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Research Article

# The Effect of Intrauterine Lidocaine versus Warm Saline Distention Medium for Pain Control during Office Hysteroscope

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## Abstract

**Background:** Outpatient hysteroscopy is a diagnostic procedure. It is indicated mainly in evaluation of women with abnormal uterine bleeding. The uterine cavity is a potential space so we need to use a distension media to see it. Aim of the Work: to compare between intrauterine lidocaine, warm saline distension medium and room temperature saline distension medium as regard their effectiveness on decreasing pain during, at the end of the procedure and 15 minutes after the end of the procedure.
**Patients and Methods:** This longitudinal randomized controlled clinical study included 75 women who underwent diagnostic outpatient office hysteroscopy in early Cancer detection Endoscopy Gynecology Unit at Ain Shams Obstetrics and Gynecology hospital in the period between October 2021 and January 2022. We evaluated the patient satisfaction as the percentage of patients who could undergo the hysteroscopic examination again using the same method. We measured the time taken to complete the procedure starting from introduction of the hysteroscope into the vagina until removing it from the cervix. Parameters of pain assessment differed significantly between the three groups. Results: In this work, there was statistically highly significant decrease mean VAS scores over time in the lidocaine group (Group C) compared to the warm saline distention medium group (Group B) and control group (Group A) during and at 1, 20 min after the procedure p-value <0.001, <0.001 and <0.001) respectively.
**Conclusion:** Simple analysis of VAS scores revealed a statistically significantly lower VAS score during and at the end of the procedure in the lidocaine group compared to the warm and room-temperature distention medium groups. The same finding wa held constant also after 15 minutes from the end of the procedure.

**Key words:** intrauterine lidocaine, warm saline distention medium, pain control, office hysteroscope

## Introduction

In-office hysteroscopy is globally considered essential for diagnosing and treating widespread intrauterine pathologies. It remains the gold standard for the management of abnormal uterine bleeding and uterine neoplasms [1]. It is now possible to safely treat in an outpatient setting endometrial and cervical polyps, fibroids and uterine synechiae as well as septa and other organic pathologies [2].

Abnormal uterine bleeding (AUB), traditionally defined as uterine bleeding that is abnormal in volume, regularity, and/or timing is common and affects 14–25% of women of reproductive age [3].

Up to 80% of women of postmenopausal bleeding and endometrial thickness greater than 5 mm have endometrial pathology and most pathological lesions have a focal growth pattern. The incidence of organic pathology including malignancy in this age groups makes early diagnosis mandatory [4].

Several methods for the diagnosis of uterine abnormalities have been developed including hysteroscopy (HS), to be able to offer an equivalent, or higher, diagnostic accuracy compared with dilatation and curretage [5]..

Although outpatient hysteroscopy is well tolerated by the patient without the need for treatment in the majority of cases, pain and discomfort might occur on some occasions [6]. Most cases in which a higher level of discomfort could be experienced include nulliparity or postmenopausal status, cervical stenosis or tortuosity, manipulation of the cervix with a speculum or tenaculum, uterine hyper-distension or peritoneal spill of the distension medium, and prolonged stimulation of myometrial sensitive fibers while performing challenging myomectomies [7].

Moreover, a high preoperative anxiety level could negatively impact on the patient's pain perception and might lead to a more painful procedure. For this reason, the administration of intrauterine lidocaine and warm saline measures could be managed in selected cases in order to both relieve the

patient from pain and facilitate the operator in carrying out the hysteroscopic examination [7].

Intrauterine lidocaine administration for hysteroscopic pain management was found effective and safe, pain scores were even lower for both diagnostic and operative procedure [8].

Physiological preheated saline solution to distend the intrauterine cavity could be a valid option to reduce pain, avoiding stimulating uterine wall contractility [9].

## Aim of the work

The aim of the work is to evaluate the effect of Intrauterine lidocaine versus warm saline distention medium for pain control during office hysteroscope.

Patients and methods

This longitudinal randomized controlled clinical study was carried out on 75 women who underwent diagnostic outpatient office hysteroscopy in early Cancer detection Endoscopy Gynecology Unit at Ain Shams obstetrics and gynecology hospital in the period between October 2021 and January 2022.

### Research Methodology

After approval of the ethical committee, all participants in the study were given a written, informed consent, after explaining the details of the study to them.

