

Role of diagnostic hysteroscopy in case of abnormal uterine bleeding

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Abstract

Objective: The objective of study was to determine the role of diagnostic hysteroscopy in cases of abnormal uterine bleeding.

Study design: It was a cross sectional study.

Setting and duration : It was conducted in the department of Obstetrics and Gynaecology Unit II, Civil Hospital Karachi. The duration of study was fifteen months 1st January, 2008 to 30th March, 2009.

Methodology: Women of any age and parity who presented with complains of abnormal uterine bleeding were selected as non probability convenience. Total number of cases included were 80. The patients included in this study were properly counselled and informed consent was taken. The patients were evaluated by detailed history and examination. Relevant information were collected on proforma. Hysteroscopy was done under general anesthesia and followed by endometrial biopsy. At the end of hysteroscopic findings were correlated with pathology results.

Results: Diagnostic hysteroscopy for patients with abnormal uterine bleeding showed sensitivity of 97.9%, specificity of 90.6%, PPV of 94% and NPV of 96.7%. Sensitivity, specificity, PPV, NPV of the hysteroscopy for endometrial polyp were 93.3%, 98.5%, 93.3% and 98.55 respectively. These results were respectively, 100%, 100%, 100% and 100% for submucosal fibroids. 75%, 91.7%, 50% and 97.1% for endometrial atrophy and 75%, 96.6%, 85.7% and 93.9% for endometrial hyperplasia.

Conclusion: The result of this study show that hysteroscopy is a reliable method for evaluation of abnormal uterine bleeding, especially in benign lesions such as endometrial polyp and submucosal fibroid and it can be used as the first line diagnostic method for these abnormalities. However hysteroscopy should be combined with endometrial biopsy in order to increase the diagnostic accuracy.

Keywords: Abnormal uterine bleeding, Hysteroscopy, Endometrial biopsy

Introduction:

Abnormal uterine bleeding (AUB) is one of the most common gynecological complaints. Upto 33% of women referred to gynecological outpatient clinics have AUB. This proportion rises to 69% in peri or post-menopausal group.¹

AUB is a bleeding that is excessive or occurs outside of normal cyclic menstruation.

The primary goal of the clinical evaluation of

AUB is to establish a specific diagnosis in the most efficient and last invasive manner.² The most common procedure used to evaluate the endometrial cavity of a patient with abnormal uterine bleeding is dilatation and curettage (D & C).³ The D & C procedure has traditionally been considered as standard for the investigations of AUB. However several disadvantages of D & C have led investigators to look for alternatives to this procedure. This procedure required a general anesthesia in most of the cases.⁴

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This procedure required a general anesthesia in most of the cases. Apart from risk of general anesthesia, the procedure is expensive in term of hospital and theatre resources.

D&C is a blind procedure. It is essentially a random sampling of the endometrium with the possibility of error if the lesion is small or in accessible.⁵ The accuracy of dilation and curettage is decreased with focal lesions and many endometrial pathologies have been missed by endometrial curettage.³

Hysteroscopy is one of the oldest examination method used in the gynaecology. The direct view of the uterine cavity afforded by hysteroscopy offers a significant advantage over other methods such as hysterosalpingogram, D&C, and ultrasound, as these other modalities offer only a blind or indirect view of the cavity.³ hysteroscopy has been shown to be easy and acceptable^{6,7}. It is tolerated well as an outpatient procedure with high success rate.^{8,9,10} General anesthesia is not necessary for diagnostic hysteroscopy.¹¹ Hysteroscopy permits the direct visualization and assessment of the endocervical and uterine cavities.¹²

Diagnostic hysteroscopy has the significant lower complication rate.^{8,13} Hence, it is a safe procedure. In peri- and post- menopausal women it is essential to exclude endometrial carcinoma, although the incidence is 6.96 per 1000 women with postmenopausal bleeding. In younger women, endometrial hyperplasia and anatomical abnormalities, such as uterine fibroids, comprises the main pathology.

