

Inaccuracy of Dilatation and Curettage in Detection of Uterine Disease for the Women with Abnormal Uterine Bleeding

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ABSTRACT

The purpose of this study was to evaluate the accuracy of dilatation and curettage (D&C) for the detection of uterine diseases in the patients with abnormal uterine bleeding (AUB). In this prospective study, histopathological results of D&Cs of 85 women with AUB were analyzed and compared to the results of their hysterectomy specimens. Sensitivity, specificity, positive and negative predictive values (PPV and NPV) was calculated for D&C histopathologic results. The women's mean age was 46.63 ± 8.53 years. Their mean hemoglobin levels and endometrial thicknesses were 12.63 ± 2.56 g/dL and 6.34 ± 8.16 mm, respectively. We found a reverse relationship between endometrial thickness and hemoglobin levels. For detection of endometrial polyps D&C had sensitivity of 80.0 %, specificity of 82.5 %, PPV of 22.2% and NPV of 98.5%. For detection of inactive endometrium, sensitivity, specificity, PPV and NPV of dilatation and curettage was 33.3%, 97.6%, 33.3% and 97.6% compared to hysterectomy results, respectively. Histopathologic examination of the hysterectomy specimens revealed myomas in 17 patients, intracavitary polyps in 5 patients and adenomyosis in 44 patients that were not reported in D&C results. The histopathologic results of D&C specimens matched only at 14.12% of the patients with the results of hysterectomy specimens. It appears that D&C may be appropriate for evaluation of endometrial pathologies however it seems to be an inadequate diagnostic tool for evaluation of the uterine diseases in the women with AUB.

Key words: Abnormal uterine bleeding, Hysterectomy, Dilatation and curettage, Diagnosis, endometrial histology.

INTRODUCTION

Abnormal uterine bleeding (AUB) is the most common reason for referral to gynecologists, and the problem has a huge burden on healthcare system¹ The etiology of abnormal uterine bleeding is varied and can arise from a bewildering number of sources such as pregnancy complications , anovulation associated conditions , submucosal fibroids , endometrial polyps , medication related conditions , endometrial hyperplasia , endometrial cancer , infection associated conditions , coagulation abnormalities , mullerian abnormalities and IUD complications²

Among the many structural lesions that cause AUB, some of the more common ones categorized as either focal (fibroids, polyp, adenomyosis) or diffuse (endometrial atrophy, hyperplasia or cancer and diffuse adenomyosis). Transvaginal ultrasonography (TVUS), saline infusion sonohysterogram (SIS), office hysteroscopy and Endometrial biopsy are the commonly used diagnostic methods for the causes of AUB^{3,4}. Histopathology plays a crucial role in delineating the boundaries of management of abnormal uterine bleeding .Accuracy of endometrial sampling using different commercial clinic biopsy discussed in some recent literature^{5,6}.

Endometrial biopsy results were also compared with the reference standards of dilatation and curettage (D&C) or hysterectomy histopathologic findings^{7,8}

Hysterectomy is the finally chosen treatment for structural lesions including adenomyosis, but usually less invasive approaches are tried initially. Endometrial curettage is not worthy for treatment of the women who are preoperatively diagnosed to have adenomyosis or uterine fibroids. Dilatation and curettage is the most widely used diagnostic and therapeutic intervention for AUB, especially in developing countries. D&C requires anesthesia and is associated with some potential complications. Recently some studies were conducted to evaluate less invasive alternative methods for diagnosis of endometrial disorders^{2,9, 4,10,11,12,13,14}. For many years dilatation and curettage has been the standard method for pathological examination of the endometrium in patients with AUB. In many studies dilatation and curettage has been chosen as the gold standard for comparison of other tests results^{15,16,17,18,19}. However, dilatation and curettage is a blind procedure, requires anesthesia and is associated with a number of potential complications²⁰. In some studies the histopathologic results of dilatation and curettage been have compared with that of postoperative hysterectomy specimens and some compared the grade of the lesion of the endometrium. These results revealed that dilatation and curettage was a low efficiency procedure for detection of endometrial lesions and even recognizing the grade of the lesions of the endometrium^{21,22,23,24,25,26}. Wang et al in comparison of dilatation and curettage and hysterectomy pathologic findings in 52 women with abnormal uterine bleeding and diagnosed or suspected endometrial cancer found that the diagnosis of grade of endometrial adenocarcinomas by dilatation and curettage were more frequently downgraded when compared with postoperative hysterectomy specimens. The accuracy of tumor grade diagnosis by dilatation and curettage was 50%. They emphasized on shortage of dilatation and curettage and suggested to develop or perform other techniques to evaluate endometrial disorders²². Bettocchi et al in a retrospective study analyzed the hospital records of 397 patients who underwent dilatation and curettage prior to