Participants included in this study had the following criteria: Age ≥ 18 years old, indications of diagnostic hysteroscopy: Cases complaining of abnormal uterine bleeding and /or undergoing the procedure to assess the endocervical canal, uterine cavity, and tubal Ostia for infertility.

While patients with contra-indications of diagnostic hysteroscopy: unable to exclude pregnancy, acute pelvic infection, active genital herpes, confirmed cervical or endometrial cancer and profuse bleeding at the time of the procedure, any usage of analgesic agent on the day of the procedure. - Failure of entry of the cervical canal requiring cervical dilatation, any additional procedure during the procedure : polypectomy, biopsy and adhesiolysis and patient refusal to participate in the study were excluded from the study.

After fulfilling inclusion and exclusion criteria, patients were equally randomly divided into three groups: Group A: As a control group, this group included 25 women undergoing diagnostic outpatient office hysteroscopy using room-temperature normal saline distention medium. Group B: This group included 25 women undergoing diagnostic outpatient office hysteroscopy using warmed normal saline distention medium. Group C: This group included 25 women undergoing diagnostic outpatient office hysteroscopy proceeded by infusions of intrauterine lidocaine 2% and normal saline at room temperature.

## Study Procedure:

All patients were subjected to Complete history taking including: age, parity, cycle phase, whether the patient had previously undergone this examination, indication for the examination, previous surgery including cesarean delivery and curettage, previous cervical procedures such as cauterization, presence of dysmenorrhea, dyspareunia, or hypogastric pain independent of the menstrual period; use of hormone therapy; whether the patient already knew about the examination; whether the patient was calm or anxious; whether the patient had pain, bleeding, or other symptoms at the time of undergoing the examination; and any use of analgesic agents before the procedure that gathered and recorded in predefined data sheets. Anthropometric assessment: calculation of body mass index. Dry body weight (kg), height (meter) and the body mass index (BMI) was calculated as the dry body weight (kg) divided by the squared height (meter). Ultrasound done to exclude any cervical or pelvic pathology or pregnancy. Office hysteroscopy performed using a vaginoscopic technique by the same examiner (a senior gynecologist) in each group as follows: Rigid hysteroscope (continuous flow, 30 degree forward oblique view) assembled in a 4-mm diameter diagnostic sheath with an atraumatic tip (Karl Storz Endoscopy®, Tuttlingen, Germany) with a high intensity cold light source and fiberoptic cable used to illuminate the uterine cavity.

In group A, Room-temperature normal saline: Bottles of 500 mL normal saline solution (Otsuka Pharmaceutical Co. Ltd, Japan) stored at room temperature was used. Ambient temperature was kept by an air conditioning system at 28°C.

In group B, Warmed normal saline: Bottles of 500 mL normal saline solution (Otsuka Pharmaceutical Co. Ltd, Japan) was warmed in a thermostatically controlled incubator to a temperature of 37.5°C (National Institute for Health and Care Excellence, 2008).

In group C, exposure of the cervix achieved using a posterior vaginal retractor. A Wallace® embryo transfer catheter (Smiths Medical International Ltd, Hythe, Kent, UK) introduced through the cervix passing the internal os, intrauterine instillation of 5 mL lidocaine 2% diluted in 15 mL normal saline administered via the catheter. The procedure commenced 5 minutes after the flushing. The vaginoscopic approach employed, using neither vaginal speculum nor tenaculum.

The pressure kept at 200-300 mmHg using a pressure adjustable cuff system with the aim of maintaining the lowest pressure required to distend the uterine cavity. All Office Hysteroscopy procedures performed with a vaginoscopic approach without utilizing a speculum or applying traction to the cervix with a tenaculum [11].

Pain measured using a 10-cm visual analogue scale (VAS) graded from 0 to 10.

In this scale, patients were asked as follows: (0) means no pain, and (10) means worst possible pain. The severity and level of pain that the patient feels in the procedure assessed by usage of the visual analog scale (VAS) at 2 times: At the end of the procedure. At 15 minutes after the procedure.

Patients made a mark on the VAS line to indicate the intensity of pain. The distance from the zero point to the marked point measured using a graduated ruler. Each pain assessment made on a separate line [10].

Patients' satisfaction was evaluated as the percentage of patients who would undergo the examination again using the same method. The time taken to perform the examination measured in minutes, from introduction of the hysteroscope into the vagina until removing it from the cervix.

## Statistical Analysis

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 23. The quantitative data were presented as mean, standard deviations and ranges when parametric and median, inter-quartile range (IQR) when data found non-parametric. Also qualitative variables were presented as number and percentages. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as $P < 0.05$.

