Comparison between the analgesic effect of lidocaine dissolved in distension medium and rectal diclofenac sodium during outpatient hysteroscopy

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Abstract

Background: A clinical technique known as an outpatient hysteroscopy is utilised for a variety of therapeutic and diagnostic purposes. However, discomfort is the most common side effect and reason for procedure failure. Objectives: The aims of this study were: To assess the analgesic efficacy of lidocaine dissolved in the distension medium compared to rectal diclofenac sodium during anesthesia free diagnostic hysteroscopy, and To minimize diagnostic hysteroscopy cancellation due to associated pain. Study Design: This was a comparative randomized observational study conducted at Kasr Alainy Hospital in the outpatient hysteroscopy clinic from November 2018 to November 2019. One hundred nulliparous women who underwent diagnostic office hysteroscopy were divided randomly into 100mg rectal diclofenac group and 10ml of lidocaine 2% dissolved in 500ml saline group The perception of pain was assessed during hysteroscope insertion, visualization of uterine cavity and 30minutes after the procedure using the Visual analogue scale (VAS). The patient was considered in pain with VAS $\geqslant$ 4. Results: Intrauterine instillation of 10 ml lidocaine 2% was inferior to100mg rectal diclofenac in reducing the pain during office hysteroscopy insertion, uterine visualization and 30 minutes after the procedure proved statistically by significant difference (P value < 0.001). Both drugs were tolerable with no observed adverse events. Conclusion: Rectal diclofenac was more effective than intrauterine lidocaine in pain relief during outpatient hysteroscopy.

Keywords: *analgesic, hysteroscopy, lidocaine, rectal diclofenac sodium.*

INTRODUCTION

Office hysteroscopy is preferred by most gynecologists for diagnosis and management of intrauterine pathology because of saving time and costs of hospital admission and escaping anesthesia when compared to operative procedures (1).

Unfortunately, pain and discomfort associated with anesthesia-free office hysteroscopy limit its widespread (2).

There are variable methods to assess pain intensity but visual analogue scale (VAS) is the optimal tool for describing pain severity due to its simplicity, reliability, and validity, as well as its ratio scale properties. It is commonly presented as a 10cm horizontal line on which the patient's pain intensity is represented by a point between the extremes of "no pain at all" and "worst pain imaginable." (3).

Analysis of the neurophysiological mechanism of pain observed during office hysteroscopy has revealed that painful stimuli from the cervix and vagina are transmitted through pudendal and pelvic splanchnic nerves into S2-S4 spinal ganglia and that painful stimuli arising from the uterus are transmitted to T12-L2 spinal ganglia via hypogastric nerves (4).Non-steroidal anti-inflammatory medicines (NSAIDs), opioid analgesics taken orally or intravenously, and local anaesthetics administered intrauterine, paracervically, or topically as a spray, gel, or cream are few analgesic techniques that have been documented for outpatient hysteroscopy (5).

Diclofenac is a type of (NSAIDS) that is known to lessen pain by preventing the production of prostaglandins and cyclooxygenase (6).The aim of our study was to assess the degree of pain relief of lidocaine dissolved in distension medium compared to rectal diclofenac during the diagnostic hysteroscopy.Also, to minimize the out patient hysteroscopy cancellation due to associated pain.

Patients and methods

In our comparative observational study, 100 nulliparous women scheduled to undergo diagnostic office hysteroscopy were included from those attending the Hysteroscopy Outpatient Clinic at Kasr Al Ainy Hospital during the period from November 2018 till November 2019.

Informed consent was taken from the patient about the study according to policy of the Cairo University hospitals. No harmful procedures were performed or used for any patient.

Inclusion criteria: The patients had the following criteria: Nulliparous women and age group (18-35 years).

Exclusion criteria: Pregnant females, females with acute pelvic infection, females with active uterine bleeding, females with operative intervention of accidentally discovered uterine pathology e.g uterine adhesiolysis, myomectomy, or polypectomy) , females with contraindications of diclofenac e.g peptic ulcer, liver and kidney dysfunction and females with lidocaine allergy.

