

Reliability of out-patient hysteroscopy in one-stop clinic for abnormal uterine bleeding

Atef M. Darwish · Ezzat H. Sayed ·
Safwat A. Mohammad · Ibraheem I. Mohammad ·
Hoida I. Hassan

Received: 3 January 2012 / Accepted: 30 January 2012 / Published online: 18 February 2012
© Springer-Verlag 2012

Abstract This study aims to estimate the effect of adding office hysteroscopy to the preoperative diagnostic work-up in abnormal uterine bleeding on the diagnostic accuracy. It is a prospective comparative diagnostic trial at a tertiary care referral facility and a university hospital. There were a total of 295 patients, more than 35 years old, with abnormal uterine bleeding. The patients had vaginal sonography, office hysteroscopy, and office endometrial biopsy on one-stop bases. The diagnostic accuracy of each method in diagnosing focal lesion and endometrial hyperplasia was measured as the main outcome of this paper. Combined hysteroscopy and biopsy were taken as the gold standard for diagnosing focal lesion while endometrial biopsy alone was the gold standard for diagnosing endometrial hyperplasia. Office hysteroscopy was superior to other methods for diagnosing focal lesion with about half of the focal lesions failing to be diagnosed with the other two methods. Office hysteroscopy was superior to vaginal sonography in diagnosing endometrial hyperplasia. Office hysteroscopy is an indispensable tool for diagnosing abnormal uterine bleeding and without its use, half of the focal lesions could be missed. Office setting and the one-stop approach greatly facilitate the use of the combination of office hysteroscopy with vaginal sonography and office endometrial sample.

Keywords Office hysteroscopy · Uterine bleeding · Ultrasonography · Biopsy

Introduction

Abnormal uterine bleeding (AUB) is any vaginal bleeding unrelated to normal menstruation and represents a major gynecological problem in about 20% of all gynecological referrals [1]. Anatomic and histologic causes predominate after the age of 35 years which made the American College of Obstetrics and Gynecology recommend endometrial biopsy as a part of investigating any woman with AUB above 35 years and sometimes earlier if there is a risk factor [2]. In addition to a careful clinical examination, the traditional approach for diagnosis of AUB comprises both transabdominal ultrasonography (TAS) and transvaginal ultrasonography (TVS), and endometrial sampling. Ultrasonography, especially TVS, is generally accepted as an initial investigation of these patients as it is well tolerated, least invasive, easy to do, and gives idea about the uterine anatomy (the wall and the lining) and the adnexa with little cost. These diagnostic tools share some common disadvantages in the form of failure to diagnose minute causes that are not commonly seen, to localize the exact site of the lesion causing bleeding, to define its relationship to tubal ostia specially in infertile women and lastly to guide biopsy aid. For cavity disorders, hysteroscopy is the gold standard for diagnosis of AUB which is widely performed as office hysteroscopy (OH) procedure with the possibility of see and treat in the setting. OH is a well-tolerated procedure and equally accepted as hysteroscopy under general anesthesia [3]. There is no consensus however that OH should be included in the initial evaluation of patients with AUB or be restricted to those with abnormalities at TVS. This study

A. M. Darwish (✉) · E. H. Sayed · S. A. Mohammad ·
I. I. Mohammad
Department of Obstetrics and Gynecology,
Woman's Health University Hospital,
71111 Assiut, P.O. Box: (1) Assiut, Egypt
e-mail: atef_darwish@yahoo.com

H. I. Hassan
Department of Pathology, Faculty of Medicine, Assiut University,
Assiut, Egypt



Fig. 1 Transvaginal sonohysterographic appearance of an endometrial polyp

aims to estimate the effect of adding OH to the preoperative diagnostic work-up in AUB on the diagnostic accuracy.

Materials and methods

After obtaining the acceptance of the ethics committee of the Assiut Faculty of Medicine, this study was conducted in the outpatient hysteroscopy unit of Woman's Health University Hospital from August 2006 to May 2011. It included women with AUB of 35 years or older. Exclusion criteria included suspected pregnancy, active pelvic infection, severe comorbidity, e.g., severe cardiac, neurologic, or chest disease, recent initiation of contraception in the previous 3 months, or cervical neoplasm. The patients were examined at the day of presentation on one-stop bases irrespective of the day of the cycle. All patients had clear description of the study and were asked to participate. An informed consent was taken from those who agreed.

