorrhagia	6	6
	Metrorrhagia	8	8
	Post-menopausal bleeding	32	32
Previous surgeries	Lower segment caesarean section (LSCS)	11	11
	Dilatation and curettage (D&C)	2	2
	Other*	14	14
	No previous surgeries	73	73
Hemoglobin (gm/dl)	< 8	2	2
	8.1-10.9	41	41
	> 11	57	57

*other surgeries were non-pelvic surgeries undergone by patient such as orthopaedic surgeries, tonsillectomy, cholecystectomy etc

Majority of the women i.e. 37% reported after one year of occurrence of the symptoms. 36% reported within 3-12 months of occurrence of symptoms. Only 27% reported within 3 months of occurrence of symptoms. Of the total AUB cases, majority i.e. 54% had menorrhagia. 73% had no previous surgeries and majority i.e. 57% were not anemic (Hb > 11 gm/dl) (Table 2)

Table 3: Comparison of Hysteroscopy Findings with histopathological findings

Condition	Hysteroscopic findings	Histopathological findings	No. of false positive	No. of false negative
Endometrial polyp	34	28	6	0
Proliferative	28	34	0	6
Secretory	17	22	0	5
Endometrial atrophy	6	5	1	0
Sub mucous myoma	3	3	0	0
Endometrial hyperplasia	11	7	4	0
Endometrial carcinoma	1	1	0	0

Out of 34 cases diagnosed as endometrial polyp as per hysteroscopy, 28 were true positive and 6 were false positive. Out of 34 cases diagnosed as proliferative as per histopathology, 28 were true positive and 6 were false negative. But in case of endometrial carcinoma and sub mucous myoma, hysteroscopy there were no false positives and false negatives.

Table 4: Validity of hysteroscopy

Hysteroscopy findings	Histopathology findings		Total
	Disease* present	Disease absent	
Disease* present	43	12	55
Disease* absent	1	44	45
Total	44	56	100

Sensitivity=97.7%; specificity=78.5%, positive predictive value=78.1%; negative predictive value=97.7%; diagnostic accuracy=87%

**Disease means any abnormal finding either by histopathology or hysteroscopy like Endometrial polyp, Endometrial atrophy, Sub mucous myoma, Endometrial hyperplasia, and Endometrial carcinoma.*

Hysteroscopy was found to be having good sensitivity and specificity in comparison to gold standard histopathology

Discussion

We found that majority of the women belonged to the age of 40-49 years (41%). Panda A et al[8] also reported that the incidence of AUB was more in the age group of 35-45 years. Gianninoto A et al[9] also found that the most affected age group was 30-45 years. vanTrotsenburg M et al[10] also noted that AUB was common in the age group of 41-50 years.

In the present study, 54% women presented with menorrhagia, 32% with postmenopausal bleeding. Panda A et al[8] also observed that in their study 60% women had menorrhagia.

We noted that 55% had abnormal hysteroscopy and 45% had normal findings on hysteroscopy. Similar findings of high abnormal rate on hysteroscopy were reported by Panda A et al[8] and vanTrotsenburg M et al[10] but low rates of abnormality on hysteroscopy were reported by Gianninoto A et al[9] and Garuti G et al.[11]

56% of cases had normal endometrium on hysteroscopy in the present study. The sensitivity of hysteroscopy for normal endometrium was 78.5%, specificity was 97.7%, positive predictive value was 97.7% and the negative predictive value was 78.5%. Gribb JJ et al[12] found that 57% had normal endometrium on hysteroscopy which is similar to the present study but a low rate of 34% was reported by Jyotsana MK et al.[13]

11 cases were diagnosed as endometrial hyperplasia on hysteroscopy. But out of these 11, only six were confirmed as endometrial hyperplasia on histopathology. In all these cases, the endometrium appeared like thickened, edematous and undulating on hysteroscopy. These findings were similar to the findings from studies by Loverro G et al[14] and Panda A et al.[8]

On hysteroscopy endometrial polyps appeared as soft, pedunculated or sessile with smooth surface. 34 cases of endometrial polyps were diagnosed by hysteroscopy of which 28 were confirmed by histopathology. In this case the sensitivity was 100% and specificity was 91.6%. We noted that the diagnostic accuracy in this case was 94% while it was 100% in the study by Panda A et al[8], a bit lower i.e. 88.6% was noted by Valle RF et al.[15]

A round white coloured bulge with smooth surface as seen on hysteroscopy was diagnosed as submucous myoma. In addition to D&C, hysteroscopic guided biopsies were taken in these three cases. The sensitivity and positive predictive value were 100% for hysteroscopy in comparison to histopathology. Panda A et al[8] also reported similar findings.

In six patients, endometrium appeared thin, flat and fragile in hysteroscopy out of which 5 cases were deduced as atrophic in histopathology. One case was reported as proliferative endometrium. Sensitivity in this for hysteroscopy was 100% while specificity was 98.9%. The diagnostic accuracy was 99%. Similar

findings were reported by Panda A et al[8] and Sciarra JJ et al.[16]

In one case endometrium was hyperplastic with areas of ulceration and haemorrhage with increased vascularity which was deduced as carcinoma endometrium by hysteroscopy, the same was confirmed in histopathology as endometroid adenocarcinoma. Incidence of endometrial carcinoma was less in this study compared to previous studies[13,17]. Sensitivity and positive predictive value of hysteroscopy for endometrial carcinoma was 100%. Similar findings were also reported by Valle RF et al[15] and Panda A et al.[8]

Sinha P et al[18] examined 56 women of age 20-50 years with AUB by hysteroscopy followed by histopathology and calculated sensitivity, specificity and diagnostic accuracy for hysteroscopy. They found that mean age of patients was 36.4±7.6 years. They noted that majority i.e. 66.1% were diagnosed as menorrhagia which is similar to the present study findings of 54% having menorrhagia. They noted that sensitivity, specificity, PPV, NPV and accuracy values of 78.3, 63.6, 60, 80.8 and 69.6%, respectively which is lower when compared with present study findings.

Valson H et al[19] carried out a prospective study among 50 women of age 20 years and above with AUB. They compared hysteroscopic findings with histopathology. They performed hysteroscopy using 4mm rigid scope with normal saline as distending medium under general anesthesia. They found that specificity was 96.4%; PPV was 95.2%; sensitivity was 90.9% and NPV was 9.1% which are comparable with present study findings. They concluded that hysteroscopy was a sensitive diagnostic tool which gave a lot of useful information.

Loiacono RMR et al[20] conducted a retrospective study on 320 cases who had undergone transvaginal ultrasound, hysteroscopy and endometrial biopsy. The hysteroscopy gave sensitivity, specificity, PPV and NPV as 100%, 95%, 71%, and 100% respectively which are comparable with the present study findings. They concluded that hysteroscopy allowed accurate diagnosis in malignant endometrial pathology as well as benign endometrial pathology.

Conclusion: Hysteroscopy is simple to perform and provides direct visualization of uterus cavity and endo-cervical canal. In AUB, quick and safe diagnosis is possible by hysteroscopy. In cases of endometrial polyp and sub mucous myoma which are pedunculated structures, diagnostic accuracy is greater with hysteroscopy and can be treated during the procedure itself. Thus, hysteroscopy provides an useful diagnostic tool in women with AUB.

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