Ethical Approval: The study was approved by the Ethics Board of Cairo University and the patients were given all the information they need about the trial. An informed written consent was taken from each participant in the study. This work was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Methods: All the patients were subjected to the following points:

Written informed consent.

Full history taking: Including the following points: Age, parity, LMP and medical and surgical history.

General examination: It was done including BMI, vital signs and abdominal and pelvic examinations in a form of bimanual and speculum examination to detect any abnormal findings.

Hysteroscopic examination: The division of 100 nulliparous women into two groups for a diagnostic office hysteroscopy was done at random. The allocation sequence was created independently using computer-generated random numbers. Utilizing sequentially numbered opaque sealed envelopes stored with the attending nurse, allocation will be kept secret.

Diclofenac group (n = 50) took 100 mg rectal diclofenac sodium 30 minutes before hysteroscopy. Lidocaine group (n = 50) were given 10 ml of lidocaine 2% dissolved in 500 ml saline (the distension medium).An operator performed diagnostic hysteroscopy on all patients was unaware of the ultrasonography results. This investigation employed Karl Storz hysteroscopy (Germany). It is a rigid continuous flow panoramic hysteroscopy with a 30° fibroptic lens, a 4 mm outer sheath, and a length of 25 cm. The metal halide automated light source from Circon Acmi G71A/Germany with a 150 Watt bulb was employed as the light source in this study. The hysteroscope is attached to the light source by a fibroptic cable. Attaching plastic bags of normal saline was the method employed to maintain uterine distention. With manometric control, a pneumatic cuff raises the infusion pressure to between 100 and 120 mm HG.

The procedure was monitored using a single chip video and the image is displayed on a monitor visible to the operator. The camera is karl Storz Germany with a focal length varies from f 70 to f 140.

Steps of the procedure: The lithotomy posture was adopted for the patient.

Complete the aseptic method by using a non-foaming aseptic solution to clean the region around the vulva, vagina, and cervix. Hysteroscope insertion into uterine cavity follows cervix visualisation and vaginal approach identification of the external os. A panoramic picture of the uterine cavity is visible once the cavity has been opened, and the uterus' fundus, anterior, posterior, and lateral walls were all examined sequentially before the uterotubal junctions were visualised. Any submucus fibroids, polyps, septa, adhesions, or uterine malformations were observed. If appropriate vision was not achieved or the pain became intolerable, the treatment was discontinued. The hysteroscope was slowly withdrawn into the cervical canal at the conclusion of the surgery. The attending nurse gave the woman a VAS (visual analogue scale), and she was instructed to mark the point on the 10 cm graph that corresponded to her pain on each of three occasions: during the insertion of the hysteroscope, during visualisation of the uterine cavity, and 30 minutes after the procedure.

Possible risks: Complications of hysteroscopy e.g uterine perforation and bleeding. Side effects of drug used e.g allergy and gastritis.

Outcomes: Primary outcome: To assess the degree of pain relief of lidocaine dissolved in distension medium compared to rectal diclofenac during the diagnostic hysteroscopy. Secondary outcomes: To assess the degree of operator’s comfort during the diagnostic

hysteroscopy and To minimize procedure cancellation due to associated pain.

Results

100 nulliparous women who had diagnostic office hysteroscopy were split into two groups at random. The allocation sequence will be created independently by a third party utilising machine generated random numbers. Utilizing sequentially numbered opaque sealed envelopes stored with the attending nurse, allocation will be kept secret.

Table (1): Demographics (Age, BMI)

	Lidocaine group		Diclofenac sodium group		
	Mean	Standard Deviation	Mean	Standard Deviation	P value
Age	27.36	3.32	27.80	4.05	0.554
BMl	29.20	3.33	29.22	3.57	0.977

Table (2): Indication of outpatient hysteroscopy

		Lidocaine group		Diclofenac sodium group		P value
		Count	%	Count	%	
Indication	**1ry infertility**	19	38.0%	26	52.0%	0.334
	Abnormal uterine bleeding	20	40.0%	14	28.0%	
	recurrent abortion	11	22.0%	10	20.0%	

The commonest indication was primary infertility.