**Results** Table (1): Comparison between control group, warm saline group and lidocaine infusion group regarding demographic data and characteristics of the studied patients

| | | Group A (control group) | Group B (warm saline group) | Group C (Lidocaine infusion group) | Test value | P-value | Sig. |
|---|---|---|---|---|---|---|---|
| | | No. = 25 | No. = 25 | No. = 25 | | | |
| Age | Mean ± SD | 35.36 ± 11.77 | 36.68 ± 12.18 | 30.92 ± 9.25 | 1.834• | 0.167 | NS |
| | Range | 19 – 57 | 19 – 58 | 18 – 57 | | | |
| Pre menopouse | | 20 (80.0%) | 20 (80.0%) | 24 (96.0%) | 3.409* | 0.182 | NS |
| Post menopouse | | 5 (20.0%) | 5 (20.0%) | 1 (4.0%) | | | |
| BMI | Mean ± SD | 27.04 ± 4.63 | 27.80 ± 4.41 | 26.04 ± 4.77 | 0.919• | 0.403 | NS |
| | Range | 19 – 35 | 19 – 35 | 19 – 34 | | | |
| Parity | Nulli | 7 (28.0%) | 6 (24.0%) | 10 (40.0%) | 2.115* | 0.715 | NS |
| | Para 1 | 4 (16.0%) | 5 (20.0%) | 5 (20.0%) | | | |
| | Multi | 14 (56.0%) | 14 (56.0%) | 10 (40.0%) | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS) *: Chi-square test; •: One Way ANOVA test The previous table shows that there was no statistically significant difference found between the three studied groups regarding age, menopausal state, BMI and parity with p-value = 0.167, 0.182, 0.403 and 0.715 respectively.

Table (2): Comparison between control group, warm saline group and lidocaine infusion group regarding cycle phase, history of previous uterine procedure, indications and duration by minutes

| | | Group A (control group) | Group B (warm saline group) | Group C (Lidocaina infusion group) | Test value | P-value | Sig. |
|---|---|---|---|---|---|---|---|
| | | No. = 25 | No. = 25 | No. = 25 | | | |
| Cycle phase | NAD | 10 (40.0%) | 10 (40.0%) | 7 (28.0%) | 2.872* | 0.825 | NS |
| | Luteal | 7 (28.0%) | 6 (24.0%) | 7 (28.0%) | | | |
| | Follicular | 6 (24.0%) | 7 (28.0%) | 6 (24.0%) | | | |
| | Ovulation | 2 (8.0%) | 2 (8.0%) | 5 (20.0%) | | | |
| History Of Previous Uterine procedures | NAD | 12 (48.0%) | 12 (48.0%) | 13 (52.0%) | 14.654* | 0.402 | NS |
| | CS | 8 (32.0%) | 5 (20.0%) | 5 (20.0%) | | | |
| | Curretage | 0 (0.0%) | 5 (20.0%) | 5 (20.0%) | | | |
| | Curretage + CS | 0 (0.0%) | 0 (0.0%) | 1 (4.0%) | | | |
| | Polypectomy | 3 (12.0%) | 1 (4.0%) | 1 (4.0%) | | | |
| | Myomectomy | 1 (4.0%) | 1 (4.0%) | 0 (0.0%) | | | |
| | CS + Myomectomy | 1 (4.0%) | 0 (0.0%) | 0 (0.0%) | | | |
| | Myomectomy + curretage | 0 (0.0%) | 1 (4.0%) | 0 (0.0%) | | | |
| Duration by minutes | Mean ± SD | 4.66 ± 2.66 | 5.11 ± 2.19 | 4.68 ± 1.89 | 0.314• | 0.732 | NS |
| | Range | 1.6 – 10 | 2 – 10 | 2 – 9 | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

*:Chi-square test; •: One Way ANOVA test

**Table 2:** Comparison between control group, warm saline group and lidocaine infusion group regarding cycle phase, history of previous uterine procedure, indications and duration by minutes

The previous table shows that there was no statistically significant difference found between the three studied groups regarding cycle phase, history of previous uterine procedure and duration by minutes with p-value = 0.825, 0.402 and 0.732 respectively.