The recommendation regarding investigation of abnormal uterine bleeding from the Royal College of Obstetricians and Gynaecologist is that women over the age of 45, should be investigated with hysteroscopy and endometrial biopsy. Out-patient hysteroscopy is both feasible and highly acceptable in the majority of patients, giving a high detection rate for intrauterine pathology. It is more sensitive and specific than transvaginal ultrasound or blind endometrial sampling.¹⁴

The main purpose of this study was to determine the diagnostic value of hysteroscopy in evaluating the uterine cavity in order to improve the accuracy in investigating patients with abnormal uterine bleeding.

Material & Methods:

This is the cross sectional study conducted in the Department of Obstetrics & Gynae Unit II, Civil Hospital Karachi from 1st January 2008 to 30th March 2009. Total of 80 patients with complain of abnormal uterine bleeding were included in the study. If Women who were pregnant and who has history of cervicitis, vaginitis and endometritis, history of recent pelvic infection, history of uterine perforation, patients on oral contraceptive pills, were excluded from study was non probability convenience sampling.

The patients included in the study were admitted from outpatient department of Civil Hospital, Karachi. The patients were evaluated by taking detailed history. General, abdominal and pelvic examination was carried out. The purpose, benefits and complication of procedure were explained and informed consent was taken. Relevant information were collected on proforma. Blood picture, complete blood picture, random blood sugar, urine analysis was carried out, pelvic ultrasound was carried out in all cases.

Hysteroscopy was performed in operation theater. Hysteroscopic examination was preceded by Examination under anesthesia (EUA). Short acting general anesthesia was given using propofol or thiopentone. Rigid hysteroscope of 6mm with a 30 degree fore-oblique lens was used. The hysteroscope used in this study was rigid optical instrument with rod lens system. Uterine cavity distended with normal saline to allow the clear view. A continuous flow fluid under pressure of about 80-100 mm was needed to keep the view clear. After hysteroscopy was completed, sharp curettage was performed from all the uterine walls, with specific emphasis to any suspicious area and specimen obtained for histopathology.

Hysteroscopic findings were noted on proforma, later histopathology report was also entered into

proforma and correlated to evacuate the diagnostic potential of hysteroscopy. All the results were analyzed by computer software SPSS-12.

Results:

A total of 80 patients with complain of abnormal uterine bleeding were included in this study. The average age of patients was $41'45 \pm 8.36$ years (95% CL: 39.59 to 43.31) minimum age of patients was 22 years and maximum age was 60 years as shown in table 1. Most of the patients were of 40 to 60 years of age. Out of 80 patient, 46 patients (57%) were between para 1 to 5, 26 patients (33%) were with more than 5 children while only 8 patients (10%) were nullipara as shown in figure 1.

Presenting complain of patients with abnormal uterine bleeding are presented in table 2. Menorrhagia was the commonest presenting complain that was observed in 31 patients (38.8%) followed by polymenorrhagia in 20 patients (25%), intermenstrual bleeding was observed in 14 patients (17.5%), polymenorrhea in 9 patients (11.3%) and postmenopausal bleeding in 6 patients (7.5%). Presenting complain according to age group is presented in table 3.

30 patients (37.5%) had normal hysteroscopy and abnormalities were found in 50 (62.5%) hysteroscopies. Endometrial hyperplasia was suspected in 14 (17.5%) women, 15 (18.8%) patients was diagnosed to have endometrial polyp, endometrial atrophy in 12 (15%) and 9 (11.3%) had submucosal fibroid. Malignancy was not observed in this study. (Table 4). Histological examination revealed a normal endometrium in 32 specimen (40%) and abnormalities were observed in 48 specimens (60%) in which endometrial hyperplasia in 16 (20%), endometrial polyp in 15 (18.8%) patients, endometrial atrophy in 8 (10%) patients, fibroid in 9 (11.3%).

