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Comparison of office hysteroscopy and dilatation & curettage regarding patient comfort, efficacy and quality of life in patients suffering from menorrhagia: prospective randomized study

M.K. Eken[1], F. Gungor Ugurlucan[2], G. Ilhan[3], E. Çöğendez[1], B. Devranoğlu[1], B. Keyif[4], A. Turfanda[2]

[1] Zeynep Kamil, Zeynep Kamil Educational and Research Hospital Obstetric and Gynaecology Department, Istanbul
[2] Istanbul University, Istanbul Medical Faculty Department of Obstetrics and Gynecology, Istanbul
[3] Süleymaniye Training and Research Hospital, Department of Obstetrics and Gynecology, Istanbul
[4] Istanbul University, Istanbul School of Medicine, Department of Obstetrics and Gynecology, Istanbul (Turkey)

Summary

Objective: Endometrial sampling is essential to exclude carcinoma and confirm the benign nature of abnormal uterine bleeding. Methods include endometrial biopsy, office hysteroscopy, and dilatation and curettage (D&C). The aim of this study was to evaluate the diagnostic efficacy of office hysteroscopy and D&C in patients suffering from menorrhagia, and to compare the tolerability and the outcome of the two procedures. *Materials and Methods:* Forty patients suffering from menorrhagia and willing to participate were included in this prospective study and randomized to office hysteroscopy (n=20) and D&C groups (n=20). Quality of life was evaluated using the Menorrhagia-Impact-Questionnaire (MIQ) before and three months after the procedure. Visual analogue scale (VAS) was used to evaluate the pain felt during the procedure. Primary outcomes were patient-reported improvement in menorrhagia and effect on quality of life. Secondary outcomes were objective improvement in the complete-blood-count, tolerability and complications of the procedure, and pathology results. *Results:* There was a significant difference in the mean VAS results for pain in the office hysteroscopy and D&C groups ($p = 0.00$). In the MIQ domains, there was a significant improvement in the perception of blood loss in both groups, which was more significant in the office hysteroscopy group when compared to the D&C group. There was a significant improvement in the limitations in work inside/outside home, limitations in physical and social activities in the office hysteroscopy group, and the differences were significant when compared with the D&C group. In the assessment of change in blood loss, the difference between the two groups after the procedure was significant. Twenty patients (100%) in the office hysteroscopy group and 19 patients (95%) in the D&C group suggested that this was a remarkable and important change. Two patients in each group had insufficient tissue for diagnosis. Eight patients in the office hysteroscopy group whereas three patients in the D&C group had endometrial polyps. In one patient in the D&C group, pathology result was submucous leiomyoma. *Conclusion:* There was a significant patient-reported improvement in menorrhagia and positive effect on quality of life after office hysteroscopy when compared to D&C. Pain was significantly less in the office hysteroscopy when compared to D&C even in patients with lower number of deliveries. Office hysteroscopy was superior to D&C in the diagnosis of intracavitary pathologies.

Key words: Menorrhagia; Office hysteroscopy; Dilatation and curettage; Quality of life.

Introduction

Abnormal uterine bleeding is a major gynecological problem, accounting for 33% of outpatient referrals and 25% of gynecological operations [1]. Menorrhagia, or heavy menstrual bleeding, is defined as excessive menstrual blood loss greater than 80 ml that occurs alone or in combination with other symptoms and has a negative impact on a woman's physical, social, and emotional quality of life [2, 3]. The most common causes of abnormal uterine bleeding include uterine pathologies, such as endometrial polyps, adenomyosis, uterine leiomyomas, and endometrial hyperplasia or carcinoma. Other possible etiologies include systemic conditions, such as coagulopathies, both inherited and acquired, and ovulatory dysfunction [4].

Evaluation of abnormal uterine bleeding is essential in women to exclude endometrial carcinoma and confirm the benign nature of the problems. Endometrial sampling should be performed in patients with abnormal uterine bleeding who are older than 45 years and in patients younger than 45 years, with a history of unopposed estrogen exposure, failed medical management, and persistent bleeding [4]. Endometrial sampling may be performed by catheters, dilatation and curettage (D&C), and hysteroscopy.

D&C was first described by Recaimer in 1843 and has been accepted as the gold standard for endometrial sampling [5]. However in 60 % of cases, less than half of the uterine cavity is curetted, with the added risk of general anesthesia, infection, and perforation [6, 7].