hysterectomy and compared histologic results of dilatation and curettage with those obtained after hysterectomy. In their study in 62.5% of cases dilatation and curettage failed to detect intrauterine disorders that were found on hysterectomy. They concluded that dilatation and curettage is an inadequate diagnostic and therapeutic tool for uterine disorders²³. Tabata et al evaluated the efficacy and morbidity of the dilatation and curettage and reported that complications of dilatation and curettage were 0.7%. They suggested for a routine curettage in patients with a history of AUB over the age of 40²⁰.

The aim of this study was to evaluate the accuracy of D&C for the detection of uterine histopathology in the women with AUB.

MATERIAL AND METHODS

This prospective study was conducted in gynecology clinics and wards of Shahid Faghihi and Hazrate Zeinab hospitals affiliated to Shiraz University of Medical Sciences and included 85 women with AUB, non-pregnant with ages of more than 30 who underwent dilatation and curettage and were also scheduled for hysterectomy for variable indications. The range of ages was from 30 to 75 years. All procedures were in accordance with the ethical standards for human experimentation established by declaration of Helsinki²⁷. The study was approved by the Ethics Committee and Institutional Review Board of Shiraz University of Medical Sciences with the number of EC-85-3176. All of the women received adequate information and signed an informed consent form before entrance into the study.

The data obtained were recorded on a data sheet including; age, gravidity, parity, symptoms, hemoglobin concentration, ultrasound findings of uterus, test results on D&C and final diagnosis obtained based on hysterectomy specimens. The dilatation and curettage and hysterectomy specimens were evaluated by only one pathologist and the results were analyzed and compared statistically. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of dilatation and curettage were calculated by 2X2 tables compared to

hysterectomy histopathology results as the golden standard for diagnosis of uterine diseases. All data were entered into SPSS 15.0 for Windows software for statistical analysis of correlation between variables (Pearson correlation coefficient).

RESULTS

Eighty five women entered this study with the mean ages of 46.63 ± 8.53 years. Their mean hemoglobin levels were 12.63 ± 2.56 g/dL and their mean endometrial thicknesses were 6.34 ± 8.16 mm. The reported results of histopathologic evaluation of D&C and hysterectomy specimens are reported in tables 1 and 2.

Histopathologic results of hysterectomy specimens were considered as the golden standard and were compared to D&C results. For detection of endometrial polyps D&C had sensitivity of 80.0 (29.9 – 98.9), specificity of 82.5 (72-89.8), positive predictive value (PPV) of 22.2 (7.4-48.1) and negative predictive value (NPV) of 98.5 (90.9 – 99.9).

For detection of inactive endometrium, sensitivity, specificity, PPV and NPV of dilatation and curettage was 33.3(1.8-87.5), 97.6(90.6 – 99.6), 33.3 (1.8-87.6) and 97.6(90.6 – 99.6), respectively. However to make the diagnosis of endometrial proliferation sensitivity, specificity, PPV and NPV of dilatation and curettage were 77.8 (40.2 – 96.1), 52.6(40.9 – 64.1), 16.3(7.3 – 31.3) and 95.2 (82.6-99.2) compared to hysterectomy results, respectively.

Pearson correlation analysis was performed for the age, gravidity, parity, hemoglobin concentration, endometrial thickness and is shown in table 3. Pearson correlation coefficient demonstrated that: there was no statistical relationship between the patients' age and endometrial thickness, and hemoglobin concentrations. There was a significant correlations between patients' age and gravid and parity. There was a significant correlation between endometrial thickness and hemoglobin concentrations. The results show that there is an inverse relationship between hemoglobin and endometrial thickness. So, increasing the endometrial thickness reduces the hemoglobin levels (Table 3).

