

The use of different size-hysteroscope in office hysteroscopy: our experience

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Abstract

Purpose To evaluate the successful rate and patient acceptance of different-sized hysteroscope in office hysteroscopy.

Methods We retrospectively evaluated 900 office hysteroscopy performed in ambulatory setting using three different hysteroscopes: 5 mm Hamou II ($n = 300$), 5 mm Bettocchi ($n = 300$) and 4 mm Bettocchi ($n = 300$). Endpoints of our study were the successful rate of hysteroscopy, the eventual side effects/complication and the pain intensity experience from the patients using visual analog scale (VAS).

Results Use of 4 mm Bettocchi leads to a higher rate of successfully performed hysteroscopy (99 %, $n = 297$) and statistically significant when compared to the 5 mm Hamou (95 %, $n = 285$) and to the 5 mm Bettocchi (96 %, $n = 288$) (4 mm Bettocchi vs. 5 mm Bettocchi $p < 0.05$; 4 mm Bettocchi vs. 5 mm Hamou II $p < 0.001$; 5 mm Bettocchi vs. 5 mm Hamou II ns). Moreover, the VAS score was higher using 5 mm Hamou II (5.72 ± 1.99) and statistically significant when compared to the 4 mm Bettocchi (3.06 ± 2.14) and to the 5 mm Bettocchi

(4.27 ± 1.88) (A vs. B $p < 0.05$; A vs. C $p < 0.001$; B vs. C $p < 0.001$).

Conclusions Our result suggests that the hysteroscope size plays a pivotal role in the acceptance and for the success of office hysteroscopy.

Keywords Hysteroscopy · Office procedure · Hysteroscope size · Pain

Introduction

Office (or ambulatory) hysteroscopy is a widely used endoscopic method, the “gold standard” for the examination of uterine cavity changes. Moreover, office hysteroscopy has important advantages when compared to hysteroscopy performed with local or total anesthesia such as the increased patient acceptance, the decrease of anesthetic-associated risks and the time–cost effectiveness [1]. The traditional technique for diagnostic hysteroscopy was based on the use of 5-mm or larger hysteroscopes, speculum, tenaculum, in some case cervical dilators, and the use of carbon dioxide (CO₂) for uterine distention [2]. Hence, conventional hysteroscopy is therefore considered as an invasive and painful procedure, and it is not generally accepted as an ambulatory procedure [3, 4].

During the years several innovations have been adopted that might have a pivotal role in the acceptance as well as in the reduction of pain intensity during office hysteroscopy procedure [5]. Lowering the caliber of the instrument (mini hysteroscopes) is of great importance allowing a greater number of successful procedures and reducing the perceived pain and the risk of vagal reactions [2, 3, 6]. Moreover, the use of saline solution rather than CO₂ as distention medium [7, 8], the vaginoscopic approach (also

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know as the “no touch” technique) [4, 9] and eventually the use of flexible instruments [10] may have a role in pain intensity. In addition to technical factors, the operator expertise [1], the duration of the examination as well as uterine characteristics or abnormalities, and patient psychological characteristics also influence the perception of pain and the acceptability of the technique.

Despite all these changes guided by the growing experience of the clinician, it is well known that sometimes hysteroscopy cannot be performed due to the intensity of pain felt by women which might result in the occurrence of a vagal reaction [3, 11]. According to the international literature the percentage of impossibility to perform office hysteroscopy in ambulatory setting is reported to vary from 1.3 to 5.2 % [2].

In these cases, when the procedure is mandatory to assess a diagnosis, the physician suggests to repeat the hysteroscopy under local or general anesthesia. Indeed, for these patients a diagnosis of “uterine internal cervix stenosis” becomes the primary indication to transform a diagnostic hysteroscopy into a more complex and invasive procedure. The modern use of local anesthesia, performing a paracervical block, allows to complete the hysteroscopic procedures without resorting to general anesthesia [12]. The use of paracervical block is more and more popular even if it often requires the anesthetist’s overlook to the procedure and an operative room setting. Moreover, when the general anesthesia is performed, the diagnostic hysteroscopy is also associated with a higher risk of complication occurrence as well as a higher cost for the procedure [1].

