Lidocaine Spray and Outpatient Hysteroscopy: Randomized Placebo-Controlled Trial

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Objective: **To assess the efficacy of lidocaine spray during outpatient hysteroscopy for reducing procedure-related pain and to identify risk factors for discomfort.**

Methods: **One hundred twenty-one women were assigned randomly to have application of lidocaine spray or placebo to the uterine cervix during outpatient hysteroscopy. The main outcome measure was pain during hysteroscopy, assessed on a visual analog scale.**

Results: **There was no statistically significant difference between study and control groups in mean age, rate of nulliparity, postmenopausal state, need for cervical dilation, or percentage of women who used hormone replacement therapy. Indications for diagnostic hysteroscopy were similar between groups. Women in the lidocaine group had statistically significantly less pain during the procedure than women in the placebo group (2.2 ± 1.9 and 3.7 ± 2.5, respectively; $P < .001$). Women with abnormal uterine findings (submucous myoma, endometrial polyps, or intrauterine adhesions) had significantly higher pain scores than women with normal cavities (2.2 ± 1.9 and 3.2 ± 2.4, respectively; $P < .002$). Aerosol anesthesia and normal uterine findings were independently associated with less pain. No procedure had to be abandoned because of excessive pain or complications, and no women required hospitalization.**

Conclusion: **Women treated with lidocaine spray had significantly less pain. Uterine cavity abnormality might be associated with a higher degree of pain during hysteroscopy. (Obstet Gynecol 2000;96:661–4. © 2000 by The American College of Obstetricians and Gynecologists.)**

Outpatient hysteroscopy, the investigation of choice for uterine cavity abnormalities,[1,2] allows direct inspection and directed biopsy and can be done without general anesthesia to reduce cost and time. Its main advantage over the relatively blind procedure of dilation and curettage is that it is more effective for identifying intrauterine abnormalities.[3,4]

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One limitation of widespread use of outpatient hysteroscopy is pain and discomfort in some women. More than 30% of women who have outpatient hysteroscopies without local anesthesia have severe pain.[5] In a study that used flexible hysteroscopes without local anesthesia, more than 15% of women had severe pain.[6] Some authors reported that local anesthesia was not necessary in most women.[4,7] Others suggested administration of intracervical or paracervical nerve block,[7–9] or topical anesthesia[10,11] but did not establish the efficacy of those anesthetics. Local anesthesia applied with a spray mechanism rather than intracervical or paracervical injection has advantages.[12] It is painless, there is no danger of bleeding, and there is potentially less risk of infection and intravasation.[7–9] The need, efficacy, and method of application of local anesthesia are still controversial. We did a randomized, placebo-controlled study to assess the efficacy of lidocaine spray during outpatient hysteroscopy for reducing pain and to identify factors related to discomfort.

Materials and Methods

One hundred twenty-one consecutive women who had diagnostic hysteroscopy for abnormal uterine bleeding or infertility at the Service de Gynécologie, Hôpital Hôtel-Dieu de Paris entered the study after giving informed consent. Inclusion criteria were diagnostic hysteroscopy and subject approval after a detailed explanation. Exclusion criteria were menorrhagia at the time of the procedure, known sensitivity to lidocaine, epilepsy, significantly impaired respiratory or cardiac conduction functions, and active liver disease.

Women were randomly assigned to receive lidocaine aerosol spray (Xylocaine 5%, Astra France Production, Monts, France) or placebo on the cervix and cervical canal according to a computer-generated randomization code revealed only at the end of the study. Lidocaine and placebo were packaged in identical bottles

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Table 1. Characteristics of Study Subjects

Characteristic	Anesthesia (n = 62)	Placebo (n = 56)	P
Age (y)	49.6 ± 12.5	49.4 ± 10.1	NS
Nulliparas (%)	47.1	52.9	NS
Postmenopausal (%)	41.9	45.5	NS
Need for cervical dilation and tenaculum use (%)	11.3	19.6	NS
Operator (%)			
1	66.1	67.7	
2	33.9	29.3	NS
Use of HRT (%)	32.3	25.0	NS

NS = not significant; HRT = hormone replacing therapy.

and could not be differentiated. This assured double masking.

Subjects reported on a form their greatest pain during the procedure and immediately after it before endometrial sampling. An independent nurse instructed subjects how to score their pain before the procedure, and scores were masked from the operator. The form contained a visual analog scale for women to report their responses (from no pain to excruciating pain). On the other side of the scale, masked from the subject, there was a 10-cm numeric scale seen only by the nurse.

The spray worked with a pump mechanism, and delivery was through a thin plastic nozzle that could be threaded through the cervical canal. During the study period (December 1998 to September 1999), lidocaine or placebo was sprayed onto the surface of the cervix and the cervical canal through 360°. Three metered doses were given, equivalent to a total dose of 30 mg of base lidocaine. The tenaculum was used only in cases in which cervical dilation was needed.

Hysteroscopy was done 5 minutes after application of lidocaine or placebo, using a standard 2.7-mm flexible hysteroscope (Olympus Optical Co, GmbH, Hamburg, Germany). The uterine cavity was distended with normal saline. Illumination was by high-intensity cold-light source (250 W) through a fiber-optic lead. Images were viewed on a high-resolution color monitor, facing the operator and the patient, using a chip camera.

The power calculation used to estimate study size assumed that the mean ± standard deviation (SD) pain score of women without local anesthesia was 4.5 ± 2.0[13] and that would be reduced to 3.0 (33%) after lidocaine spray, with α (type I error) of 0.005 and β (type II error) of 0.2. Therefore, we planned to recruit 60 women to each group. Statistical analysis was done with Student t test and χ^2 test. $P < .05$ was considered statistically significant. Analysis of variance was used to detect two-way interaction effects (effect modifiers).