The correlation of histologic results of dilatation and curettage with final diagnosis based on evaluation of hysterectomy specimens are exhibited in table (4). Among the 9 cases diagnosed as proliferative endometrium 7 cases (77.7%) matched the final diagnosis. Among the 5 cases diagnosed as endometrial polyp 4 cases (80%) matched the final diagnosis. Dilatation and curettage was not able to diagnose any cases with adenomyosis or myomas. (Table4).

Of the 85 women whose symptoms were studied, 45 cases (52.9%) had menorrhagia as the main symptom and only one (1.2%) had oligomenorrhea (Table 5). Among the patients with adenomyosis the main symptom was the menorrhagia (Table 6).

Table 1: Histopathologic findings of D&C specimens

Result	Frequency	Percentage
Proliferative endometrium	42	49.5
Endometrial polyp	18	21.2
Secretory endometrium	7	8.2
Inadequate	6	7
Asynchrony	5	5.9
Sloughing	4	4.7
Inactive endometrium	3	3.5
Total	85	100.0

Table 2: Histopathologic findings of Hysterectomy specimens

Result	Frequency	Percentage
Adenomyosis	44	51.8
Submucosal myoma	17	20
Proliferative endometrium	9	10.6
Secretory endometrium	6	7
Endometrial polyp	5	5.9
Inactive endometrium	3	3.5
Endometritis	1	1.2
Total	85	100.0

DISCUSSION

In the present study 80% of the polyps and 77.7% of the proliferative endometriums were correctly diagnosed by D&Cs. However dilatation and curettage is widely used for evaluation of abnormal uterine bleeding, the procedure does not sample the entire endometrial cavity and may miss the endometrial diseases in the corneal site of endometrial lining. Also, logically D&C is not able to evaluate myometrium and is not eligible to detect pathologies that are not located in the endometrial lining of the uterus. In some studies histopathological results of dilatation and curettage or endometrial sampling was selected as the standard tool in the methodology to compare other test results^{3,6,11}. However in our study the results of dilatation and curettage were compared with the definite diagnoses obtained by evaluation of the hysterectomy specimens. Hysterectomy is a major surgery and can be associated with morbidities and rarely mortalities. In a multicentre retrospective cohort study, Hirst *et al* reported that 11.3% of patients in a hysterectomy cohort group had experienced severe/major complications²⁸. Endometrial biopsy has been known as effective as D&C for evaluation of endometrium for bleeding problems, and in some studies used together with

dilatation and curettage as reference standard histologic result to compare other test or techniques^{6, 11}. An interesting finding obtained in this study is that adenomyosis was the most frequently reported pathologic condition (51.8%) among the women with abnormal uterine bleeding. Also we found that the most prevalent clinical symptom of the subjects with adenomyosis was menorrhagia (52.9%). we agree that D&C is not worthy for the diagnosis of these women with adenomyosis. Adenomyosis is a common gynecological disorder with a reported prevalence varying from 5 to 70% and a mean of 20-30% in women undergoing hysterectomy for benign gynecological disorders²⁹. Cirpan *et al* suggested that infiltration depth and spread of adenomatoid foci in histopathology of adenomyosis is related to clinical severity³⁰. Vercellini *et al* suggested that there is an association between parity and increased frequency of adenomyosis²⁹. However our study did not show any statistically significant relationship between age, parity or gravidity and frequency of adenomyosis. Although some experts³¹ believe that hysterectomy may be overused as treatment for AUB but hysterectomy still plays a major role in the management of the adenomyosis (the most prevalent causes of AUB in our study). In a recent review of a range of

Table 3: Relationship between the patients' age, gravidity, parity, endometrial thickness and hemoglobin concentrations

		age	gravida	parity	hemoglobin	endometrial thickness
age	Pearson Correlation	1	.422(**)	.488(**)	-.008	.079
	Sig. (2-tailed)		.000	.000	.943	.475
	N	85	85	85	85	85
gravida	Pearson Correlation	.422(**)	1	.863(**)	-.108	.112
	Sig. (2-tailed)	.000		.000	.326	.310
	Pearson Correlation	.488(**)	.863(**)	1	-.101	.165
parity	Sig. (2-tailed)	.000	.000		.355	.132
	Sig. (2-tailed)	.627	.685	.791	.595	.203
	Pearson Correlation	-.008	-.108	-.101	1	.229(*)
hemoglobin	Sig. (2-tailed)	.943	.326	.355		.035
	Pearson Correlation	.079	.112	.165	.229(*)	1
	Sig. (2-tailed)	.475	.310	.132	.035	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 4: Comparison of histopathological results of D&C to hysterectomy. Bolded numbers shows the matched results