The purpose of the present study was to verify the incidence of “impossible diagnostic hysteroscopy” in our ambulatory using different instruments and different media; actually, we tried to ascertain both the real percentage of women who could not tolerate the office procedure without anesthesia and to establish if different hysteroscopic instrumentation might affect this percentage. For this aim, a total of 900 hysteroscopy performed in ambulatory setting of our Institute have been retrospectively analyzed.

Materials and methods

This study was conducted in the Institute of Gynecology of Università Cattolica del Sacro Cuore of Rome from January 2009 to August 2011.

A total of 900 hysteroscopies, performed in an ambulatory setting of our institute by one expert physician, have been retrospectively analyzed. Patients have provided written informed consent before the procedure. The present study was approved by the Institutional Review Board of

Università Cattolica del Sacro Cuore, Rome and there was no form of conflict of interest.

After a pelvic ultrasound evaluation, three different hysteroscopic instrumentations were used to perform the exam. Group A ($n = 300$): diagnostic hysteroscope 5-mm type Hamou II Karl-Storz; Group B ($n = 300$): 5-mm operative hysteroscope type Bettocchi Karl-Storz; Group C ($n = 300$): 4-mm operative hysteroscope type Bettocchi Karl-Storz.

To avoid inter-operator variability, all procedures were performed by the same surgeon and, for women of fertile age hysteroscopy was performed during the early follicular phase of the menstrual cycle. Exclusion criteria to perform hysteroscopy were mainly the presence of heavy bleeding, suspected pregnancy and/or suspected vaginal infection.

The characteristics of the patients as well as the indications of the procedure divided into the three groups are displayed in Table 1.

In Group A CO₂ was used as a distension medium at a pressure of 75–100 mmHg and hysteroscopy was performed with the help of the speculum. Conversely, in Group B and Group C all the hysteroscopies were performed using the vaginoscopic approach avoiding the use of the speculum. Moreover, saline solution (NaCl 0.9 %) was employed to distend the uterine cavity pumped at a similar pressure of CO₂ with the assistance of Stroz Hamou Endomat, which allows controlled and precise irrigation of uterine cavity. In all the hysteroscopy performed the use of tenaculum or cervical dilators was avoided.

The mean duration of the hysteroscope procedures ranged from 2 to 5 min.

All hysteroscopies were performed without any kind of anesthesia or pharmacological preparation of the patient.

No antibiotic administration was used before or after the procedure. Indeed, the risk of infection was reported as 0.79 % after hysteroscopy with CO₂ as distention medium [13], while no data exist today on the infective risks when the vaginoscopic approach and saline distention medium are used. Moreover, in a recent study Kasius et al. [14] concluded that considering the extremely low risk of infectious complications and the lack of evidence of a beneficial effect of antibiotic prophylaxis, its use for routine diagnostic office hysteroscopy should not be recommended.

Any occurred side effects of the hysteroscopic procedures such as vagal symptoms, lipothymia, severe hypotension, sweating, severe nausea and vomiting have been recorded.

The rate of successful introduction of the different hysteroscopes into the uterine cavity was obtained from the records usually reported in our Institute. In the present study only the hysteroscopy performed without the help of ancillary instruments was selected (absence of cervical