| | | Group A (control group) | | Group B (warm saline group) | | Group C (Lidocaina infusion group) | | Test value* | P-value | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | No. | % | | | |
| Endometrial | NAD | 7 | 28.0% | 10 | 40.0% | 11 | 44.0% | 5.711 | 0.456 | NS |
| | Thin | 7 | 28.0% | 7 | 28.0% | 9 | 36.0% | | | |
| | Thickened | 11 | 44.0% | 7 | 28.0% | 5 | 20.0% | | | |
| | Polypoid | 0 | 0.0% | 1 | 4.0% | 0 | 0.0% | | | |
| Cavity | NAD | 22 | 88.0% | 22 | 88.0% | 21 | 84.0% | 0.231 | 0.891 | NS |
| | Depressed | 3 | 12.0% | 3 | 12.0% | 4 | 16.0% | | | |
| Tubes | Only one | 5 | 20.0% | 7 | 28.0% | 6 | 24.0% | 2.824 | 0.588 | NS |
| | Both not seen | 0 | 0.0% | 2 | 8.0% | 2 | 8.0% | | | |
| | Both seen | 20 | 80.0% | 16 | 64.0% | 17 | 68.0% | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

*:Chi-square test

The previous table shows that there was no statistically significant difference found between the three studied groups regarding endometrial, cavity and tubes findings with p-value = 0.456, 0.891 and 0.588 respectively.

**Table 3:** Comparison between control group, warm saline group and lidocaine infusion group regarding endometrial, cavity and tubes findings

| VAS pain scores | | Group A (control group) | Group B (warm saline group) | Group C (Lidocaine infusion group) | Test value | P-value | Sig. |
|---|---|---|---|---|---|---|---|
| | | No. = 25 | No. = 25 | No. = 25 | | | |
| During procedure | Mean ± SD | 8 (5 – 9) | 5 (3 – 6) | 3 (3 – 4) | 23.568 | 0.000 | HS |
| | Range | 2 – 10 | 2 – 9 | 2 – 8 | | | |
| Mild | | 5 (20.0%) | 10 (40.0%) | 22 (88.0%) | 39.706* | 0.000 | HS |
| Moderate | | 6 (24.0%) | 13 (52.0%) | 2 (8.0%) | | | |
| Severe | | 14 (56.0%) | 2 (8.0%) | 1 (4.0%) | | | |
| After 1 minute | Mean ± SD | 8 (5 – 9) | 5 (3 – 6) | 3 (2 – 4) | 22.737 | 0.000 | HS |
| | Range | 2 – 10 | 2 – 9 | 2 – 7 | | | |
| Mild | | 5 (20.0%) | 12 (48.0%) | 22 (88.0%) | 35.402* | 0.000 | HS |
| Moderate | | 7 (28.0%) | 11 (44.0%) | 3 (12.0%) | | | |
| Severe | | 13 (52.0%) | 2 (8.0%) | 0 (0.0%) | | | |
| After 20 minute | Mean ± SD | 8 (4 – 9) | 5 (3 – 6) | 3 (2 – 4) | 21.965 | 0.000 | HS |
| | Range | 2 – 10 | 2 – 9 | 2 – 7 | | | |
| Mild | | 7 (28.0%) | 12 (48.0%) | 22 (88.0%) | 33.610* | 0.000 | HS |
| Moderate | | 5 (20.0%) | 11 (44.0%) | 3 (12.0%) | | | |
| Severe | | 13 (52.0%) | 2 (8.0%) | 0 (0.0%) | | | |
| **Friedman test** | | **4.512** | **3.000** | **4.667** | | | |
| **P-value** | | **0.105 (NS)** | **0.223 (NS)** | **0.097 (NS)** | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

‡: Kruskal Wallis test

**Table 4:** Comparison between control group, warm saline group and lidocaine infusion group regarding visual analogue scale (VAS) pain score

The previous table shows that there was statistically significant increase in the VAS score in control group (group A) than warm saline group (group B) and lidocaine group (group C) during procedure, after 1 minute and after 20 minutes with p-value <0.001, <0.001 and <0.001) respectively. Also the table shows that there was statistically significant increase in the percentage of patients with severe pain in control group than group B and also in control group than group C at different times of measurement and also statistically significant increase in the percentage of patients with severe pain in group B than group C at different times of measurement. Finally the comparison in each group between during procedure, after 1 minute and after 20 minutes shows that there was no statistically significant change in the VAS in group A, B and C with p-value = 0.105, 0.223 and 0.097.