Out of 80 patients, 48 (60%) had intrauterine pathology and 32 (40%) had normal endometrium confirmed by histopathology. Of the 50 patients with abnormal hysteroscopies, 47 specimen had confirmed pathology (true positive) and 3 specimen were of normal endometrium (false posi-

tive) confirmed by hystopathology. Similarly, of those 30 patients with normal hysteroscopy, 29 patients had confirmed normal endometrium (true negative 0) and 1 patient had intrauterine pathology (false negative) confirmed by histopathology (table 5). Hysteroscopy for patients with abnormal uterine bleeding showed sensitivity of 97.9%, specificity of 90.6%, and positive predictive value of 94% and negative predictive value of 96.7%.

Endometrial hyperplasia:

Out of 80 patients, 16 (20%) had hyperplasia confirmed by histopathology. Hysteroscopy findings in 14 cases were of endometrial hyperplasia while histopathology examination confirmed hyperplasia in 12 of these cases (true positive). In another 2 cases (false positive) the histopathology did not indicate hyperplasia (differential diagnosis), 1 case was of endometrial polyp and another case was of atrophy. Similarly hysteroscopy finding in 66 cases were not suggestive of hyperplasia out of which 62 cases were confirmed by histopathology (true negative) and 4 cases (false negative) were of hyperplasia. Hysteroscopy gave the impression of normal endometrium in 1 case and atrophy in 3 cases. The sensitivity of hysteroscopy for diagnosis of endometrial hyperplasia was 75%, specificity of 96.9%, and positive predictive value of 85.7% and negative predictive value of 93.9% as shown in table 6.

Endometrial polyp:

Out of 80 patients, 15 (18.75%) had polyp confirmed by histopathology. Hysteroscopy findings in 15 cases were of endometrial polyp while histopathology examination confirmed polyp in 14 of these cases (true positive). In another 1 case (false positive) the histopathology finding did not indicate polyp and the case was diagnosed as atrophy by histopathology. Similarly hysteroscopy finding in 65 cases was not suggestive of polyp in which histology examination confirmed 64 cases were correctly diagnosed (true negative) and 1 case (false negative) was of polyp that was diagnosed by hysteroscopy as hyperplasia. The sensitivity of hysteroscopy for

Table 1: Descriptive statistics of age (n=80)

Statistics	Age (years)
Mean+ _ SD	41.45+ _ 8.36
95% confidence interval	39.59 to 43.31
Median (IQR)	42.5 (12)
Minimum age	22
Maximum age	60

Table 2: Presenting complain of abnormal uterine bleeding (n=80)

Presenting complain	Frequency	Percentage
menorrhagia	31	38.8%
polymenorrhagia	20	25.0%
Intermenstrual bleeding	14	17.5%
polymenorrhea	9	11.3%
Postmenopausal bleeding	6	7.5%

Table 3: Presenting complain according to age group (n=80)

Presenting complain	Age			
	< 30	31-40	41-50	>50
Menorrhagia (n=31)	3	10	18	0
Polymenorrhagia (n=20)	2	8	10	0
Intermenstrual bleeding (n=14)	4	6	3	1
Polymenorrhea (n=9)	1	2	5	1
Postmenopausal bleeding (n=6)	0	0	0	6

Table 4: Hysteroscopy and histopathology findings (n=80)

Finding	Hysteroscopy finding	Histopathology finding
Normal endometrium	30 (37.5%)	32 (40%)
Endometrial hyperplasia	14 (17%)	16 (20%)
Endometrial polyp	15 (18.8%)	15 (18.8%)
Fibroid	9 (11.3%)	9 (11.3%)
Suspected malignancy	0 (0%)	0 (0%)
Endometrial atrophy	12 (15%)	8 (10%)

Table 5: Overall comparison between hysteroscopy and histopathology (n=80)

Hysteroscopy	Histopathology (abnormal)	Histopathology (normal)	Total
Abnormal	47 (TP)	03 (FP)	50
Normal	01 (FN)	29 (TP)	30
Total	48	32	80

Sensitivity= TP/TP+FN=47/48* 100=97.9%

Specificity= TN/FP+TN=29/32* 100=90.6%

Positive predictive value= TP/TP+FP=47/50* 100=94%

Negative predictive value= TN/FN+TN=29/30* 100=96.7%

diagnosis of endometrial polyp was 93.3%, specificity of 98.5%, and positive predictive value of 93.3% and negative predictive value of 98.5% as shown in table 7.

