



Ambulatory Hysteroscopy: Evaluating Pain and Determining Factors

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Abstract

Study objective To measure pain using a visual analogue scale (VAS) and analyse its relationships with variables such as menopausal status, parity, uterine and cervical pathology, procedure length, and anxiety in patients undergoing ambulatory hysteroscopy (AH).

Design Prospective observational study.

Setting Dr DY Patil Medical Hospital and Research Centre, Dr.D.Y. Patil Vidyapeeth, Pimpri, Pune.

Patients Seventy-five women.

Intervention Ambulatory hysteroscopy(AH).

Methodology AH was performed in seventy-five patients using vaginoscopic approach. At the end of the procedure, the intensity of pain was assessed using the visual analogue scale (VAS), from the score of 0 (no pain) to 10 (intolerable pain). The factors determining pain were assessed.

Results Patients who underwent AH reported mild pain in 66% of cases, moderate pain in 22%, and severe pain in 12% of cases. The most frequent reason for referral was abnormal uterine bleeding (AUB).

In the moderate pain group, the bivariate analysis was statistically significant for menopausal status (P values < 0.001), cervical pathology (< 0.001), and duration of procedure (0.001) and in multivariate analysis nulliparity (0.001) and menopausal status (0.001) were the significant determining factors.

In severe pain group, the bivariate analysis was statistically significant for cervical pathology (P value = 0.001) and in multivariate analysis cervical pathology (0.003) and uterine pathology (0.002) were the significant determining factors.

Conclusion Hysteroscopy is a safe, painless and a gold standard procedure. Pain experienced during AH was significantly influenced by cervical pathology. Gynaecologists in practise should receive training and start using AH to assess the endometrial cavity.

Keywords Ambulatory hysteroscopy · Factors · Pain

Introduction

In hysteroscopy, a rigid or flexible endoscope is inserted through the os of the cervix to view within the uterus, and distending media are then used to enable comprehensive visualisation of the endometrial cavity [1].

Current best practice and gold standard for assessing the endometrial cavity is AH [2]. Traditional hysteroscopy had several difficulties, including the use of larger diameter instruments and the need for anaesthesia and admission. To decrease this, “see and treat” method was developed in the late twentieth century. Also known as office operative

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hysteroscopy where the concept of a single procedure with the operative component integrated into the diagnostic workup is done [3].

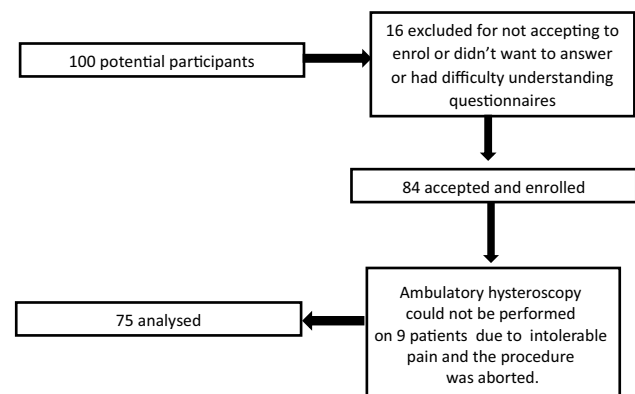
The emergence of AH and advancements made by pioneers like Betocchi et al. who transformed contemporary hysteroscopy [4], by incorporating the vaginoscopic technique, use of small instruments and the Betocchi sheath [3] have all contributed to the procedure's acceptance on a global scale.

Despite claims that AH is painless, multiple studies have shown that this is not the case. A large series conducted by Cicinelli et al. inferred that 10% of the 8000 cases experienced mild pain and 0.5% severe pain [5]. Another study conducted by S. Bettocchi of 4863 cases reported that 71.9–93.5% of women experienced low to moderate pain except, where the endometrial polyp was larger than the diameter of the internal os [6].

De Angelis stressed in 2003 the significance of reducing the patient's pain or discomfort during hysteroscopy to make the treatment generally accepted and widely tolerated [7]. Hysteroscopy has been extremely successful; however, the technique is still not painless. The factors influencing pain during hysteroscopy have been investigated with varying degrees of success. Our study is an effort to comprehend the relationship between many variables and the degree of pain felt during hysteroscopy. Our study evaluates the relationship of the pain intensity with factors like patient's parity, menopausal status, anxiety, cervical and uterine pathology and duration of procedure. The visual analogue scale (VAS) was used to measure the degree of pain [8].