Table 1 Clinical characteristics of patients and indication for hysteroscopy

	A Group (5-mm Hamou II)	B Group (5-mm Bettocchi)	C Group (4-mm Bettocchi)
Patients (<i>n</i>)	300	300	300
Age (years)	48.15 ± 18.31	49.32 ± 19.25	50.02 ± 19.17
Age range (years)	18–74	20–73	19–75
Nulliparous	42 (14)	45 (15)	43 (14.33)
Cesarean section	39 (13)	41 (13.66)	43 (14.33)
Indications			
Abnormal uterine bleeding	126 (42)	130 (43.34)	128 (42.66)
Infertility/sterility	41 (13.66)	38 (12.66)	35 (11.66)
Cervical polyp	21 (7.02)	22 (7.34)	19 (6.34)
Suspected intrauterine outgrowth	72 (24)	71 (23.66)	73 (24.34)
Suspected uterine malformation	14 (4.66)	12 (4)	15 (5)
Control	26 (8.66)	27 (9)	30 (10)
Duration of procedure (min)	4 ± 0.3	3 ± 0.9	3 ± 0.7

Data in parentheses are percentage

stenosis) in order to avoid possible bias regarding the achievement of the uterine cavity.

To verify patient acceptability, the degree of discomfort that each patient experienced during the procedure was assessed soon after the end of the procedure (1–5 min) using visual analog scale (VAS) with a rating score of 0 (no discomfort) to 10 (severe discomfort), as previously described [15].

All analyses were performed by use of SPSS, v.16.0 software (SPSS, Inc., Florence, Italy). Assessment of homogeneity of variance was performed using Levene test (p value >0.05). Continuous variables were expressed as mean and standard deviation (mean ± SD); dichotomous variables were expressed as percentages. Continuous variables among the three groups of subjects in the study population were compared with an analysis of variance; categorical variables were compared using the Chi-square test or Fisher's exact test, as appropriate. Bonferroni or Dunn's correction for multiple comparisons was applied. $p < 0.05$ was considered statistically significant.

Results

As said, Table 1 shows the characteristics of all the enrolled patients divided into the three different groups. There were no statistical differences of age, parity, and indications for hysteroscopy, general health condition or menopausal status between the groups and the patients have been matched (see Table 1).

The rate of successful introduction of the hysteroscope in uterine cavity was 96.6 % (870 women of 900) and the findings of all hysteroscopic procedure are shown in Fig. 1.

As shown in Fig. 2, Group C has a higher rate of successfully performed hysteroscopy (99 %, $n = 297$) and

statistically significant when compared to the 5 mm Hamou (95 %, $n = 285$) and to the 5 mm Bettocchi (96 %, $n = 288$) (4 mm Bettocchi vs. 5 mm Bettocchi $p < 0.05$; 4 mm Bettocchi vs. 5 mm Hamou II $p < 0.001$; 5 mm Bettocchi vs. 5 mm Hamou II ns). Indeed, the failed hysteroscopy was 3 in Group C (1 %), 12 in Group B (4 %) and 15 in Group A (5 %).

In Fig. 3 is shown the pain score (VAS) reported after the procedure from the patients. In Group A the VAS score was 5.72 ± 1.99 , in Group B was 4.27 ± 1.88 while in Group C was 3.06 ± 2.14 (A vs. B $p < 0.05$; A vs. C $p < 0.001$; B vs. C $p < 0.001$).

The primary failure cause of the hysteroscopic procedure was the report of unbearable pain when passing through the cervical ostium. When patients complained severe pain after the examination they were treated with nonsteroidal anti-inflammatory drugs.

None of the women experienced severe complications or side effects during and soon after the procedure. We observed only a few cases of minimal or mild nausea and no severe vagal reaction was observed.

When office hysteroscopy could not be performed due to the intensity of pain as well as the presence of a stenosis the patient was requested to perform hysteroscopy in local or general anesthesia.

Discussion

In the present study we compared three different types of hysteroscopes on a large series of procedures ($n = 900$). Our data show that hysteroscopy performed with 4-mm Bettocchi hysteroscopes is more reliable and less painful than that with conventional 5-mm hysteroscopes both using CO₂ (Hamou II) or saline solution (Bettocchi) as distention

Fig. 1 Different diagnosis after all hysteroscopy procedures. Data are expressed as percentage of the total performed hysteroscopies ($n = 900$)