Submucosal fibroid:

Out of 80 patients, 9 (11.25%) were fibroid confirmed by histopathology. Hysteroscopy finding in 9 case were fibroid and histopathology examination also confirmed fibroid in 9 of these cases (true positive) and 71 cases (true negative) were not fibroid. The sensitivity of hysteroscopy for diagnosis of endometrial fibroid was 100%, specificity of 100%, and positive predictive value of 100% and negative predictive value of 100% as shown in table 8.

Endometrial atrophy:

Out of 80 patients, 8 (10% had atrophy confirmed by histopathology. Hysteroscopy finding in 12 cases were endometrial atrophy while histopathology examination confirmed endometrial atrophy in 6 of these cases (9 true positive). In another 6 cases (false positive) the histopathology finding indicates different diagnosis, 3 cases were of normal endometrium and 3 case were of hyperplasia. Similarly hysteroscopy findings in 8 cases were not suggestive of atrophy in which histology examination confirmed 66 cases true negative) were not of atrophy and 2 cases (false negative) were of atrophy and these 2 cases were inaccurately diagnosed by hysteroscopy. The sensitivity of hysteroscopy for diagnosis of endometrial atrophy was 75%, specificity of 91.7%, and positive predictive value of 50% and negative predictive value of 97.1% as shown in table 9.

Diagnostic accuracy of hysteroscopy for diagnosis of abnormal endometrium and different pathology was presented in table 10. Overall diagnostic accuracy of hysteroscopy is 95% and for different endometrial hyperplasia 92.5%, polyp 97.5% and fibroid 100% and atrophy 90%.

Discussion:

Abnormal uterine bleeding is an extremely common indication for referral to gynaecologist.¹⁵ Hysteroscopy combined with guided biopsy is more sensitive in disclosing the type of lesion than D&C.¹⁶ Hysteroscopy is considered as gold standard for determining the cause of endometrial pathologies presenting with abnormal uterine bleeding.¹⁷

Table 6: Accuracy of hysteroscopy for endometrial hyperplasia (n=80)

Hysteroscopy for hyperplasia	Histopathology (YES)	Histopathology (NO)	Total
YES	12 (TP)	02 (FP)	14
NO	04 (FN)	62 (TP)	66
Total	16	64	80

Sensitivity= $TP/TP+FN=12/16*100=75\%$

Specificity= $TN/FP+TN=62/64*100=96.9\%$

Positive predictive value= $TP/TP+FP=12/14*100=85.7\%$

Negative predictive value= $TN/FN+TN=62/66*100=93.9\%$

Table 7: Accuracy of hysteroscopy for endometrial polyp (n=80)

Hysteroscopy for polyp	Histopathology (YES)	Histopathology (NO)	Total
YES	14 (TP)	01 (FP)	15
NO	01 (FN)	64 (TP)	65
Total	15	65	80

Sensitivity= $TP/TP+FN=14/15*100=93.3\%$

Specificity= $TN/FP+TN=64/65*100=98.5\%$

Positive predictive value= $TP/TP+FP=14/15*100=93.3\%$

Negative predictive value= $TN/FN+TN=64/65*100=98.5\%$

Table 8: Accuracy of hysteroscopy for submucosal fibroid (n=80)

Hysteroscopy for fibroid	Histopathology (YES)	Histopathology (NO)	Total
YES	09 (TP)	00 (FP)	09
NO	00 (FN)	71 (TP)	71
Total	09	71	80