Methods

A prospective observational study was carried out at Dr. D. Y. Patil Medical College Hospital & Research Centre, Dr.D.Y. Patil Vidyapeeth Pimpri, Pune from August 2020 to July 2022. A total of 100 patients were referred to the OPD. Amongst these, 16 patients refused to undergo the procedure. The remaining 84 patients consented for AH. Failure of procedure was noted in 9 patients due to intolerable pain, and the procedure was aborted. Hence, 75 patients in total were examined and assessed.



An ambulatory hysteroscopy employing the vaginoscopic technique, as described by Betocchi and Selvaggi in 1997 [3], was carried out. A rigid 2.9 mm hysteroscope made by Karl Storz in Tuttlingen, Germany, with a 30° forward oblique Hopkins type II lens and a 4.3 mm outer sheath diameter was used. Normal saline was used as the distension medium, and a pressure range of 60–100 mmHg was maintained. No cervical cleaning or premedication was administered.

Patients who were referred to the OPD with complaints of abnormal uterine bleeding (AUB), abnormal findings on hysterosalpingography or ultrasonography, recurrent abortions, infertility, missed intrauterine device, or women needing targeted endometrial biopsies were included in the study.

Suspicion of pregnancy, active vaginal bleeding, a history of cardiovascular disease, a recent uterine perforation, acute pelvic inflammatory disease were the exclusion criteria.

Parity, mode of delivery (prior LSCS and vaginal delivery), menopausal status, uterine pathology, cervical pathology, duration of procedure, and anxiety score were the factors which were assessed for correlation with degree of pain during AH.

The patient was informed about the procedure, its process, indication, complications, and prognosis before giving her informed consent. She received instruction on the two subscales that make up the Spielberger State-Trait Anxiety Inventory (STAI), State Anxiety (STAI-S) and Trait Anxiety (STAI-T) [9]. The visual analogue scale and its scoring methodology were also explained.

It was ensured that there would be little waiting prior to the procedure. Using a vaginoscopic approach, hysteroscopy was performed without the aid of anaesthesia and analgesia. A rigid 2.9 mm hysteroscope made by Karl Storz in Tuttlingen, Germany, with a 30° forward oblique Hopkins type II lens and a 4.3 mm outer sheath diameter was used. Normal

saline was used as the distension medium, and a pressure range of 60–100 mmHg was maintained.

A sequential evaluation of the vagina, external os, cervical canal, internal os, uterine cavity, endometrium and each tubal ostium was done.

A nurse supported the patient during the process (“vocal local”), which helped to alleviate anxiety. In order to further involve the patient in the process, the surgeon allowed her to view the monitor while outlining any potential irregularities.

Any pathology found was evaluated, and procedural duration was recorded. A standardised hysteroscopy report was generated. The participant was monitored for any discomfort, pain, or complications and was shown the visual analogue scale (VAS) by the nurse after 10 min of the completion of procedure, and they evaluated it based on the level of pain felt during AH. Pain intensity was recorded as no pain = 0, mild pain = 1–3, moderate pain = 4–7 cm, severe or intolerable pain = 8–10 cm [8].

Patients were segregated into three groups as per pain intensity: Mild, moderate and severe pain groups. Those who experienced moderate to severe pain were evaluated for determining factors including parity, previous LSCS, menopausal status, uterine pathology, cervical pathology, anxiety score and duration of procedure. The data were analysed using the SPSS (statistical program for social sciences) Software version 20/Epi info/Primer/Win-pepi.

Procedure failure was defined as either the inability to achieve scope insertion or being unable to complete the procedure due to excruciating discomfort [10].

Results

A prospective observational study was conducted at Dr. D Y Patil Medical College Hospital & Research Centre, Dr.D.Y. Patil Vidyapeeth Pimpri, Pune from August 2020 to July 2022. A total of 75 cases were examined and assessed. The average BMI was 29.4 kg/m², and the average age was 32.5 years.

During AH, 66% of patients reported mild pain and accounted for majority of cases. Moderate pain and severe pain were reported in 22% & 12% of case, respectively. 28% of women were nulligravida, whereas 72% were parous. 20% of patients were menopausal, and 34% had previously undergone a lower segment caesarean section. The most frequent reasons for treatment were; abnormal uterine bleeding, infertility, post-menopausal bleeding, recurrent pregnancy loss, and misplaced IUCD (intra uterine contraceptive device). (38%, 25%, 18%, 9% and 8%, respectively.)

In the moderate pain group, the bivariate analysis was statistically significant for menopausal status (P values < 0.001), cervical pathology (< 0.001), and duration of procedure (0.001) and in multivariate analysis nulliparity

Table 1 Characteristics of the patient

	No. of cases ($n=75$)	Percentage (%)
Parity		
Parous	54	72
Nulligravida	21	28
Previous LSCS	26	34
Menopausal	15	20

Table 2 Pain score by VAS

Pain score	No. of cases ($n=75$)	Percentage
Mild	49	66
Moderate	17	22
Severe	09	12
Total	75	100

(0.001) and menopausal status (0.001) were the significant determining factors.