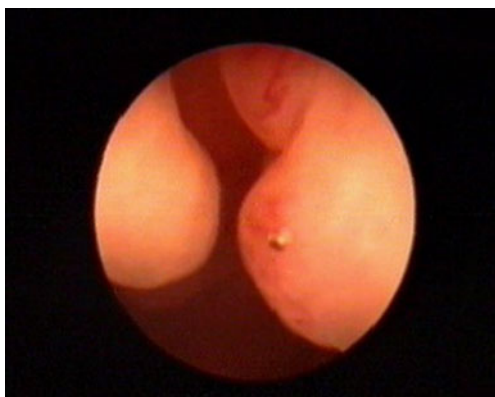


Fig. 2 Kissing endometrial polyp

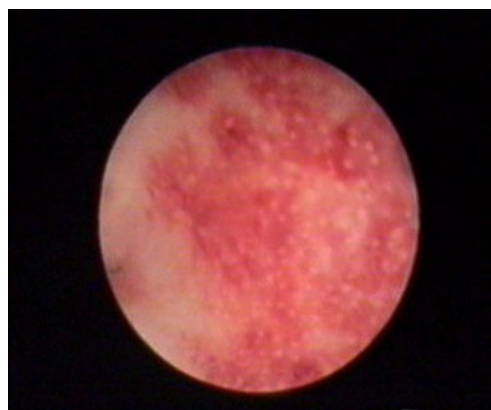


Fig. 3 Strawberry appearance of the congested endometrium

The included patients were subjected to complete history taking and meticulous physical examination. Both TAS and TVS were thereafter performed using a Medison 128 BW machine (MEDISON COR, South Korea). The uterus was examined in the sagittal and coronal views for endometrial thickness, focal cavity or intramural masse(s), evidence of adenomyosis uteri [4], or adnexal mass(s).

The endometrium was considered thick when it was 5 mm or more in postmenopausal patients and in premenopausal patients of 8 mm or more and 10 mm or more cutoff levels was tested. Because it was not possible in all cases to clearly discriminate between polyp and submucous myoma, focal lesion was used to describe either of them. Abnormal endometrium was used to describe endometrial line with which was either thick and/or shows signs of focal lesion. In case of suspicious diagnosis when TVS could not exactly differentiate intracavitary from intramural lesions, a quick office sonohysterography was performed according to our simplified technique [5] as shown in Fig. 1. TVS was performed by an ultrasonography team but sonohysterography was performed by the first author.

OH was done using posterior wall Sims' speculum to expose the cervix where the anterior lip is grasped with



Fig. 4 Telangiectatic vessel of the endometrium

Fig. 5 Office sampling

single-toothed tenaculum without any premedication or local anesthesia. We used 2.9° mm 30° rigid scope with 4 mm single flow sheath (Promis, Germany) and the uterus was distended with normal saline at 100 mmHg generated from a pneumatic cuff of sphygmomanometer. We used 250-W halogen light source for the video OH. The scope was introduced gently through the cervical canal without previous dilatation using the saline to expand the way in front of the scope. The cervical canal was examined for polypi, Nabothian cysts, or micropolypi suggestive of chronic cervicitis. The uterine cavity was examined systematically (panoramic view) starting by its anterior and posterior walls; the fundus, and the borders and examination was considered complete if the both tubal ostia were reached describing any gross pathology, e.g., polyp, myoma, growth, etc. (Fig. 2).

Focused OH was then performed to describe endometrial appearance (atrophic, normal thick, papillary, suspicious of atypical hyperplasia or cancer), vasculature (normal, congestion, petechiae, ecchymosis, or abnormal suspicious vascular pattern), and color (whitish, pink, reddish, or dark red; Figs. 3 and 4). The scope was finally gradually withdrawn with confirmation of previous findings. Then a 5-mm uterine curette or a 4-mm Novak curette with suction was introduced in multiparous uterus or nulliparous uterus, respectively, for endometrial biopsy (office sample, OS) from the anterior and/or the posterior walls of the uterus just below the fundus and directed towards any suspicious area previously defined on hysteroscopic examination (Fig. 5).