Office hysteroscopy is a reliable and simple to apply diagnostic tool which enables the visualization of the vagina,

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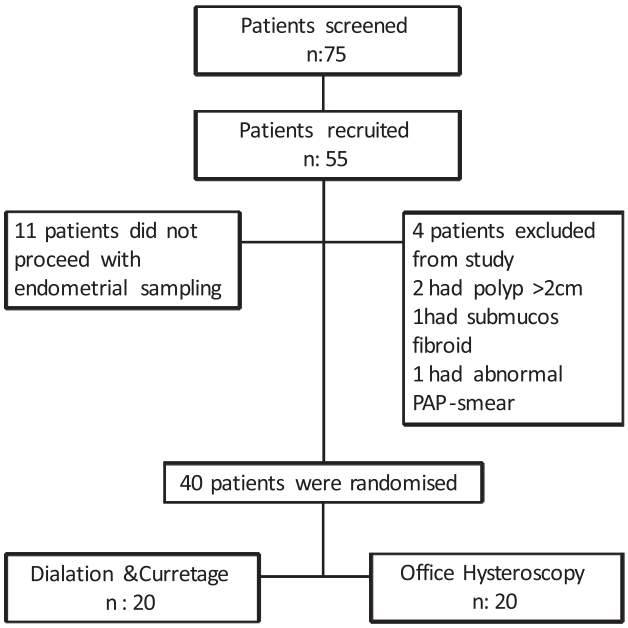

Figure 1. — Flow chart of the study population.

endocervical canal, and uterine cavity that can be used in the diagnosis and treatment of intrauterine pathology in the same session. Along with gaining importance of non-invasive or minimally invasive diagnostic methods in modern gynecology, hysteroscopy has become increasingly more popular [8].

The present authors' aim in this study was to evaluate the diagnostic efficacy of D&C and hysteroscopy in patients suffering from menorrhagia and to compare the tolerability and the outcome of the two procedures.

Materials and Methods

From July to October 2012, 40 patients suffering from menorrhagia and willing to participate were included in this prospective randomized study. Exclusion criteria were pregnancy, postmenopausal bleeding, abnormal uterine bleeding in adolescence, presence of hematological or oncological diseases and drugs (e.g. warfarin, heparin) that cause bleeding-coagulation disorders, visible or suspicious lesions of cervix and cervical smear abnormalities, allergy to prilocaine, povidone iodine or indomethacin, and presence of acute genital tract infection. Randomization was carried out using computer-generated random allocations prepared by an investigator with no clinical involvement in the trial. Ethics approval was obtained from the institutional ethics committee. Informed consent was obtained from each patient.

Seventy-five patients were screened for the study, 55 were recruited, and 11 of the patients were excluded because they did not proceed with endometrial sampling as detailed in Figure 1. Four patients were excluded from the study because two of them had polyps larger than two cm and one patient had a submucosal leiomyoma, which were treated with operative hysteroscopy. One patient had an abnormal PAP-smear result and was excluded from the study. Forty patients were randomized: 20 patients underwent office hysteroscopy and 20 patients underwent D&C.

Before the procedure, all patients underwent symptom assessment regarding abnormal menstrual bleeding and physical and gynecological examination, including PAP-smear screening. Transvaginal sonography was used to evaluate uterine pathologies for all patients. Complete blood count, prothrombin time (PT), activated partial thromboplastin time (aPTT), beta-hCG, follicle stimulating hormone (FSH), luteinizing hormone (LH), and estradiol (E_2) tests were performed on the third day of the cycle. The impact of menorrhagia on quality of life was evaluated using the Menorrhagia Impact Questionnaire (MIQ) before and three months after the procedure. Visual analogue scale (VAS) was used to evaluate the pain felt during the procedure and ease of the procedure.

All procedures were performed by the same operator. Office hysteroscopy was performed under local anesthesia in dorsal lithotomy position. After cleansing the external genitalia and the vagina with povidone-iodine, a speculum was used to visualize the cervix. Paracervical block was performed and then the cervix was held with a tenaculum. A 2.9 mm diameter, 30 cm length, 30° telescope, and five-mm sheath office hysteroscopy was used. The cervical canal and the uterine cavity were entered under direct visualization with the aid of hydro-distention for cervical dilation. Normal saline was used as the distention media and was sent into the cavity from a height of two meters providing maximum 80-100 mmHg intrauterine pressures created by a blood pressure cuff. After entering the uterine cavity, the tenaculum and the speculum were removed. During the procedure, the endocervical canal, uterine cavity, and the tubal ostia were visualized. Adhesions, polyps, fibroids, any other abnormalities in the uterine cavity were noted. Polyps less than two cm and adhesions were excised by hysteroscopic scissors and endometrial biopsy was taken with the help of hysteroscopic scissors from all patients.