In the severe pain group, the bivariate analysis was statistically significant for cervical pathology (P value = 0.001) and in multivariate analysis cervical pathology (0.003) and uterine pathology (0.002) were the significant determining factors.

Cervical pathology was present in 7 patients (35%) reporting severe pain. Three had cervical stenosis (15%), 2 patients had cervical polyp (10%), 1 had adhesions (5%) and one patient had cervical septum (5%).

No procedural complications were noted (Tables 1, 2, 3, 4, 5 and 6).

Discussion

The findings of this study’s demonstrated that ambulatory hysteroscopy is a painless, safe treatment that may be performed with good tolerability without the use of anaesthesia or analgesics. During ambulatory hysteroscopy, 66% of patients reported mild pain, 22% reported moderate pain, and 12% reported severe pain.

In the moderate pain group, the bivariate analysis was statistically significant for menopausal status (P values < 0.001), cervical pathology (< 0.001), and duration of procedure (0.001) and in multivariate analysis nulliparity (0.001) and menopausal status (0.001) were the significant determining factors. In the severe pain group, the bivariate analysis was statistically significant for cervical pathology (P value = 0.001) and in multivariate analysis cervical

Table 3 Factors affecting moderate pain score—Bivariate Analysis

Factors	Moderate pain (4–7 cm) (n = 17)	Percentage %	RR (95% CI)	P value
Total cases = 75				
Parity				
Nulliparous	9/21	42	2.6 (1.3–5.0)	0.02
Non- nulliparous	8/54	14.8	1	
Menopausal status				
Menopausal	10/15	66	5.7 (2.6–12.5)	<0.001
Non-Menopausal	7/60	11	1	
Previous LSCS				
One or more previous LSCS	6/26	23	1.08 (0.43–2.46)	0.94
One or more previous vaginal delivery and nulliparous	11/49	22	1	
Cervical pathology				
Present	11/20	55	5.0 (2.1–67.4)	<0.001
Absent	6/55	10	1	
Uterine pathology				
Present	9/23	39	2.5 (1.1–5.8)	0.03
Absent	8/52	36	1	
Duration of procedure				
> 3 min	12/27	44	4.3 (1.7–10.8)	0.001
< 3 min	5/48	10	1	
Anxiety				
> 40 score	11/30	36	2.8 (1.1–6.6)	0.02
< 40 score	6/45	13	1	

Table 4 Factors affecting moderate pain score—Multivariate Analysis

Moderate pain	Adjusted RR (95% CI)	P value
Nulliparity	5.1 (2.0–13.4)	0.001
Menopausal status	9.8 (4.1–23.2)	<0.001
Cervical pathology	1.1 (0.37–3.41)	0.85
Uterine pathology	1.7 (0.5–5.5)	0.41
Duration of the procedure	1.8 (0.44–7.7)	0.41
Anxiety	2.6 (0.91–7.26)	0.07

pathology (0.003) and uterine pathology (0.002) were the significant determining factors.

De Iaco et al. [11] in his study reported severe pain in 38% women who underwent diagnostic hysteroscopy, Freitas Fonseca et al. [12] reported severe pain, VAS > 7 in 32% immediately after the procedure, and a similar study by Shereef M et al. [10] reported that 46% of patients had moderate pain and 17% had severe pain.

A large series conducted by Cicinelli et al. inferred that 10% of the 8000 cases experienced mild pain and 0.5% experienced severe pain [5]. Peter Torok et al. [13] included 70 cases for the examination of pain score and 100% of the patients were rated as having mild discomfort.

The variable that has been common to pain amongst moderate and severe pain groups is the presence of cervical pathology. The navigation of the hysteroscope through the cervical canal and the internal os is the place of maximum discomfort. This can be explained by the presence of the hypogastric plexus which provides strong innervation to the fibromuscular cervix. Factors like nulliparity, menopausal status, cervical pathologies, lesions, polyps, adhesions, stenosis of internal or external os limit the cervical canal making it more difficult for the hysteroscope to pass through and can increase the pain perception.