The statistical analysis was done using SPSS 16 program. Categorical data were described as percentages and

Table 1 Characteristics of the study patients

	Global	35–40	40 or more	Menopausal	Sig.
Mean age (years)	45.3 (7.9)	36.4 (1.5)	45.6 (4.2)	55.6 (8.3)	NA
Parity	6.3 (3.1)	4.7 (2.2)	6.6 (3)	7.6 (3.3)	0.000
Abortions	1.3 (1.5)	0.9 (1.2)	1.4 (1.6)	1.3 (1.5)	0.06
Nulliparity	3.1%	4.3%	2.9%	1.8%	0.72
Contraceptive use	21% ^a	30%	17%	NA	0.04 ^a
Progestin treatment	37%	37%	39%	31%	0.5
Previous D&C	31%	27%	36%	20%	0.051
Hypertension	18.6%	4.3%	19.4%	35%	0.000
DM	10%	4.3%	8.2%	22%	0.003
BMI	30.6 (6.3)	28.4 (6)	30.7 (5.7)	33 (7.4)	0.000
Obesity(BMI>=30)	51%	37%	53%	62%	0.000

^aComparisons were made between premenopausal groups only.

NA Not applicable

Table 2 Transvaginal sonographic findings.

	Global	35–40	40 or more	Menopausal	Sig.
Endometrial thickness (mm)	10.9±5.7	9.7±5.2	10.3 (4.8)	14.2 (7.6)	0.000
8 mm or more	67%	59%	64%	87.3% ^b	0.001
10 mm or more	51%	34%	46%	87.3% ^b	0.000
Myometrial thickness (cm)	1.9 (0.5)	1.8 (0.4)	2 (0.5)	1.7 (0.4)	0.000
Signs of adenomyosis	41%	27%	52%	24%	0.000
Focal lesion	21%	16%	21%	29%	0.187
Abnormal endometrium 8 mm ^a	74%	67%	73%	87.3% ^b	0.032
Abnormal endometrium 10 mm	60%	43%	59%	87.3% ^b	0.000
Fibroid	17%	10%	21%	13%	0.072
Ovarian mass	6.4%	8.6%	5.9%	5.5%	0.81

^aEither thick endometrium or focal lesion

^bAt 5 mm cut off level

compared with chi square and exact Fischer tests. Continuous data were described as mean±SD or median (according to data distribution) and compared using *t* test, Man–Whitney test, and analysis of variance test with least significant difference post hoc test when appropriate. Correlation was used when appropriate. The diagnostic performance is calculated using 2×2 tables using EB as the gold standard for diagnosing hyperplasia or cancer and the combined hysteroscopy and biopsy for diagnosing focal lesion.

Results

The characteristics of the study patients are shown in Table 1. Only five cases (1.7%) had failed OH with success rate of (295/300) 98.3% while 15 cases had failed OS with success rate of (295/310) 95%. The results of TVS, OH, and EB examinations are summarized in Tables 2, 3, and 4. Abnormal findings tended to increase with age with more prevalence of precancerous and cancerous lesions in the postmenopausal group.

Table 3 Office hysteroscopic findings

	Global	35–40	40 or more	Menopausal	Sig.
Appearance					
Atrophic	2%	1.4%	1.8%	3.6%	0.64
Normal	58.3%	66%	59%	43.6%	0.02
Thick	32.5%	30%	33%	36.4%	0.62
Plypoid	4.4%	2.9%	5.3%	3.6%	0.67
Suspecious	2.7%	0%	0.6%	13%	0.000
Vasculature					
Normal	24%	21%	25%	22%	0.76
Congestion	41%	47%	37%	47%	0.22
Petechiae and Ecchymosis	29%	30%	33.5%	16%	0.052
Abnormalvessles	5.4%	1.4%	4.1%	15%	0.003
Polyp	15%	5.7%	14%	29%	0.001
Submucous myomas	13%	5.7%	16%	12.7%	0.1
Either	25%	11.4%	26%	40%	0.001
Abnormal hysteroscopy	55%	39%	56%	71%	0.001
Blood clots	17.3%	24.3%	14%	18%	0.163
Adhesions	3.7%	2.9%	4.7%	1.8%	0.56
Access to tubal ostia					
Both	77.3%	87%	76.5%	67.3%	0.097
One	10.5%	7.1%	11.1%	12.75	0.097
Neither	12.2%	5.7%	12.4%	20%	0.097
Fluid volume (cc)	311 (115)	309 (133)	309 (107)	320 (116)	0.828