D&C was performed under local anesthesia in dorsal lithotomy position. After cleansing the external genitalia and the vagina with povidone-iodine, a speculum was used to visualize the cervix. Paracervical block was performed and then the cervix was held with a tenaculum. Cervical dilatation was performed with Hegar dilators up to 7.5 mm and endometrial biopsy was taken with sharp curettage from all endometrial walls.

For analgesia and anesthesia, 100 mg rectal indomethacin was used one hour before the procedure and paracervical block was performed with ten-ml 2% prilocaine, which was applied 0.5 to one cm depth of mucosa on both sides of the cervix at the lateral fornices three minutes before the procedure and before holding the cervix with a tenaculum. Single dose one-gram oral azithromycin was prescribed for prophylaxis after all of the procedures.

Patient follow-up was performed at one and three months after the procedure for all patients by the same physician. Patients were questioned regarding any complications using a standard list and all the symptoms and signs during these follow-ups were documented. MIQ was filled out at three months after the procedure. Complete blood count was performed at three months after the procedure.

The primary outcome was patient-reported improvement in menorrhagia; women who reported having either completely normal menstrual cycles or who reported that their bleeding was improved and effect on quality of life. Secondary outcomes included the objective improvement rates in the complete blood count, tolerability of the procedure, complications during or after the procedure, and pathology results.

Statistical analyses were performed with the computer program IBM Statistical Package for the Social Sciences (SPSS) version 20.0 by a professional statistician. Differences between the two groups for categorical variables were assessed using Chi-square and Fisher's exact tests. Mann–Whitney U test was used for comparing variables between the two treatment groups, and the

Table 1. — *Demographic features of the patients.*

	Office hysteroscopy (mean±SD)	Dilatation & curettage (mean±SD)	*p* value
Age (years)	37.5±8.1	45.1±3.5	0.001*
BMI (kg/m^2)	26.5±5.5	28.9±4.6	0.114*
Parity (n)	2.9±1.9	3.8±1.6	0.031
Vaginal delivery (n)	1.9±1.5 (16)	2.3±1.5 (17)	0.361
Cesarian delivery (n)	0.7±1.03 (9)	0.6±0.7 (8)	0.951

BMI: body mass index; *$p < 0.05$.

Table 2. — *Hormone levels on day 3 of the cycle and hemoglobin levels before and after the procedure.*

	Office hysteroscopy (mean±SD)	Dilatation & curettage (mean±SD)	*p* value*
FSH (mIU/ml)	8.7±5.5	13.5±11.4	0.09
LH (mIU/ml)	4.9±1.8	9.3±7.6	0.05
Estradiol (pg/ml)	57.7± 41.7	96.8±114.3	0.95
TSH (mIU/ml)	2.3±2.0	2.5±2.2	0.65
Prolactin (ng/ml)	12.0±5.2	11.6±4.5	0.92
Hb mg/dl (before procedure)	10.9±1.6	10.6±1.9	0.68
Hb mg/dl (after procedure)	11.4±1.1	10.9±2.1	0.99
Hb mg/dl (before-after procedure, *p* values)	0.024	0.445	

FSH: follicle stimulating hormone; LH: luteinizing hormone; TSH: thyroid stimulating hormone; Hb: hemoglobin. *$p < 0.05$.

Wilcoxon signed-rank test was used for preoperative and postoperative comparison. *P* value < 0.05 was considered statistically significant at 95% confidence interval.

Results

Forty patients were included in the study. There was no significant difference between the two groups regarding patient characteristics except for age and parity. The mean age of the patients and the number of deliveries in the office hysteroscopy group was lower than that in the D&C group. Demographic variables are summarized in Table 1. There was no difference between the two groups regarding hormone levels at day 3 of the cycle and hemoglobin level before the procedure. The results are summarized in Table 2.

All of the patients in both groups tolerated the procedures well. No complications developed during either procedure. The mean VAS score result for pain in the office hysteroscopy was 2.8 ± 1.5, whereas it was 7.6 ± 1.4 in the D&C group. The difference was statistically significant ($p < 0.001$) (Figure 2).