Table (3): Finding visualised during outpatient hysteroscopy

		Lidocaine group		Diclofenac sodium group		P value
		Count	%	Count	%	
Finding	**enometrial polyp**	8	16.0%	4	8.0%	0.195
	septate uterus	4	8.0%	2	4.0%	
	submucus fibroid	4	8.0%	1	2.0%	
	No Abnormality	34	68.0%	43	86.0%	

Abnormal uterine cavity finding was noticed in 23% of all cases.

Table (4): Duration of outpatient hysteroscopy

	Lidocaine group		Diclofenac sodium group		
	Mean	Standard Deviation	Mean	Standard Deviation	P value
Duration	5.60	1.29	5.20	1.16	0.107

The mean duration of hysteroscopy was 5.6 ± 1.29 in the lidocaine group and was 5.2 ± 1.16 in diclofenac group.

Table (5): Pain score at insertion, during procedure and 30 minutes after procedure

	Lidocaine group		Diclofenac sodium group		
	Mean	Standard Deviation	Mean	Standard Deviation	P value
Pain at insertion	6.20	0.95	4.90	0.84	<0.001
Pain at procedure	5.40	0.95	4.08	0.80	<0.001
Pain 30minutes After procedure	3.74	1.12	1.70	1.09	<0.001

This table shows highly statistically significant difference in pain score between lidocaine and Diclofenac groups at insertion of hysteroscope, during procedure and 30minutes after procedure.

Pain is more tolerated in Diclofenac group.

Table (6): Degree of Pain according to visual analogue scale (VAS) at insertion, during procedure and 30 minutes after procedure

		Lidocaine group		Diclofenac sodium group		P value
		Count	%	Count	%	
Pain at insertion	**Mild**	0	0.0%	2	4.0%	< 0.001
	moderate	34	68.0%	48	96.0%	
	Severe	16	32.0%	0	0.0%	
Pain at procedure	**Mild**	0	0.0%	13	26.0%	< 0.001
	moderate	45	90.0%	37	74.0%	
	Severe	5	10.0%	0	0.0%	
Pain 30min. After procedure	**No**	0	0.0%	10	20.0%	< 0.001
	Mild	21	42.0%	40	80.0%	
	moderate	29	58.0%	0	0.0%	

This table shows that 32% of lidocaine group had severe pain in comparison to absence of severe pain in Diclofenac group at insertion. Also, It shows that 90% of lidocaine group had moderate pain in comparison to 74% in Diclofenac group. 30 minutes after procedure

58% of lidocaine group had moderate pain in comparison to absence of moderate pain in Diclofenac group.

Fig (1) shows the comparison of pain score between lidocaine and diclofenac groups during the procedure.

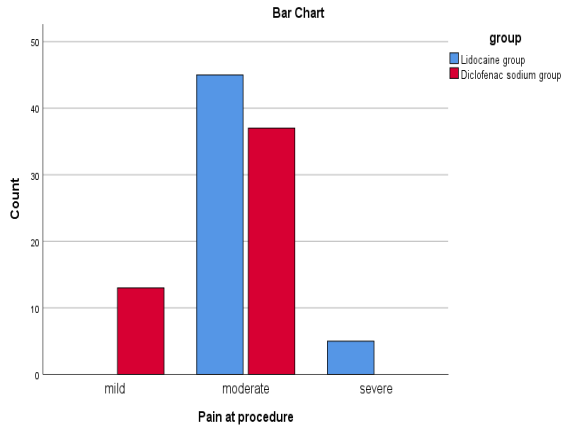
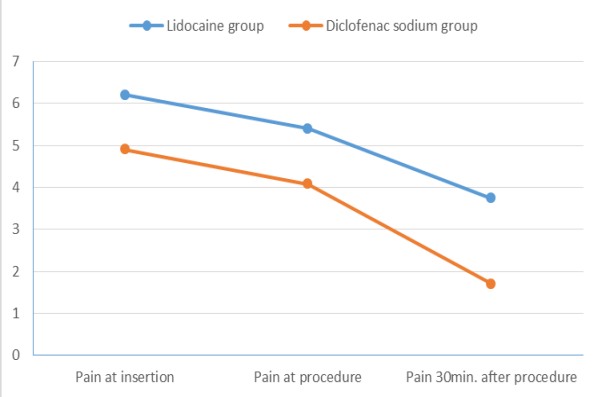