Our study is supported by studies of De Iaco et al. [11], and Raimondo et al. [14] who revealed a direct correlation between cervical pathology and pain intensity and Ivan Mazzon's study [15] according to which a VAS > 3, and the occurrence of synechiae is correlated. Menopause and nulliparity were found to be factors in a study by De Carvalho Schettini et al. [16] accounting for pain during hysteroscopy. According to a study by Ivan Mazzon et al. [15], the number of vaginal deliveries is inversely proportional to pain intensity. Shereff [10] found that nulliparity, procedure lasting longer than 2 min and the presence of cervical pathology are all related with excruciating discomfort. In patients who had considerable pain, the length of the hysteroscopy was

Table 5 Factors affecting severe pain score—Bivariate Analysis

Factors Total cases = 75	Severe pain (7–10 cm) (n = 09)	Percentage %	RR (95% CI)	P value
Parity				
Nulliparous	4/21	19	2.1 (0.6–6.9)	0.28
Non- nulliparous	5/54	9	1	
Menopausal status				
Menopausal	4/15	26	3.2 (1.0–10.5)	0.08
Non-menopausal	5/60	8	1	
Previous LSCS				
One or more previous LSCS	4/26	15	1.5 (0.4–5.1)	0.53
One or more previous vaginal delivery and nulliparous	5/49	10	1	
Cervical pathology				
Present	7/20	35	9.6 (2.2–42.5)	0.001
Absent	2/55	3.6	1	
Uterine pathology				
Present	5/23	21	2.8 (0.8–9.6)	0.11
Absent	4/52	7.6	1	
Duration of procedure				
> 3 min	6/27	22	3.6 (0.96–13.1)	0.06
< 3 min	3/48	6.2	1	
Anxiety				
> 40 score	7/30	23	5.3 (1.2–23.8)	0.02
< 40 score	2/45	4.4	1	

Table 6 Factors affecting severe pain score—Multivariate Analysis

Severe pain	Adjusted RR (95% CI)	P value
Menopausal status	0.55 (0.22–1.4)	0.21
Cervical pathology	16.5 (2.66–102.6)	0.003
Uterine pathology	5.2 (1.8–15.0)	0.002
Duration of the procedure	0.34 (0.09–1.32)	0.12
Anxiety	3.9 (1.1–14.0)	0.04

much longer, according to prospective research by Fonseca et al. [12]

Contrarily, a study by Peter Torok [13] found no connection between the presence of discomfort and variables including menopausal state and parity. In a study of 8000 cases, Cicinelli et al. [5] found no connection between nulliparity and pain during hysteroscopy. No correlation was found between pain reporting with, a woman's parity, menopause, dysmenorrhea, a history of menorrhagia, a prior cervical surgery, or age, according to Antonio A. Paulo et al. [17] The postmenopausal status was an insignificant factor in study, and studies conducted by Ivan Mazzon's [15], van Dongen et al. [18] and De Iaco et al. [11] revealed no association with pain in diagnostic hysteroscopy and menopause. De Carvalho Schettini [16] and Ivan Mazzon [15] reported

no direct relation of the duration of procedure and severity of pain.

Our study demonstrated a correlation of moderate pain with cervical pathology, nulliparity, menopausal status, and duration of the procedure. Correlation of severe pain with the presence of cervical and uterine pathology was done.

Performing AH without analgesia and anaesthesia is a skill. Factors, such as cervical pathology, parity, menopausal status, and the duration of procedure, all affect the degree of pain during AH. However, mastering the technique, incorporation of the vaginoscopic approach, gentle movements while manoeuvring the scope and patient selection play a crucial role in reduction in pain perception.

Conclusion

AH should be the primary tool for evaluation of the uterine cavity. The key to successful AH is when the patient experiences no or mild pain. This has been achieved by incorporation of instruments of minimal diameters, vaginoscopic technique and low uterine distension pressure. Correlation between incidence of moderate pain amongst nulliparous women, menopausal women, those with cervical pathology, and those undergoing the procedure for more duration and incidence of severe pain amongst women with cervical and

uterine pathology has been found in this study. To reduce the perception of pain counselling, selection of patients and determining appropriate analgesia and anaesthesia based on patients characteristics and difficulty of procedure [19] can be considered. The current situation demands for an end to the blind procedures for uterine evaluation, and thus, the gynaecologists should adopt AH, its technique, have full knowledge of the procedure and must take accredited training in the art of AH.

Declarations

Conflict of interest There are no conflict of interest.

Ethical standard statement The institutional ethical committee approval by Helenskis declaration.

Consent statement Counselling was provided to all patients, and their informed consent was obtained.