The distribution of MIQ results before and three months after the procedure in the office hysteroscopy and D&C groups are summarized in Table 3. For the perception of the amount of blood loss the majority of the patients in the office hysteroscopy group suggested that eight patients (40%) had heavy bleeding, seven (35%) patients had very heavy bleeding, and the remaining five patients (25%) had moderate bleeding.

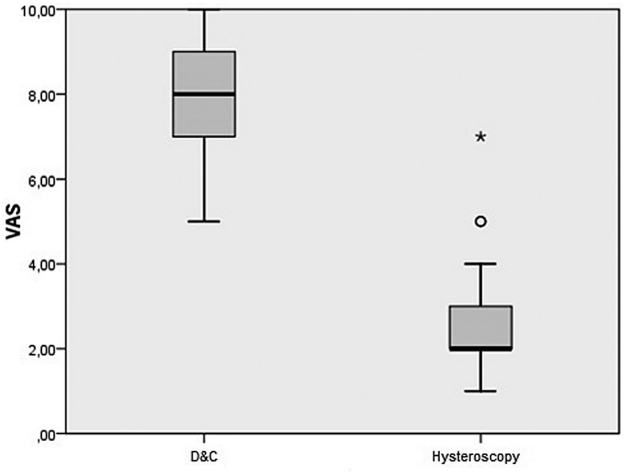

Figure 2. — Distribution of visual analogue scale (VAS) score.

In the D&C group, five patients (25%) had moderate and eight patients (40%) had heavy bleeding, and seven patients (35%) had very heavy bleeding before the procedure.

After the procedure, only four patients (20%) said that they had heavy or very heavy bleeding, whereas 13 patients (65%) had moderate bleeding, and three patients (15%) had light bleeding in the office hysteroscopy group. In the D&C group, six patients (30%) had heavy or very heavy bleeding after the procedure, nine patients (45%) had moderate bleeding, and three patients (15%) had light bleeding. There was a statistically significant improvement in the perception of blood loss in both groups. There was no difference between the two groups before the procedure; however, after the procedure, the improvement was more significant in the office hysteroscopy group when compared to the D&C group ($p < 0.001$).

There was a significant decrease in the number of women who thought that they were limited in work inside or outside the home by their bleeding in the office hysteroscopy group before and after the procedure, and this difference was statistically significant when compared with the D&C group. Similarly, there was a significant decrease in the number of women limited in their physical and social activities in the office hysteroscopy group after the procedure and this was significantly different from the D&C group (Table 3).

In the assessment of change in blood loss compared with the previous menstrual period, five patients thought that the bleeding was the same and 15 patients thought that the bleeding was better. In the D&C group, seven patients thought that the bleeding was the same and 12 patients thought that the bleeding was worse than before. Although

Table 3. — *Comparison of menorrhagia impact questionnaire scores: preoperative and postoperative third month.*

	Office hysteroscopy n (%)			Dilatation &curettage n (%)				
	Before	After	p_1	Before	After	p_2	p_{before}	p_{after}
Perception of the amount of blood loss								
Light	0 (0)	3 (15)	0.000	0 (0)	3 (15)	0.000	0.07	*0.001*
Moderate	5 (25)	13 (65)		5 (25)	9 (45)			
Heavy	8 (40)	3 (15)		8 (40)	4 (20)			
Very heavy	7 (35)	1 (5)		7 (35)	2 (10)			
Limitations in work inside or outside the home								
Not at all	2 (10)	7 (35)	0.000	1 (5)	5 (25)	0.001	0.23	*0.004*
Slight	1 (5)	8 (40)		3 (15)	4 (20)			
Moderate	8 (40)	3 (15)		6 (30)	5 (25)			
Quite a bit	8 (40)	1 (5)		8 (40)	5 (25)			
Extreme	1 (5)	1 (5)		0 (0)	2 (10)			
Limitations in physical activity								
Not at all	1 (5)	8 (40)	0.000	1 (5)	4 (20)	0.003	0.50	*0.004*
Slight	5 (25)	5 (25)		1 (5)	4 (20)			
Moderate	4 (20)	5 (25)		9 (45)	2 (10)			
Quite a bit	9 (45)	2 (10)		8 (40)	5 (25)			
Extreme	1 (5)	0 (0)		0 (0)	2 (10)			
Limitations in social and leisure activities								
Not at all	1 (5)	9 (45)	0.000	1 (5)	4 (20)	0.009	0.34	*0.002*
Slight	5 (25)	5 (25)		1 (5)	4 (20)			
Moderate	5 (25)	4 (20)		9 (45)	6 (30)			
Quite a bit	4 (20)	2 (10)		7 (35)	4 (20)			
Extreme	5 (25)	0 (0)		2 (10)	2 (10)			
Global assessment of change in blood loss								
Same	2	5	0.000	2	7	0.086	0.80	*0.017*
Better Almost the same		1						
A little better								
Somewhat better		5			1			
An average amount better		4						
A good deal better								
A great deal better		3						
A very great deal better		2						
Worse Almost the same, hardly	2			4	2			
A little worse	2			2	4			
Somewhat worse					2			
An average worse								
A good deal worse	5							
A great deal worse	1			2	1			
A very great deal worse	8			10	3			
Meaningfulness of perceived change in blood loss								
Yes	20 (100)	20 (100)		18 (90)	19 (95)			
No	0	0		2 (10)	1 (5)			