Sensitivity= $TP/TP+FN=9/9*100=100\%$

Specificity= $TN/FP+TN=71/71*100=100\%$

Positive predictive value= $TP/TP+FP=9/9*100=100\%$

Negative predictive value= $TN/FN+TN=71/71*100=100\%$

Table 9: Accuracy of hysteroscopy for endometrial atrophy (n=80)

Hysteroscopy for atrophy	Histopathology (YES)	Histopathology (NO)	Total
YES	06 (TP)	06 (FP)	12
NO	02 (FN)	66 (TP)	68
Total	08	72	80

Sensitivity= $TP/TP+FN=6/8*100=75\%$

Specificity= $TN/FP+TN=71/71*100=91.7\%$

Positive predictive value= $TP/TP+FP=6/12*100=50\%$

Negative predictive value= $TN/FN+TN=66/68*100=97.1\%$

In this study 80 cases with abnormal uterine bleeding were included. It was observed that most of the patients were belong to 40-60 years of age, with an average age of the patients was 41.45 ± 8.36 years (95% CI; 39.59 to 43.32). The most common indication for hysteroscopy was menorrhagia that was observed in 31 patients (38.8%) and the least common was postmenopausal bleeding that was observed in 6 patients

(7.5%). The most common cause for AUB in this study was endometrial hyperplasia followed by endometrial polyp.

In our study, sensitivity, specificity, PPV and NPV of hysteroscopy in patients with AUB were 97.95%, 90.6%, 94% and 96.7% respectively. In the study of Allamah et al (2007), the sensitivity, specificity, PPV and NPV of hysteroscopy in the diagnosis of intrauterine lesions were 100%, 80.5%, 88.9% and 100% respectively¹¹. Barati et al (2008) reported sensitivity, specificity, PPV and NPV of 97.8%, 99%, 94% and 99% for hysteroscopy in diagnosing intracavitary pathology in women with AUB.¹⁸

The results of these studies are quite compatible with result of our study.

In the study of Jakab et al (2001), the sensitivity of hysteroscopy in the diagnosis of intrauterine lesion was 97%. Paschopoulos et al (2001) showed sensitivity and specificity of procedure as 92% and 95% respectively.¹¹

As is seen, most of studies have reported the sensitivity of hysteroscopy in diagnosing intrauterine lesions more than 90% that agrees with result of our study. This finding proves hysteroscopy as a valid diagnostic method in abnormal uterine bleeding.

In our study detection of endometrial polyp by hysteroscopy had sensitivity of 93.3%, specificity of 98.5%, PPV of 93.3% and NPV of 98.5%.

In the study of Allameh et al (2007), the sensitivity, specificity, PPV and NPV of hysteroscopy for detecting endometrial polyp were 93%, 100%, 100% and 95.4% respectively. Pasqualotto et al (2000) reported sensitivity of hysteroscopy for detection of endometrial polyp 99%, while Epstein et al (2001) reported it as 80%. In the study of Jakab et al (2002), the sensitivity of hysteroscopy in detection of circumscribed intrauterine lesion was 100%.¹¹

In the study of Kelekci et al (2005), hysteroscopy revealed a sensitivity of 80%, a specificity of 80.5%, PPV of 100% and NPV of 93.9% for de-

Table 10: Diagnostic accuracy of hysteroscopy in endometrial pathology (n=80)

Endometrial Pathology	Accuracy
Overall	95.0%
Endometrial hyperplasia	92.5%
Endometrial polyp	97.5%
Fibroid	100.0%
Endometrial atrophy	90.0%

Histopathology was gold standard.

tecting endometrial polyps.¹¹ therefor our study as well as other researches shows a high sensitivity of hysteroscopy in detection of endometrial polyp.