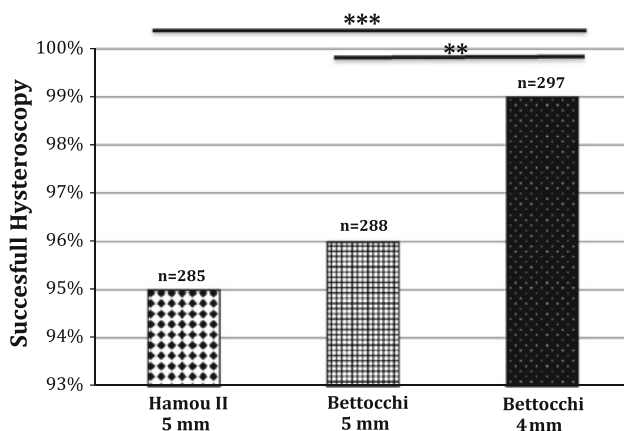
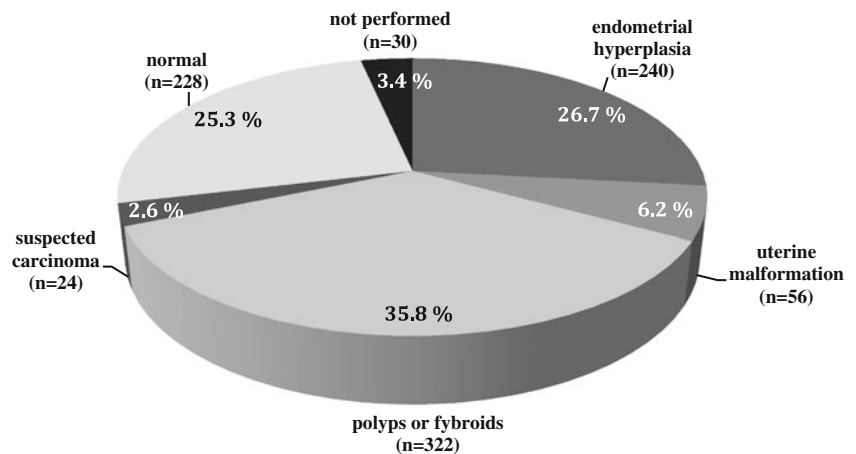


Fig. 2 Percentage of successful hysteroscopy with respect to the three different hysteroscope. Results are expressed as percentage of the total performed hysteroscopies with each hysteroscope. $**p < 0.01$; $***p < 0.001$

medium. Indeed, based on our experience and on the present results, the use of 4-mm Bettocchi hysteroscopes significantly reduces and almost abolishes the cases of failed introduction either due to external/internal cervical ostium stenosis or unbearable pain.

Our data are in agreement with the findings of Pulchino et al. [1], who stressed the pivotal aspect of the instrument size in the success rate of office hysteroscopy, when hysteroscopist experience is high, the latter being the primary key point for the patient's perception of pain during the procedure.

It is important to underline that the reduction in hysteroscope/telescope size did not impair the diagnostic accuracy of the examination as already reported in the literature [16]. Indeed, the number of satisfactory examinations was similar when 4-mm or the 5-mm hysteroscope was used.

In the present study we also investigated the acceptability of the hysteroscopy procedure by evaluating the VAS reported from the patients after the procedure. The

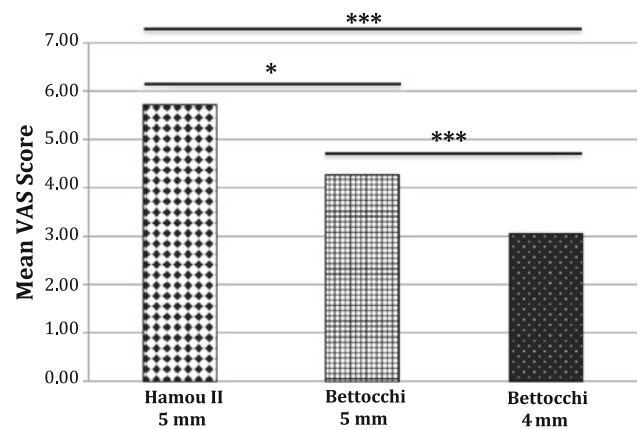


Fig. 3 Mean VAS scores between the three different hysteroscopes. Results are expressed as the mean of the VAS score reported after hysteroscopy within each hysteroscope group. $*p < .05$; $***p < .001$