Table 4 Results of endometrial biopsy

	Global (%)	35–40 (%)	40 or more (%)	Menopausal (%)	Sig.
Insufficient	2.4	2.9	2.9	0	0.439
Proliferative	35.4	41.4	38.8	18.2	0.005
Secretory	13	21.4	12.4	5.5	0.029
Simple hyperplasia	34.2	24.3	35.3	43.6	0.045
Atypical hyperplasia	3.4	1.4	1.8	10.9	0.003
Cancer	1.4	0	0	7.3	0.000
Others					
Atrophy	4	2.9	3.5	5.4	0.732
Endometritis	2	1.4	1.8	3.6	0.169
TB endometritis	0.7	1.4	0.6	0	0.342
Polyp	2.4	1.4	1.2	5.5	0.03
Submucous myoma	2.4	1.4	2.9	3.6	0.274
Remnants of conception	1.4	2.9	1.2	0	0.372
Menstruating	0.3	0	0.6	0	0.23

The diagnostic performance of the different methods in for either focal lesion or hyperplasia and cancer is shown in Table 5. OH showed better accuracy and agreement with histologic diagnosis of hyperplasia or cancer with larger area under the curve (AUC). It was much better than VUS and EB in diagnosing focal lesions with much better accuracy and agreement and larger AUC. The patient response to every procedure together with physician satisfaction is summarized in Table 6.

Discussion

Thanks for the development in optics that allowed the use of small caliber instruments that could pass through the cervix

Table 6 Patient and physician satisfaction with the different procedures

	TVS	OH	EB	Sig.
Duration (min)	3.47 (0.78)	3.6 (0.97)	2.14 (0.33)	0.000
Pain score	1.4 (0.5)	3.25 (0.8)	4.67 (1)	0.000
Patient acceptance				
Easy	85.1%	23.1%	2.7%	0.000
Fair	14.6%	61.7%	39.7%	0.000
With difficulty	0.3%	15.3%	48.5%	0.000
Not accepted	0%	0%	4.1%	0.000
Not at all	0%	0%	0.3%	0.000
The procedure				
Easy	95%	44.1%	14%	0.000
Uncomfortable	5%	37.3%	23.4%	0.000
Painful	0%	18.6%	62.7%	0.000
Vagal reaction	0%	1.7%	5.4%	0.01
Physician satisfaction	9.7 (0.5)	9.6 (0.9)	NA	0.8

without the need of dilatation. This allowed the use of hysteroscopy in the office in a one-stop setting where all the investigations needed could be done at the time of presentation with the possibility of see-and-treat policy [6]. The addition of office hysteroscopy to vaginal sonography in the initial evaluation of abnormal uterine bleeding was associated with decrease number of visits with shorter duration to diagnosis [7]. In a qualitative trial, most women preferred office hysteroscopy for varying reasons as they could cope without anesthesia, dislike of general anesthesia, do not like to wait, or do not like to be admitted to hospital [8].

This study was performed by the conventional OH; but nowadays, we perform all OH with the vaginoscopic approach which seems less painful and well tolerated by the patients. Nevertheless, in this study, we did not use any pre

Table 5 Diagnostic performance of different methods in diagnosing hyperplasia and focal lesions

	SN%	SP%	PPV%	NPV%	DA%	PLR	NLR	Kap.	AUC
Focal lesion									
Focal lesion at US	42	87	55	80	75	3.2	0.67	0.31	0.65
Abnormal US 8 mm	85	30	32	84	45	1.2	0.5	0.1	0.574
Abnormal US 10 mm	81	47	37	87	57	1.5	0.4	0.21	0.643
OH myoma or polyp	91	100	100	97	98	91	0.09	0.94	0.96
EB	17	100	100	69	78	17	0.83	0.24	0.59
Hyperplasia and cancer									
Thick end. 8 mm	82	42	48	78	58	1.4	0.43	0.22	0.612
Thick end 10 mm	74	63	56	79	67	2	0.41	0.36	0.674
OH thick or suspicious endometrium	76	83	75	84	80	4.5	0.29	0.6	0.77
Abnormal OH	85	65	61	87	73	2.4	0.23	0.47	0.73