Fig (2) shows the comparison of pain score between lidocaine and diclofenac groups



Discussion

Multiple studies discussed methods of pain control with diagnostic hysteroscopy. These include modifications of the technique (avoiding tenaculum use, using vaginoscope, and cervical hydrodistension) and pharmacological options e.g., opioids, non-steroidal anti-inflammatory drugs, and local anesthesia (1).

Unfortunately, the results of these previous studies are highly conflicting due to the study design, small number of cases and different types of analgesics. This was one of important causes that motivated us to perform this study.

In our randomized double-blinded controlled study conducted between November 2018 and November 2019 at the outpatient hysteroscopy clinic of Kasr Al Ainy Hospital. 100 nulliparous women aged 18 – 35 years underwent diagnostic office hysteroscopy were randomized into two groups, one of which received 100 mg rectal diclofenac sodium 30 minutes before hysteroscopy, and the other group received 10 ml of lidocaine 2% dissolved in 500 ml saline (the distension medium).

Our study's objective was to assess the effectiveness of rectal diclofenac and intrauterine lidocaine instillation for reducing discomfort in nulliparous women undergoing outpatient diagnostic hysteroscopy.

Our rationale for using lidocaine dissolved in the distension medium was that it might provide better analgesic effect during and after the outpatient diagnostic hysteroscopy. Moreover, intrauterine instillation was preferred over intracervical and paracervical injection as it avoids the danger of bleeding or extravasation of local anesthetic.

Also, we used normal saline for uterine distention as it has been reported to produce less discomfort compared to CO2 and glycine (7).

To achieve our goal we compared both groups as regards many variables as seen below.

Regarding the demograghic data in our study, there was no statistically significant difference between both groups as regards age of women included, with mean age of 27.3 and 27.8 years in lidocaine and the diclofenac sodium groups

respectively, which is considered important to exclude the effect of age on the results. Also, there was no statistically significant difference as regards body mass index with mean of (29.2 ± 3, 3) in lidocaine group and (29.2 ± 3,5) in diclofenac group, which is important to exclude effect of BMI on the dose needed . The mean age of our study patients is close to that of Mohammadi et al. (8) and El-Houssieny et al. (9) studies, but is markedly lower than that of Cicinelli et al. (2), Olad-Saheb-Madarek et al. (10), Senturk et al. (11) and Samy et al. (12) studies. El-Houssieny et al. (9) reported an association between hysteroscopy associated pain and patients' age who found that older women had higher pain score(P value =0.021).

Regarding the parity in our study, only nulliparous women were included to avoid the effect of multiparity regarding cervical changes which agree with Mohammadi et al. (7) and El-Gamal et al., (13) studies. However, other studies included multiparous women, such as Lau et al. (14) and Olad-Saheb-Madarek et al. (10) studies.

Regarding the indication of diagnostic hysteroscopy in our study, the most common indication for outpatient hysteroscopy was primary infertility (52%) followed by abnormal uterine bleeding (28%) then recurrent abortions (20%). Importantly, there were no statistically significant differences in indications of hysteroscopy between the two study groups.

Regarding abnormal finding during diagnostic hysteroscopy in our study, they were detected in 23% of cases in our study and there was no statistically significant difference between both groups. These included endometrial polyp (12%), septate uterus (6%), and submucous fibroid (5%). These findings are generally in line with previous studies using outpatient diagnostic hysteroscopy.