score reported was significantly lower when the 4-mm Bettocchi hysteroscope was used with respect to both 5 mm Bettocchi as well as to 5 mm Hamou II. By evaluating data in the literature, we can state that pain scores during hysteroscopy were comparable to scores registered by other authors using the same size instrument [17]. Furthermore, we found a statistically significant difference in the VAS score between the use of 5 mm Bettocchi and the 5 mm Hamou II probably due to the different distension media used. Actually, several studies have confirmed that the use of a normal saline solution is more acceptable by the patients [7, 8] because the procedure is smoother, quicker to perform and without the irritant effects of CO₂ [3, 18]. Another possible explanation is that when the 5 mm Hamou II was used, the traditional approach was performed, and the use of the speculum during this procedure might be the reason of the different VAS we obtained. Indeed, it has been demonstrated in the literature that hysteroscopy procedure performed using the traditional technique is often painful and requires some form of

anesthesia [4, 7, 19]. Cooper et al. [4] in a review of 2010 suggest that the vaginoscopic approach—the “no touch” technique—significantly reduces the pain experienced by the patients during the procedure, while the number of successfully completed hysteroscopies is similar to the one performed using the traditional technique.

In our opinion it is important to specify that, even if the data of the present study show no relevant differences between the 5 mm Bettocchi and the 5 mm Hamou II, as far as the reliability and the satisfaction of the operator during the procedure are concerned, it must not be forgotten that the use of the 5 mm Bettocchi enables many surgical procedures. Indeed, whereas the 5 mm Hamou II have only a diagnostic purpose, the 5 mm Bettocchi is equipped with an operative canal through which many ancillary instruments might be used to treat many intra-uterine diseases immediately after diagnosis, thus performing the “see and treat” approach proposed by Bettocchi et al. [20, 21]. Moreover, the use of ancillary instruments, like endoscopic forceps, through the operative canal is helpful to achieve the uterine cavity when a partial external/internal cervical ostium stenosis is present.

In conclusion, the data of the present study suggest that using the 4-mm hysteroscope enables a less painful procedure and have a higher successful rate with far less complications due to either external/internal cervical ostium stenosis or unbearable pain. Thanks to the recent technical and instrumental improvements, a growing number of women can successfully undergo hysteroscopy in an office setting without any kind of anesthesia [5, 22]. Moreover, several of these exams might end in a treatment performing the “see and treat” procedure thanks to the use of the hysteroscope equipped with an operative canal and the use of saline solution: the overall result of this approach providing both a reduction of the sanitary costs and a better and faster solving of patients’ needs.

Based on our results and on previously reported data, the use of a hysteroscope with the smallest possible caliber as well as the use of saline solution is recommendable.

Conflict of interest None.