| VAS pain scores | | Group A (control group) No. = 25 | Group B (warm saline group) No. = 25 | Test value | P-value | Sig. |
|---|---|---|---|---|---|---|
| During procedure | Mean ± SD | 8 (5 – 9) | 5 (3 – 6) | -3.051‡ | 0.002 | HS |
| | Range | 2 – 10 | 2 – 9 | | | |
| Mild | | 5 (20.0%) | 10 (40.0%) | 13.246* | 0.001 | HS |
| Moderate | | 6 (24.0%) | 13 (52.0%) | | | |
| Severe | | 14 (56.0%) | 2 (8.0%) | | | |
| After 1 minute | Mean ± SD | 8 (5 – 9) | 5 (3 – 6) | -2.919‡ | 0.004 | HS |
| | Range | 2 – 10 | 2 – 9 | | | |
| Mild | | 5 (20.0%) | 12 (48.0%) | 11.838* | 0.003 | HS |
| Moderate | | 7 (28.0%) | 11 (44.0%) | | | |
| Severe | | 13 (52.0%) | 2 (8.0%) | | | |
| After 20 minute | Mean ± SD | 8 (4 – 9) | 5 (3 – 6) | -2.789‡ | 0.005 | HS |
| | Range | 2 – 10 | 2 – 9 | | | |
| Mild | | 7 (28.0%) | 12 (48.0%) | 11.632* | 0.003 | HS |
| Moderate | | 5 (20.0%) | 11 (44.0%) | | | |
| Severe | | 13 (52.0%) | 2 (8.0%) | | | |
| **Friedman test** | | **4.512** | **3.000** | | | |
| **P-value** | | **0.105 (NS)** | **0.223 (NS)** | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

‡: Mann Whitney test

**Table 5:** Comparison between control group and warm saline group regarding visual analogue scale (VAS) pain score

The previous table shows that there was statistically significant increase in the VAS score in control group (group A) than warm saline group (group B) during procedure, after 1 minute and after 20 minutes with p-value 0.002, 0.004 and 0.005) respectively. Also the table shows that there was statistically significant increase in the percentage of patients with severe pain in control group than group B at different times of measurement. Finally the comparison in each group between during procedure, after 1 minute and after 20 minutes shows that there was no statistically significant change in the VAS in group A and B with p-value = 0.105 and 0.223.

| VAS pain scores | | Group A (control group) No. = 25 | Group C (Lidocaine infusion group) No. = 25 | Test value | P-value | Sig. |
|---|---|---|---|---|---|---|
| During procedure | Mean ± SD | 8 (5 – 9) | 3 (3 – 4) | -4.389‡ | 0.000 | HS |
| | Range | 2 – 10 | 2 – 8 | | | |
| Mild | | 5 (20.0%) | 22 (88.0%) | 23.970* | 0.000 | HS |
| Moderate | | 6 (24.0%) | 2 (8.0%) | | | |
| Severe | | 14 (56.0%) | 1 (4.0%) | | | |
| After 1 minute | Mean ± SD | 8 (5 – 9) | 3 (2 – 4) | -4.314‡ | 0.000 | HS |
| | Range | 2 – 10 | 2 – 7 | | | |
| Mild | | 5 (20.0%) | 22 (88.0%) | 25.304* | 0.000 | HS |
| Moderate | | 7 (28.0%) | 3 (12.0%) | | | |
| Severe | | 13 (52.0%) | 0 (0.0%) | | | |
| After 20 minute | Mean ± SD | 8 (4 – 9) | 3 (2 – 4) | -4.299‡ | 0.000 | HS |
| | Range | 2 – 10 | 2 – 7 | | | |
| Mild | | 7 (28.0%) | 22 (88.0%) | 21.259* | 0.000 | HS |
| Moderate | | 5 (20.0%) | 3 (12.0%) | | | |
| Severe | | 13 (52.0%) | 0 (0.0%) | | | |
| **Friedman test** | | **4.512** | **4.667** | | | |
| **P-value** | | **0.105 (NS)** | **0.097 (NS)** | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS); ‡: Mann Whitney test

**Table 6:** Comparison between control group and lidocaine infusion group regarding visual analogue scale (VAS) pain score

The previous table shows that there was statistically significant increase in the VAS score in control group (group A) than lidocaine infusion group (group B) during procedure, after 1 minute and after 20 minutes with p-value <0.001, <0.001 and <0.001) respectively. Also the table shows that there was statistically significant increase in the percentage of patients with severe pain

in control group than group C at different times of measurement. Finally the comparison in each group between during procedure, after 1 minute and after 20 minutes shows that there was no statistically significant change in the VAS in group A and C with p-value = 0.105 and 0.097.