Regarding the duration of diagnostic hysteroscopy in our study, the mean duration was longer in the lidocaine group (5.6) than in the diclofenac sodium group(5.2), however the difference was statistically insignificant which is important as long procedure is more likely to elicit more discomfort and pain. This is generally in accordance with Mohammadi et al. (8), El-Gamal et al. (13), Barel et al. (15) studies.

Regarding VAS during diagnostic hysteroscopy in our study, intrauterine instillation of lidocaine is inferior to rectal diclofenac in reducing the pain proved statistically by significant difference(P value < 0.001), either at insertion, during uterine visualization, and 30 minutes after the procedure.

The differences in the degree of perceived pain were highly pronounced as 32% of patients in the lidocaine group had severe pain (VAS >7) at insertion, but none in the diclofenac sodium group. Moreover, 10% of the lidocaine group had severe pain during the procedure, but none in the diclofenac sodium group. Last, 58% of the lidocaine group had moderate pain (VAS >4) 30 minutes after the procedure, but none in the diclofenac sodium group.

Our results agree with the study done by Lau et al. (14) who found that instillation of 5mL of 2% lignocaine into the uterine cavity before hysteroscopy was not effective in decreasing hysteroscopy-related pain. Also, Kabli & Tulandi, (16) found that lidocaine diluted in the distension medium when compared with placebo was not effective.

Also, our results agree with El-Houssieny et al. (9) who conducted a randomized controlled study on 200 nulliparous women who underwent outpatient hysteroscopy. Transcervical intrauterine instillation of 5 ml

2% lidocaine was inferior to 100 mg rectal diclofenac in reducing pain associated with hysteroscopy (P value <0.001).

Our results were further confirmed by the findings of El-Gamal et al. (13) who found that 10ml of lidocaine2% dissolved in distension medium has significantly higher pain scores than oral diclofenac group during hysteroscopic insertion (Pvalue<0.017).

Incontrast, many studies didn't agree with our study (2, 17, 18).

However, accuracy of these studies may be limited by variation in many items regarding (age of women, undilution of anaethetic, use of different drug, route of administration and comparison to placebo instead of stronger analgesic).

Although, Trolice et al. (19) study experienced significantly lower pain on 41 premenopausal and postmenopausal women who had 5mL of 2% lidocaine instilled in their uteri before endometrial biopsies compared with the placebo group, small number of cases affects its strength.

Regarding the technique of procedure, Olad-Saheb-Madarek et al. (10) found that when lidocaine was administrated via angiocatheter which was left 3minutes intracervical to prevent backflow, it was effective in reducing pain but its accuracy is limited by multiparity and older women included (40-55) years old.

Although, Samy et al. (12) According to a study, the accuracy of pain levels during and 10 minutes after the treatment with lidocaine infusion is influenced by the age of the women who participated (menopausal). Even though Barel et al. (15) study found that using 10 mL of lidocaine 2% added to 1000 mL of saline (distension medium) for an outpatient diagnostic hysteroscopy using a vaginal approach significantly reduced perceived pain after the procedure compared with a placebo, it wasn't compared to a stronger analgesic.

From all the previously stated studies, it is obvious now that there is a great discrepancy in results of different studies partly explained by differences in study populations (number of cases, Age and Parity), type and diameter of hysteroscopy, technical steps (tenaculum grasping of cx and intracervical catheter), dose of lidocaine and experience.

However, our study has some limitations e.g lack of placebo controlled group, lack of combined effect of intrauterine lidocaine and rectal diclofenac sodium and and lack of evaluation of other secondary outcome measures like operator comfort.

Conclusion

Our primary outcome was to study the efficiency of intra uterine lidocaine and rectal diclofenac in pain control through the VAS system during the diagnostic hysteroscopy. According to our research, rectal diclofenac relieves pain better than intrauterine lidocaine at the time of insertion, throughout the procedure, and for 30 minutes afterward.

Declarations:

Consent for publication: I attest that all authors have agreed to submit the work.

Availability of data and material: Available

Competing interests: None

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