the difference in the office hysteroscopy group before and after the procedure was remarkable, it was not statistically significant. However, the difference between the two groups after the procedure was statistically significant. When the patients were asked if this was a meaningful or important change, 20 patients (100%) in the office hysteroscopy group and 19 patients (95%) in the D&C group suggested that it was an important change.

When the hemoglobin levels after the procedure was evaluated, it was observed that there was an increase in the hemoglobin levels in both groups (Table 2), but the increase was greater in the office hysteroscopy group when compared to the D&C group.

The pathology results of the two groups are summarized in Table 4. Eight patients had estrogenic effect in the endometrium in the D&C group and six patients had estrogenic effect in the endometrium in the office hysteroscopy group. One patient in each group had simple endometrial hyperplasia. Two patients in each group had progesterone effect in the endometrium. Eight patients in the office hysteroscopy group and three patients in the D&C group had endometrial polyps. One patient in the office hysteroscopy group and three patients in the D&C group had hypoestrogenic effect. Two patients in each group had insufficient tissue for diagnosis. In one patient in the D&C group, the endometrial pathology result was submucous leiomyoma.

Table 4. — *Pathological results of the endometrial samplings.*

	Office hysteroscopy n (%)	Dilatation & curettage n (%)	Total n (%)
Hyperestrogenic effect, proliferative endometrium	0 (0)	5 (25)	5 (12.5)
Hypoestrogenic effect	1 (5)	3 (15)	4 (10)
Progesterone effect	2 (10)	2 (10)	4 (10)
Adenofibromatous endometrial polyp	4 (20)	2 (10)	6 (15)
Hormonal dysfunction related to estrogen effect	6 (30)	3 (15)	9 (22.5)
Insufficient tissue for diagnosis	2 (10)	2 (10)	4 (10)
Simple hyperplasia without atypia	1 (5)	1 (5)	2 (5)
Endometrial polyp	4 (20)	1 (5)	5 (12.5)
Submucous leiomyoma parts	0 (0)	1 (5)	1 (2.5)

Discussion

Menorrhagia or heavy menstrual bleeding causes excessive blood loss and has an adverse effect on women's social, physical, and emotional quality of life [9-11]. Although menorrhagia is traditionally defined as menstrual bleeding greater than 80 ml [9], only about half of women seeking treatment meet this criterion in trials and there is heterogeneity among studies in regard to blood loss [12, 13]. Clinical guidelines now recommend the use of quality of life measures rather than menstrual blood loss in order to determine the effect of heavy bleeding on a woman's psychological and physical well-being [14].

FIGO working group has recommended that endometrial sampling should be performed in patients with abnormal uterine bleeding who are older than 45 years and in patients younger than 45 years with a history of unopposed estrogen exposure, failed medical management, and persistent bleeding [4]. Endometrial sampling may be performed by suction catheters, D&C, and hysteroscopy. Office hysteroscopy is the gold standard in the diagnosis of uterine cavity pathologies with high sensitivity and specificity and a low complication rate [15-16]. Cooper *et al.*, in their study using two clinically informed decision-analytic models, suggested that office hysteroscopy appears to be the optimal first-line diagnostic test used for the investigation of women presenting with menorrhagia wishing to preserve their fertility or refractory to previous medical treatment [17].