| VAS pain scores | | Group B (warm saline group) No. = 25 | Group C (Lidocaina infusion group) No. = 25 | Test value | P-value | Sig. |
|---|---|---|---|---|---|---|
| During procedure | Mean ± SD | 5 (3 – 6) | 3 (3 – 4) | -2.715‡ | 0.007 | HS |
| | Range | 2 – 9 | 2 – 8 | | | |
| Mild | | 10 (40.0%) | 22 (88.0%) | 12.900* | 0.002 | HS |
| Moderate | | 13 (52.0%) | 2 (8.0%) | | | |
| Severe | | 2 (8.0%) | 1 (4.0%) | | | |
| After 1 minute | Mean ± SD | 5 (3 – 6) | 3 (2 – 4) | -2.749‡ | 0.006 | HS |
| | Range | 2 – 9 | 2 – 7 | | | |
| Mild | | 12 (48.0%) | 22 (88.0%) | 9.513* | 0.009 | HS |
| Moderate | | 11 (44.0%) | 3 (12.0%) | | | |
| Severe | | 2 (8.0%) | 0 (0.0%) | | | |
| After 20 minute | Mean ± SD | 5 (3 – 6) | 3 (2 – 4) | -2.677‡ | 0.007 | HS |
| | Range | 2 – 9 | 2 – 7 | | | |
| Mild | | 12 (48.0%) | 22 (88.0%) | 9.513* | 0.009 | HS |
| Moderate | | 11 (44.0%) | 3 (12.0%) | | | |
| Severe | | 2 (8.0%) | 0 (0.0%) | | | |
| **Friedman test** | | **3.000** | **4.667** | | | |
| **P-value** | | **0.223 (NS)** | **0.097 (NS)** | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

‡: Mann Whitney test

**Table 7:** Comparison between warm saline group and lidocaine infusion group regarding visual analogue scale (VAS) pain score

The previous table shows that there was statistically significant increase in the VAS score in warm saline than lidocaine infusion group during procedure, after 1 minute and after 20 minutes with p-value 0.007, 0.006 and 0.007) respectively. Also the table shows that there was statistically significant increase in the percentage of patients with severe pain in warm saline group than lidocaine infusion group at different times of measurement. Finally the comparison in each group between during procedure, after 1 minute and after 20 minutes shows that there was no statistically significant change in the VAS in group B and C with p-value = 0.223 and 0.097.

| | | Nulli No. = 23 | Para 1 No. = 14 | Multi No. = 38 | Test value‡ | P-value | Sig. |
|---|---|---|---|---|---|---|---|
| During procedure | Median (IQR) | 6 (4 - 9) | 4 (4 - 7) | 4 (3 - 6) | 7.539 | 0.023 | S |
| | Range | 3 – 10 | 2 – 9 | 2 – 9 | | | |
| After 1 minute | Median (IQR) | 6 (4 - 9) | 4 (4 - 7) | 4 (3 - 6) | 7.300 | 0.026 | S |
| | Range | 2 – 10 | 2 – 9 | 2 – 9 | | | |
| After 20 minute | Median (IQR) | 6 (4 - 9) | 4 (4 - 7) | 4 (2 - 6) | 7.464 | 0.024 | S |
| | Range | 2 – 10 | 2 – 9 | 2 – 9 | | | |

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

‡: Kruskal Wallis test

**Table 8:** Relation between number of parity and VAS score at different times of measurement

The previous table shows that there was statistically significant increase in the VAS score in nullipara patients than patients with previous one parity and multi-parity during procedure, after 1 minute and after 20 minutes with p-value = 0.023, 0.026 and 0.024; respectively.

## Discussion

Office hysteroscopy is safe, rapid, well tolerated and highly accurate in the diagnosis of excessive uterine bleeding. It permits patients and physicians to discuss more treatment options before surgery including outpatient operating hysteroscopic procedures. Usually, no premedication analgesia or anesthesia is needed so the operation can be performed in the consulting room and on completion of the procedure the patient can immediately return home [12].

Diagnostic hysteroscopy is considered the 'gold standard' in the diagnosis of intrauterine abnormalities [13]. Hysteroscopy is an invasive procedure that is associated with discomfort and is generally performed under local anesthesia. It is an operator dependent technique and its sensitivity is therefore not as optimal as that of a histological examination [14].