In this study, sensitivity, specificity, PPV and NPV of hysteroscopy in detection submucosal myoma were 100%, 100%, 100% and 100% respectively. In the study of Allameh et al (2007), the sensitivity, specificity, PPV, NPV of hysteroscopy for submucosal myoma was 100%, 96.4%, 88% and 100% respectively. Jakab et al (2002) and Pasqualotto et al (2000) also reported the sensitivity of hysteroscopy for detection of submucosal myoma as 100%.¹¹

In the study of Kelekci et al (2005), hysteroscopy had sensitivity, specificity, PPV and NPV of 100%, 100%, 100% and 100% respectively in detecting submucosal myoma.¹¹

Thus hysteroscopy has a high diagnostic ability in detection of localized intracavitary uterine lesions such as polyp and myoma. It is far from expectation of this procedure to ignore these lesions, the hysteroscopy relieves patients with these lesions from high cost and time waste resulting from additional interventions.

In our study detection of endometrial hyperplasia by hysteroscopy had sensitivity of 75%,

specificity of 96.9%, PPV of 85.7% and NPV of 93.5%.

Allameh et al reported the sensitivity, specificity, PPV and NPV of hysteroscopy for detecting endometrial hyperplasia as 25%, 89.7%, 12.5% and 93.3% respectively.¹¹

L. Birinyi et al reported the sensitivity of hysteroscopy in the diagnosis of hyperplasia as 52%, specificity 92%, PPV 35% and NPV 95%.¹⁹

These results shows that hysteroscopy is highly specific for diagnosing the endometrial hyperplasia, however the sensitivity is low.

In our study hysteroscopy showed sensitivity, specificity, PPV and NPV of 75%, 91.7%, 50% and 97.1% respectively for endometrial atrophy.

L. Birinyi et al reported the sensitivity of hysteroscopy in the diagnosis of endometrial atrophy as 73%, specificity 96%, PPV 44% and NPV 99%.¹⁹

No case of endometrial cancer was detected by hysteroscopy in our study, presumably, because the highest frequency of endometrial cancer is among the postmenopausal women with mean age of 61 years, while there were only 6 postmenopausal women in our study.

In the study of Sousa et al (2001), one postmenopausal women with abnormal uterine bleeding, hysteroscopy revealed sensitivity of 88.9%, specificity of 98.3%, PPV of 88% and NPV of 98.3% in detection of endometrial carcinoma, presenting as a superior diagnostic procedure compared to ultrasound.¹¹

Table 11: Comparison of hysteroscopy and histopathological examination of endometrial curettings (n=80)

Hysteroscopic impression	Normal endometrium	Endometrial hyperplasia	Endometrial polyp	Fibroid	Suspected malignancy	Endometrial atrophy	Total
Normal endometrium	29	1	0	0	0	0	30
Endometrial hyperplasia	0	12	1	0	0	1	14
Endometrial polyp	0	0	14	0	0	1	15
Fibroid	0	0	0	9	0	0	9
Suspected malignancy	0	0	0	0	0	0	0
Endometrial atrophy	3	3	0	0	0	6	12
Total	32	16	15	9	0	8	80

Our study shows that hysteroscopy is an accurate diagnostic tool for evaluation of patient with abnormal uterine bleeding, especially when circumscribed intracavitary lesions are the underlying disorders leading to AUB.

Further studies using the larger sample size are needed to determine the diagnostic value of hysteroscopy in detection of endometrial carcinoma.

No complication of the procedure were seen in this study, however the abdominal cramps was the only complaint that was observed in few patients. More than 80% of the patients were discharged from the hospital after 6 to 8 hours. During this study there was no case of perforation.

Conclusion:

We conclude that hysteroscopy is a reliable tool for evaluating the patients of AUB. It showed high accuracy in detecting the submucosal myoma, endometrial polyps and endometrial hyperplasia and should always be followed by endometrial biopsy.

Unfortunately the cost of hysteroscopes is very high and only few gynae units equipped with this apparatus in Pakistan. Secondly due to lack of health education patient compliance in respect of follow up is poor. With the provision of hysteroscope to all the main hospital and with health education of patients, we can serve the ailing humanity better as more and more research work will be done.

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