or intraprocedure analgesia or anesthesia as most studies suggests that OH in experienced hands is a well-tolerated technique and requires the use of analgesics only in selected patients [9]. Office hysteroscopy was well tolerated by our patients with mean pain score of 3.25 ± 0.8 which is comparable to previous studies with a range of 3–4.8 with variable caliber of the hysteroscopes used [10–14]. The procedure also has high patient acceptance with 85% of patients had easy or faire acceptance and in the other 15% it was accepted with some difficulty. The corresponding figures were 88.7% and 83% with others [11, 13]. The addition of office hysteroscopy to the initial evaluation was associated with decrease number of visits. Our results are intermediate in comparison to previous trials regarding hysteroscopic diagnosis of endometrial hyperplasia with 80% diagnostic accuracy. Some trials had low-diagnostic accuracy of 59% [15], others had comparable accuracy of 73% [16], 79% [17], and 81% [18] while others had higher accuracy of 90% [19] or 96% [20]. This could be explained partially by difference in patient population as Loizzi et al. [21] had a sensitivity of 100% in a population of postmenopausal women with bleeding and thick endometrium. It was found that combining endometrial biopsy and finding of focal lesion in vaginal sonography missed about 50% of focal lesions in our trial. Vaginal sonography had 42% sensitivity in detecting focal lesions. Previous studies had very wide range of sensitivity ranging from 12% to 86% [22, 23], with many of them having very near figures to our study ranging from 39% to 50% [24, 25]. This was also the case for endometrial biopsy which detected only 17% of focal lesions and this also was comparable to previous trials with detection rate varying from 11% to 19% [19, 26].

Considering low-resource countries like Egypt with high parity and consequently very high load of obstetric cases (the average rate of deliveries in our hospital is 18,000 per year), it is crucial to decrease the inpatient case load with adopting policies like one-stop outpatient service. This also much decrease the costs associated with the inpatient service.

In conclusion, the addition of office hysteroscopy in initial evaluation of women with abnormal uterine bleeding appears very beneficial as it allows complete diagnosis in fewer visits within shorter duration with the possibility of see-and-treat action and subsequently saving of the inpatient hospital resources especially in low-resource high-load countries. Regarding endometrial pathology, if performed alone, OH is superior to TVS in all diagnostic indices except being less sensitive. If combined with TVS, OH improves all diagnostic indices. As regards intrauterine lesions, OH is superior to TVS, OS, and even histopathology in detection of IU lesions. Future research should focus on comparing the diagnostic accuracy of OH to 4-D ultrasonography or MRI.

References

- Collins S, Arulkumeran S, Hayes K, et al. eds. (2008) Normal menstruation and its disorders. In: Oxford handbook of obstetrics and gynecology. Oxford, OUP, 483–500
- ACOG (2002) Guidelines for women's health care, 2nd edn. ACOG, Washington
- Kremer C, Duffy S, Moroney M (2000) Patient satisfaction with outpatient hysteroscopy versus day case hysteroscopy: randomized controlled trial. *BMJ* 320:279–282
- Darwish AM, Makhlof AM, Youssef AA, Gadalla HA (1999) Hysteroscopic myometrial biopsy in unexplained abnormal uterine bleeding. *Eur J Obstet Gynecol Reprod Biol* 86(2):139–143
- Darwish AM, Youssef AA (1999) Screening sonohysterography in infertility. *Gynecol Obstet Invest* 48(1):43–47
- Siristatidis C, Chrelias C (2011) Feasibility of office hysteroscopy through the “see and treat technique” in private practice: a prospective observational study. *Arch Gynecol Obstet* 283(4):819–823
- Böttcher B, Brown VA (2002) Postmenopausal bleeding: management by transvaginal ultrasound scan or outpatient hysteroscopy? *Gynaecol Endosc* 11:245–249
- Morgan M, Dodds W, Wolfe Ch, Raju S (2004) Women's views and experiences of outpatient hysteroscopy: implications for a patient-centered service. *Nurs Heal Sci* 6:315–320
- Cicinelli E (2010) Hysteroscopy without anesthesia: review of recent literature. *J Minim Invasive Gynecol* 17(6):703–708
- Diniz DB, Depes Dde B, Pereira AM, David SD, Lippi UG, Baracat FF, Lopes RG (2010) Pain evaluation in office hysteroscopy: comparison of two techniques. *Rev Bras Ginecol Obstet* 32(1):26–32
- McIlwaine K, Readman E, Cameron M, Maher P (2009) Outpatient hysteroscopy: factors influencing post-procedure acceptability in patients attending a tertiary referral centre. *Aust N Z J Obstet Gynaecol* 49(6):650–652
- van Dongen H, de Kroon CD, van den Tillaart SA, Louwé LA, Trimbos-Kemper GC, Jansen FW (2008) A randomised comparison of vaginoscopic office hysteroscopy and saline infusion sonography: a patient compliance study. *BJOG* 115(10):1232–1237
- Van den Bosch T, Verguts J, Daemen A, Gevaert O, Domali E, Claerhout F, Vandenbroucke V, De Moor B, Deprest J, Timmerman D (2008) Pain experienced during transvaginal ultrasound, saline contrast sonohysterography, hysteroscopy and office sampling: a comparative study. *Ultrasound Obstet Gynecol* 31(3):346–351
- Cordeiro A, Condeço R, Leitão C, Sousa F, Coutinho S, Docarmosilva M, Bernardo MJ, Mira R (2009) Office hysteroscopy after ultrasonographic diagnosis of thickened endometrium in postmenopausal patients. *Gynecol Surg* 6:317–322
- Ekin M, Karayalçın R, Özcan S, Özcan U (2007) Transvaginal ultrasonography and office hysteroscopic findings and their histopathologic correlation in asymptomatic and symptomatic postmenopausal women. *Med J Bakirköy* 3:2
- Lasmar RB, Barrozo PR, de Oliveira MA, Coutinho ES, Dias R (2006) Validation of hysteroscopic view in cases of endometrial hyperplasia and cancer in patients with abnormal uterine bleeding. *J Minim Invasive Gynecol* 13(5):409–412
- Wang CJ, Mu WC, Yuen LT, Yen CF, Soong YK, Lee CL (2007) Flexible outpatient hysterofibroscopy without anesthesia: a feasible and valid procedure. *Chang Gung Med J* 30(3):256–262