Pain experienced during hysteroscopy caused by uterine distension with saline solution. Distending uterus, may release local prostaglandins and initiate uterine cramps and pain during hysteroscopy [15].

Intrauterine anesthesia is a method that had been tried in different gynecologic procedures by some investigators and various data on its effectiveness have been reported [16].

The aim of this work was to evaluate the effect of the effect of intrauterine lidocaine versus warm saline distention medium for pain control during office hysteroscopy.

The present study included 75 women undergo diagnostic outpatient office hysteroscopy in early Cancer detection Endoscopy Gynecology Unit at Ain Shams obstetrics and gynecology hospital. Patients were equally randomly divided into three groups that was age matched.

The mean age of patients in Group A, B and C was (35.36 ± 11.77, 36.68 ± 12.18, 30.92 ± 9.25 years respectively, P>0.167). The results of our study regarding age were comparable to the work of previous studies (17).

In the present work there was no difference between the three groups regarding BMI with mean value 27.04 ± 4.63 in group A, 27.80 ± 4.41 in group B and 26.04 ± 4.77 in group C (P>0.05).

In our study there was no statistically significant difference between the three groups regarding parity, cycle phase, history of previous uterine surgeries, findings or duration of procedure, P value >0.05 this was in agreement with previous study by Guney et al. [17].

In our study there was no statistically significant difference found between the three studied groups regarding endometrial, cavity and tubes findings with p-value = 0.456, 0.891 and 0.588 respectively.

The results of this study showed that the use of intrauterine lidocaine in hysteroscopy applied with the vaginoscopic technique was more effective than warm and room temperature saline distention media in reducing pain during and at 1, 20 min after the procedure ($p < 0.05$).

In this work, there was statistically highly significant decrease mean VAS scores over time in the lidocaine group (Group C) compared to the warm saline distention medium group (Group B) and control group (Group A) during and at 1, 20 min after the procedure p-value <0.001, <0.001 and <0.001) respectively.

As regard pain intensity during the examination, mean value in Group C (lidocaine group) was 3 (3 – 4), and in Group B (warm saline solution group), Group A (control group) was 5 (3 – 6), 8 (5 – 9) respectively. At 1 and 15 minutes after the procedure, pain intensity in Group C was respectively, 3 (2 – 4) and 3 (2 – 4), in Group B was 5 (3 – 6) and 5 (3 – 6) and in Group A was 8 (5 – 9) and 8 (4 – 9). Differences between during procedure, after 1 minute and after 20 minutes in each group show that there was no statistically significant change in the VAS scores in group A, B and C with p-value = 0.105, 0.223 and 0.097.

We demonstrate a reduction in the perception of patient pain associated with the use of 2% intrauterine lidocaine infusion 5 mL.

Intrauterine instillation of local anesthetic has been variably reported to be ineffective or effective in reducing pain associated with an intrauterine procedure when compared with saline in randomized trials, however, in most of the studies, it has been demonstrated to be we more effective [18].

As explained earlier, lidocaine administered into the cavity directly reaches the nerve fibers in the sub endometrial region and more effective analgesia may be provided by this route. This result can also support the need for anesthesia during office diagnostic hysteroscopy [19]. Compared to previous reports in literature, the duration of the procedure in the current study was seen to be short. However, the procedure was considered to have started after visualization of the internal cervical os. Furthermore, as the procedures were short, that may have reduced the pain.

In a prospective, randomized, controlled trial, Cicinelli et al7 found that 2% intrauterine anesthesia 2 mL was able to reduce pain [20].

Hui et al. demonstrated statistically significant reductions in pain when 2% intrauterine anesthesia 5 mL was used before hysteroscopy [21].

Lau et al. found no pain relief in patients receiving 2% intrauterine lidocaine 5 mL for outpatient diagnostic hysteroscopy [22].

These were not in agreement with our results, in which the lidocaine group did have significant pain relief over warm and room temperature groups during and immediately after procedure. The possible explanation for this contradiction could be that the choice of distention medium for hysteroscopy, carbon dioxide, was associated with a higher level of pain during and after the procedure than normal saline solution [23]. Therefore combined hysteroscopy and endometrial biopsy is potentially more uncomfortable than our procedure. Another explanation could be the ethnic and cultural differences between the patient population, which may affect pain perception and tolerance. Another possible explanation could be that pain is difficult to evaluate because it is a symptom and therefore subjective, and anxiety may be a potential confounder. In this study we chose 2% lidocaine for intrauterine anesthetic because it has a quicker onset and shorter duration of action than mepivacaine, which was used in previous studies, and 2% lidocaine might have a theoretical greater efficacy than 1% [23].