Table 2. Indications for Outpatient Hysteroscopies

Indication	Anesthesia (n = 62)	Placebo (n = 56)	P
Infertility	4.8	5.4	NS
Menometrorrhagia	38.7	30.4	NS
Postmenopausal bleeding	29.0	30.4	NS
Pretamoxifen treatment	1.6	7.1	NS
Postoperative hysteroscopy	16.1	14.3	NS
Ultrasonographic findings	9.7	12.5	NS

NS = not significant.
Data are given as percentages.

Results

One hundred twenty-one women were enrolled. In the placebo group, two women did not fill out questionnaires properly and were excluded. In one case in the anesthetic group, the diagnostic hysteroscopy was not done because of cervical stenosis. Thus, the study included 118 women (62 in the anesthetic group and 56 in the placebo group). Subject characteristics are given in Table 1. The mean ± SD ages of women in the study and the control groups were 49.6 ± 12.5 and 49.4 ± 10.1 years, respectively. There was no statistically significant difference between the study and the control groups in rate of nulliparity, postmenopausal state, need for cervical dilation, and tenaculum use, or the percentage of women taking hormone replacement therapy (HRT) (Table 1). There was no difference in indications for diagnostic hysteroscopies between groups (Table 2).

Women in the anesthetic group had statistically significantly less pain during the procedure than women in the placebo group (2.2 ± 1.9 and 3.7 ± 2.5, respectively; $P < .001$). Women with abnormal uterine findings (endometrial cancer, submucous myoma, endometrial polyps, or intrauterine adhesions [Table 3]) and normal endometriums had pain scores of 2.2 ± 1.9 and 3.2 ± 2.4, respectively ($P < .002$). Analysis of variance on those two factors detected no interaction between the lidocaine group and abnormal uterine findings. When we adjusted for those factors, the relationship

Table 3. Results of Hysteroscopies

Finding during hysteroscopy	Anesthesia (n = 62)	Placebo (n = 56)	P
Submucous myoma	17	13	NS
Endometrial polyps	17	14	NS
Intrauterine adhesions	4	0	NS
Endometrial hypertrophy	4	3	NS
Endometrial cancer	1	0	NS
Adenomyosis	4	4	NS
Other	4	3	NS
Normal	11 (17.7%)	19 (33.9%)	.05

NS = not significant.

between lidocaine spray and pain scores did not change. Women who had cervical dilation and those who did not had pain scores of 4.1 ± 2.5 and 2.7 ± 2.3, respectively ($P = .02$).

No procedure was abandoned because of excessive pain or other complications. One woman in the placebo group had a severe vagal response. No women required additional analgesia or hospitalization. All women left our outpatient clinic within 1 hour of the end of the procedure.

Discussion

Our study showed that aerosol spray lidocaine on the cervix reduced pain and discomfort after diagnostic hysteroscopy. Previous reports on diagnostic hysteroscopy with intracervical,[7] paracervical,[8,13] or topical uterine anesthesia[10,11,14] nerve blocks did not provide adequate evidence that local anesthesia was efficacious for reducing pain. Few randomized controlled trials were done to evaluate efficacy of local anesthesia. Broadbent et al[7] found no advantage in using intracervical lidocaine nerve block for outpatient hysteroscopy. Johanson et al[8] reported that paracervical lidocaine had no significant effect on reducing pain during laser ablation of the cervical transformation zone. A study on paracervical nerve block[9] in outpatient diagnostic hysteroscopy confirmed that hysteroscopy is reliable for assessing intrauterine disease and is acceptable by most women, but it had no randomization or control groups. In a randomized controlled trial on paracervical anesthesia, Vercellini et al[13] did not find any decrease in pain during hysteroscopy and endometrial biopsy. Topical anesthesia was reported to decrease pain during outpatient hysteroscopy[10,11] but not significantly.

There are advantages to local anesthetic spray over intracervical or paracervical injection. It is a painless application, and there is no danger of bleeding and potentially less risk of infection and intravasation.[7–9] Our findings are similar to these of Davis et al,[12] who reported that lidocaine spray had beneficial effects in reducing discomfort. However, in their study nearly 15% of the women in both groups required additional analgesia, and seven of 120 had to have procedures using general anesthesia. They concluded that the aerosol was associated with a placebo effect rather than a pharmacologic effect. Zullo et al[15] reported that prilocaine spray plus lidocaine cream was more effective than lidocaine spray for decreasing pain during placement of the tenaculum and for shoulder pain after the procedure. However, they used the tenaculum in every case and a rigid hysteroscope of 5 mm, and the uterine cavity was distended with carbon dioxide.

Compared with those reports, our study was a prospective placebo-controlled trial using a flexible hysteroscope with no tenaculum, but in which dilation of the cervix was needed. Therefore, women tolerated the procedure better because none needed additional analgesia and none had shoulder pain resulting from the use of normal saline. The interval between application of lidocaine and insertion of the hysteroscope should be more than 4 minutes.[16] In a previous report,[12] the interval was not specified, and in another report,[15] the anesthesia was applied immediately before the procedure and might have caused bias.

Our study sought to identify factors that contribute to pain and found correlation with uterine disease. That finding needs further investigation. It could be explained by the longer duration of the procedure and the use of more saline when the operator suspected abnormality, because those elements were not examined in our study. It could also be attributed to pathophysiology of uterine contractions, or perhaps that women with no uterine cavity abnormalities feel relief, especially when they can see the image on the screen, and they might report lower degrees of pain.

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