D&C findings	Final diagnosis based on Hysterectomy findings							Total
	Adenomyosis	Myoma	Proliferative E*	Secretory E*	Polyp	Inactive E*	Endometritis	
Proliferative E*	22	10	7	3	0	0	0	42
Polyp	9	2	2	1	4	0	0	18
Secretory E*	3	2	0	0	1	0	1	7
Inadequate	2	1	0	1	0	2	0	6
Asynchrony	3	2	0	0	0	0	0	5
Sloughing	3	0	0	1	0	0	0	4
Inactive E*	2	0	0	0	0	1	0	3
Total	44	17	9	6	5	3	1	85

E*: Endometrium

therapeutic options for adenomyosis, medical management and various surgical modalities including hysterectomy have been discussed and the authors concluded that in the cases that future fertility is not an issue or in the severe cases where more than one-third of the myometrium is involved and other less invasive modalities failed, hysterectomy may still be the method of choice³²

Gredmark et al investigated the endometrial histopathological results of dilatation and curettage and reported that 9% of studied population had polyps³³. However endometrial polyp was reported in 18 (21.2%) of D&C results in our study.

Bettocchi et al in a retrospective study analyzed and compared histologic results of D&Cs with those obtained by hysterectomy. They concluded that D&C is rarely a therapeutic procedure, and all endometrial disorders were still present in the removed uterus. Also our study showed that D&C results for polyps matched at 80%

Table 5: Frequency of symptoms

Symptom	Number	Percentage
Menorrhagia	45	52.9
Menometrorrhagia	15	17.6
Hyper-menorrhea	9	10.6
Postmenopausal bleeding	8	9.4
Metrorrhagia	4	4.7
Postcoital bleeding	3	3.5
Oligomenorrhea	1	1.2

Table 6: Frequency of symptoms in the patients with adenomyosis

Symptom	Negative Result	Positive Result
Menorrhagia	24	21
Metrorrhagia	2	2
Menometrorrhagia	5	10
Postcoital bleeding	0	3
Postmenopausal bleeding	4	4
Oligomenorrhea	1	0
Hyper menorrhea	5	4

of the patients with hysterectomy results, meaning that the polyps were still present during hysterectomy and were not cured by the previous D&C. D&C is also an invasive intervention with certain complications and diagnostic shortcomings. D&C may miss critical endometrial lesions as it is done blindly and adenomyosis or submucosal myomas are not diagnosed by D&C because sampling from endometrium does not include myometrial specimens. Also pedunculated lesions such as incipient polyps may not be identified if the basal layer of endometrium is not included in the specimens and endometrium overlying sessile lesions such as submucosal myomas are usually normal. TVUS is considered as the procedure of choice for diagnosis of submucosal myomas³⁴. The limited value of D&C for diagnosis of endometrial polyps has been demonstrated in the literature³³. Hysteroscopy and SIS are reported to be the best methods to diagnose submucosal myomas and other protruded lesions of endometrium³.

A limitation of our study is its small sample size. Another limitation is that surgical procedures were performed by more than one of our well-experienced coworkers. However the strength of our study is that the specimens obtained by D&C or hysterectomy were all evaluated by only one pathologist to preventing any bias in the histopathology evaluations.

Our results showed that D&C and hysterectomy results matched in only 12 cases (14.12%) and D&C failed to detect the histopathologic condition responsible for AUB in 73 of the 85 cases. It seems reasonable to conclude, therefore, that D&C is an inadequate diagnostic tool for assessing uterine disorders. There are several other diagnostic methods for evaluation of endometrial lesions and conditions such as TVUS, office hysteroscopy, office endometrial biopsy, SIS or hysteroscopy that can be used for individualized cases as appropriate alternatives for D&C.

CONCLUSION

It appears that D&C may be appropriate for evaluation of endometrial diseases but is an inadequate diagnostic tool for evaluation of the uterine diseases in the women with AUB.

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