In our study there was statistically significant increase in the VAS score in nulliparous patients than patients with previous one parity and multi-parity during procedure, after 1 minute and after 20 minutes with p-value = 0.023, 0.026 and 0.024; respectively.

Previous study revealed that intrauterine lidocaine reduced overall pain during, immediately after, and 20 minutes after the procedure only in the multiparous but not in the nulliparous subjects. The reason for this difference is not clear [16]. We found that nulliparous patients in general were more agitated and had higher pain scores during, immediately after, and 20 minutes after the procedure than multiparous patients. Another possible explanation of this could be that nulliparous patients were expected to experience more pain because of difficulty in entering internal cervical os [24].

Trolice et al randomly assigned 57 perimenopausal and postmenopausal women to receive either intrauterine lidocaine or normal saline before having an office hysterosopy. Five milliliters of 2% lidocaine were infused. They found a statistically significant reduction in pain in women receiving the lidocaine infusion. They concluded that local anesthetic injected into the uterine cavity is effective in decreasing patient pain associated with these intrauterine procedures [20].

In a double- blind randomized controlled trial, Chanrachakul et al. compared the effects of lidocaine and normal saline in pain reduction during office hysteroscopy in 140 women of which 70 received normal saline and other 70 received intrauterine lidocaine. They reported that the intensity of pain was significantly lower in the lidocaine group than in the normal saline group [25].

New approaches that prevent great degrees of pain have emerged including the vaginoscopy examination technique described by Bettocchi and Selvaggi, which does not use a speculum and cervical grasping forceps; and the use of optics and instruments of smaller caliber [11]. Use of paracervical block or anesthetic sprays has not been shown to be effective in diminishing pain during hysteroscopic examination [26].

It's demonstrated in the current study that the use of saline solution warmed to 37.5°C have resulted in lower pain levels because of the lower stimulus for uterine contractility. However, it is noteworthy that the temperature of the distention medium is not the sole stimulus for pain during hysteroscopy

and other stimuli may elicit that pain also. The hysteroscopic examination is performed by introducing a rigid device (the hysteroscope) through the uterine cervix. Because of the innervation of the cervix, it has a painful response to the stimulus of manipulation of the uterus, either because of introducing the instrument through the canal or because of traction [27]. Pain during hysteroscopic examinations has also been correlated with distention of the uterine cavity. The pressure exerted to cause this distention is probably more important than the temperature of the distention medium. These latter painful stimuli clearly does not depend on the temperature of the distention medium used and also may be modified by underlying uterine pathologies, e.g. cervical inflammation or uterine fibroids.

When physiologic saline solution is the distention medium, it is used at room temperature. It is possible that colic provoked by uterine contractility could be triggered by this cooler temperature, which is hostile to the uterus [28].

To be able to reduce and make a more accurate evaluation of the pain associated with the procedure itself, it is necessary to minimize the factors associated with except the cervix or uterine cavity. Experienced physician, using to be able to reduce and make a more accurate evaluation of the pain associated with the procedure itself, it is necessary to minimize the factors associated with except the cervix or uterine cavity. Experienced physician, using small diameter hysteroscope, reaching the cavity quickly and comfortably with minimal trauma can reduce pain [29]. A majority of studies related to pain control in office hysteroscopy have been based on the application of the conventional technique together with procedures such as endometrial biopsy. However, there are relatively few studies related to the necessity for anesthesia in diagnostic hysteroscopy alone [19].

The present study had some limitations. First, it was conducted with a small sample in a single institution. Second, lidocaine was not assessed in lengthy painful operative hysteroscopic interventions.

## Conclusion

Pain is measured by VAS score is significantly lower at the end of the procedure in warm saline distension medium group compared to room temperature distension medium group (1.64+0.82vs 3.05+1.17) respectively. The same finding also after 15 minutes of the end of the procedure (0.35+0.57 vs 1.05+0.81) respectively in warm saline distension medium group and room temperature saline distension medium group. Time taken to complete the procedure in minutes is not significantly different and the result was (2.0-8.0 vs 1.6-9.0 minutes) respectively in warm saline distension medium group and room temperature saline distension medium group.

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