18. Paschopoulos M, Lolis ED, Alamanos Y, Koliopoulos G, Paraskevaidis E (2001) Vaginoscopic hysteroscopy and transvaginal sonography in the evaluation of patients with abnormal uterine bleeding. *J Am Assoc Gynecol Laparosc* 8(4):506–510
19. Angioni S, Lodo A, Milano F, Piras B, Minerba L, Melis GB (2008) Detection of benign intracavitary lesions in postmenopausal women with abnormal uterine bleeding: a prospective comparative study on outpatient hysteroscopy and blind biopsy. *J Minim Invasive Gynecol* 15(1):87–91
20. Ceci O, Bettocchi S, Pellegrino A, Impedovo L, Di Venere R, Pansini N (2002) Comparison of hysteroscopic and hysterectomy findings for assessing the diagnostic accuracy of office hysteroscopy. *Fertil Steril* 78(3):628–631
21. Loizzi V, Bettocchi S, Vimercati A, Ceci O, Rossi C, Marelli F, Greco P (2000) Hysteroscopic evaluation of menopausal women with endometrial thickness of 4 mm or more. *J Am Assoc Gynecol Laparosc* 7(2):191–195
22. Timmermans A, Gerritse MB, Opmeer BC, Jansen FW, Mol BW, Veersema S (2008) Diagnostic accuracy of endometrial thickness to exclude polyps in women with postmenopausal bleeding. *J Clin Ultrasound* 36(5):286–290
23. Georgantopoulou C, Simm A, Roberts M (2008) Transvaginal saline hysterosonography: a comparison with local anaesthetic hysteroscopy for the diagnosis of benign lesions associated with menorrhagia. *Gynecol Surg* 5:27–34
24. Pasqualotto EB, Margossian H, Price LL, Bradley LD (2000) Accuracy of preoperative diagnostic tools and outcome of hysteroscopic management of menstrual dysfunction. *J Am Assoc Gynecol Laparosc* 7(2):201–209
25. Mukhopadhyay S, Bhattacharyya SK, Ganguly RP, Patra KK, Bhattacharya N, Barman SC (2007) Comparative evaluation of perimenopausal abnormal uterine bleeding by transvaginal sonography, hysteroscopy and endometrial biopsy. *J Indian Med Assoc* 105(11):624, 626, 628
26. Verrotti C, Benassi G, Caforio E, Nardelli GB (2008) Targeted and tailored diagnostic strategies in women with perimenopausal bleeding: advantages of the sonohysterographic approach. *Acta Biomed* 79(2):133–136