Nonetheless, hysteroscopy is often considered a painful procedure that is poorly tolerated by patients [5], with difficulties in reaching the uterine cavity [18]. However, in the present study, mean visual analogue scale result for pain was very low in the office hysteroscopy group and there was a significant difference when compared with the D&C group. In another study comparing office hysteroscopy with D&C, the mean visual analogue scale scores were 4.7 and 5 in the office hysteroscopy and D&C groups, respectively [19, 20].

The mean number of deliveries was significantly lower in the office hysteroscopy in the present study. This actually could have been associated with higher magnitude of pain during cervical dilatation stage of the office hysteroscopy; however the mean VAS score was significantly lower in the office hysteroscopy group despite this difference.

Heavy menstrual bleeding is a common cause of iron deficiency anemia [21]. Several studies have reported reduction not only in physical performance, but also in cognitive function, mood, and health-related quality of life among iron-deficient reproductive age women [22]. It was shown that health-related quality of life increased in iron deficient women after treatment for menorrhagia when compared to non-iron deficient women [22]. In the present study, the hemoglobin level was low in both groups before the procedure and there was an increase in the levels in both groups after the procedure. However, the increase was more evident in the office hysteroscopy group, which also correlates with the significant improvement in the quality of life of this group.

When the MIQ scores were analyzed, a significant improvement and change were observed in the hysteroscopy group when compared to the D&C group. In the perception of blood loss, the majority of the patients in the office hysteroscopy group thought that the amount of blood loss was mild or moderate. There was a significant difference when compared with the pre-procedure results and with the D&C group. There was a significant decrease in the number of women who thought that they were limited in work inside or outside the home by their bleeding in the office hysteroscopy group before and after the procedure and this difference was statistically significant when compared with the D&C group. Similarly, there was a significant decrease in the number of women limited in their physical and social activities in the office hysteroscopy group after the procedure and this was significantly different from the D&C group. It can be concluded that office hysteroscopy had a more positive effect on quality of life of patients suffering from menorrhagia when compared with D&C. Improvement in quality of life of women treated for heavy menstrual bleeding should be an essential part of heavy menstrual bleeding treatment [23]. Office hysteroscopy patients had less restriction in social and physical activities and returned earlier to daily activities when compared with the D&C group. This resulted in a considerable improvement in patient comfort.

When the pathology results were evaluated, there was a significantly higher number of patients diagnosed with endometrial polyps in the office hysteroscopy group. None of the patients had focal intracavitary pathologies diagnosed during ultrasound scan, but eight of the patients in the office hysteroscopy group and three of the patients in the D&C group had endometrial polyps. One patient in the D&C group had submucous leiomyoma parts in the endometrial sampling, which could have been diagnosed easily during office hysteroscopy. Two of the patients in each

group had insufficient tissue for diagnosis, probably due to excessive thinning of the endometrium.

Soguktas *et al.* investigated the diagnostic effectiveness of transvaginal sonography, saline infusion sonohysterography, and diagnostic hysteroscopy in women complaining with abnormal uterine bleeding in premenopausal period. They found that hysteroscopy allows more accurate diagnosis and also treats intrauterine pathology at the same intervention [24].

Both D&C and office hysteroscopy have been found to be effective in diagnosis of endometrial cancer in a study of Li *et al.* Hysteroscopy is particularly stated superior in terms of assessment of cervical involvement. Also it is emphasized that hysteroscopy does not lead to positive peritoneal cytology [25]. The present authors conclude that hysteroscopy gives a very high rate of accurate diagnosis of endometrial diseases.

Conclusion

In conclusion, office hysteroscopy is a minimally invasive procedure with high patient satisfaction and positive effect on blood loss. There is a significant patient-reported improvement in menorrhagia and positive effect on quality of life after office hysteroscopy when compared to D&C. VAS results for pain were significantly less in the office hysteroscopy when compared to D&C, even in patients with lower number of deliveries. Office hysteroscopy is superior to D&C in the diagnosis of intracavitary pathologies. More patients are diagnosed with endometrial polyps in the office hysteroscopy group even when the transvaginal ultrasound scan is negative for endometrial polyps. Rarely, endometrial tissue obtained during both procedures may be insufficient, but in this case thorough evaluation of the uterine cavity with office hysteroscopy would be more reassuring for the clinician.

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Corresponding Author:
M.K. EKEN, M.D.
Zeynep Kamil Educational and Research Hospital
Obstetric and Gynaecology Department
Op. Dr. Burhanettin Üstünel Caddesi No: 10 Üsküdar
Istanbul (Turkey)
e-mail: meryemkurek@yahoo.com