References

1. Pluchino N, Ninni F, Angioni S, Artini P, Araujo VG, Massimetti G, Genazzani AR, Cela V (2010) Office vaginoscopic hysteroscopy in infertile women: effects of gynecologist experience, instrument size, and distension medium on patient discomfort. *J Minim Invasive Gynecol* 17:344–350
2. Campo R, Van BY, Rombauts L, Brosens I, Gordts S (1999) Office mini-hysteroscopy. *Hum Reprod Update* 5:73–81
3. Cicinelli E, Parisi C, Galantino P, Pinto V, Barba B, Schonauer S (2003) Reliability, feasibility, and safety of minihysteroscopy with a vaginoscopic approach: experience with 6,000 cases. *Fertil Steril* 80:199–202
4. Cooper NA, Smith P, Khan KS, Clark TJ (2010) Vaginoscopic approach to outpatient hysteroscopy: a systematic review of the effect on pain. *BJOG* 117:532–539
5. Bettocchi S, Nappi L, Ceci O, Selvaggi L (2004) Office hysteroscopy. *Obstet Gynecol Clin North Am* 31:641–654 (xi)
6. Valle RF (1999) Office hysteroscopy. *Clin Obstet Gynecol* 42:276–289
7. Pellicano M, Guida M, Zullo F, Lavitola G, Cirillo D, Nappi C (2003) Carbon dioxide versus normal saline as a uterine distension medium for diagnostic vaginoscopic hysteroscopy in infertile patients: a prospective, randomized, multicenter study. *Fertil Steril* 79:418–421
8. Shankar M, Davidson A, Taub N, Habiba M (2004) Randomised comparison of distension media for outpatient hysteroscopy. *BJOG* 111:57–62
9. Bettocchi S, Selvaggi L (1997) A vaginoscopic approach to reduce the pain of office hysteroscopy. *J Am Assoc Gynecol Laparosc* 4:255–258
10. Unfried G, Wieser F, Albrecht A, Kaider A, Nagele F (2001) Flexible versus rigid endoscopes for outpatient hysteroscopy: a prospective randomized clinical trial. *Hum Reprod* 16:168–171
11. Finikiotis G (1993) Side-effects and complications of outpatient hysteroscopy. *Aust N Z J Obstet Gynaecol* 33:61–62
12. Tangsirawatthana T, Sangkomkamhang US, Lumbiganon P, Loapaiboon M (2009) Paracervical local anaesthesia for cervical dilation and uterine intervention. *Cochrane Database Syst Rev* (1). doi:10.1002/14651858.CD005056.pub2
13. Bracco PL, Vassallo AM, Armentano G (1996) Infectious complications of diagnostic hysteroscopy. *Minerva Ginecol* 48:293–298
14. Kasius JC, Broekmans FJ, Fauser BC, Devroey P, Fatemi HM (2011) Antibiotic prophylaxis for hysteroscopy evaluation of the uterine cavity. *Fertil Steril* 95:792–794
15. de Carvalho Schettini JA, Ramos de Amorim MM, Ribeiro Costa AA, Albuquerque Neto LC (2007) Pain evaluation in outpatients undergoing diagnostic anesthesia-free hysteroscopy in a teaching hospital: a cohort study. *J Minim Invasive Gynecol* 14:729–735
16. Perez-Medina T, Bajo JM, Martinez-Cortes L, Castellanos P, Perez de Avila I (2000) Six thousand office diagnostic-operative hysteroscopies. *Int J Gynaecol Obstet* 71:33–38
17. Cicinelli E (2010) Hysteroscopy without anesthesia: review of recent literature. *J Minim Invasive Gynecol* 17:703–708
18. Nagele F, O’Connor H, Davies A, Badawy A, Mohamed H, Magos A (1996) 2500 outpatient diagnostic hysteroscopies. *Obstet Gynecol* 88:87–92
19. Brusco GF, Arena S, Angelini A (2003) Use of carbon dioxide versus normal saline for diagnostic hysteroscopy. *Fertil Steril* 79:993–997
20. Bettocchi S, Ceci O, Di VR, Pansini MV, Pellegrino A, Marelllo F, Nappi L (2002) Advanced operative office hysteroscopy without anaesthesia: analysis of 501 cases treated with a 5 Fr. bipolar electrode. *Hum Reprod* 17:2435–2438
21. Porreca MR, Pansini N, Bettocchi S, Loverro G, Selvaggi L (1996) Hysteroscopic polypectomy in the office without anesthesia. *J Am Assoc Gynecol Laparosc* 3:S40
22. Bettocchi S, Ceci O, Nappi L, Di VR, Masciopinto V, Pansini V, Pinto L, Santoro A, Cormio G (2004) Operative office hysteroscopy without anesthesia: analysis of 4863 cases performed with mechanical instruments. *J Am Assoc Gynecol Laparosc* 11:59–61