References

- Carugno J, Grimbizis G, Franchini M, Alonso L, Bradley L, Campo R, Catena U, de Angelis C, Di Spiezio Sardo A, Farrugia M, Haimovich S, Isaacson K, Moawad N, Saridogan E, Clark TJ. An international working group of the American association of gynecologic laparoscopists (AAGL), the European Society for gynaecological endoscopy (ESGE) and the global community of hysteroscopy (GCH). *Hysterosc News* 2022.
- Rudic-Biljic-Erksi I, Vasiljevic M, Rakic S, Mihajlovic S, Dzatic-Smiljovic O, Billjic-Erski A. Hysteroscopy-History and development. *Serbian Arch* 2018;1–2.
- Bettocchi S, Selvaggi L. A vaginoscopic approach to reduce the pain of office hysteroscopy. *The Journal of the Am Assoc Gynecol Laparosc.* 1997;4(2):255–8. [https://doi.org/10.1016/S1074-3804\(97\)80019-9](https://doi.org/10.1016/S1074-3804(97)80019-9).
- Manchanda R, Sharma. Modern hysteroscopy and hysteroscopic surgery, 2019;5:93–102.
- Cicinelli E, Schonauer LM, Barba B, Tartagni M, Luisi D, Di Naro E. Tolerability and cardiovascular complications of outpatient diagnostic mini hysteroscopy compared with conventional hysteroscopy. *J Am Assoc Gynecol Laparosc.* 2003;10:399–402.
- Bettocchi S, Ceci O, Nappi L, Di Venere R, Masciopinto V, Pansini V, Pinto L, Santoro A, Cormio G. Operative office hysteroscopy without anesthesia: analysis of 4863 cases performed with mechanical instruments. *J Am Assoc Gynecol Laparosc.* Received 23 Jan 2003, Accepted 11 Jul 2003, Available online 15 July 2005.
- Angelis DC, Santoro G, Re ME, Nofroni I. Office hysteroscopy and compliance: mini-hysteroscopy versus traditional hysteroscopy in a randomized trial. *Hum Reprod.* 2003;18(11):2441–5.
- Hawker GA, Mian S, Kendzerska T, French M. Measures of adult pain: visual analog scale for pain (VAS Pain), numeric rating scale for pain (NRS Pain), McGill pain questionnaire (MPQ), short-form McGill Pain questionnaire (SF-MPQ), chronic pain grade scale (CPGS), short form-36 bodily pain scale (SF-36 BPS), and measure of intermittent and constant osteoarthritis pain (ICOAP). *Arthritis Care Res.* 2011;63:S240–52.
- Spielberger CD. Manual for the state-trait anxiety inventory. Consulting Psychologists Press Inc; 1983.
- Zayed SM, Elsetohy KA, Zayed M, Fouda UM. Factors affecting pain experienced during office hysteroscopy. *Middle East Fert Soc Journal.* 2014;20:154–8.
- De Iaco P, Marabini A, Stefanetti M, Del Vecchio C, Bovicelli L. Acceptability and pain of outpatients hysteroscopy. *J Am Assoc Gynecol Laparosc.* 2000;7:71–5.
- Fonseca MD, Sessa FV, Resende JA, Guerra CG, Andrade CM, Crispi CP. Identifying predictors of unacceptable pain at office hysteroscopy. *J Minim Invas Gynecol.* 2014;21(4):586–91.
- Török P, Major T. Evaluating the level of pain during office hysteroscopy according to menopausal status, parity and size of instrument. *Arch Gynaecol Obstetr.* 2013;287:985–8.
- Raymundo TS, Fonseca MF, Santos LC, Crispi CP, Andrade CM, Lamblet MF. Predictors of pain during and after office hysteroscopy. *J Minim Invas Gynecol.* 2008;15(6):81S–S82.
- Mazzoni I, Favilli A. Pain during diagnostic hysteroscopy: What is the role of the cervical canal? A pilot study. *Eur J Obstetr Gynecol Reproduct Biol.* 2014;183:169–73.
- de Carvalho Schettini JA, Ramos de Amorim MM, Ribeiro Costa AA, Albuquerque Neto LC. Pain evaluation in outpatients undergoing diagnostic anesthesia-free hysteroscopy in a teaching hospital: a cohort study. *J Minim Invas Gynecol.* 2007;14:729–35.
- Paulo AA, Damasceno-Costa J, Pipa A, Afreixo VM. Hysteroscopy and pain: What risk factors should we consider in office hysteroscopy? Are there really any? *Int J Reprod Contracept Obstet Gynecol.* 2016;5(1):74–9.
- Baramki TA. Hysterosalpingography. *Fertil Steril.* 2005;83:1595–606.
- Buzzaccarini G, Pacheco LA, Vitagliano A, Haimovich S, Chiantera V, Török P, Vitale SG, Laganà AS, Carugno J. Pain management during office hysteroscopy: an evidence-based approach. *Medicina.* 2022;58(8):1132.

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