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Effectiveness of Intrauterine Lignocaine in Addition to Paracervical Block for Pain Relief During Dilatation & Curettage and Fractional Curettage

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ABSTRACT

Background: Dilatation and curettage (D&C) and fractional curettage are commonly performed gynaecological procedures associated with significant pain and discomfort. Although the paracervical block is widely used for pain relief, it may not provide complete analgesia during intrauterine manipulation. Intrauterine lignocaine instillation may enhance analgesic efficacy and improve patient comfort.
Aim: To evaluate the effectiveness of intrauterine lignocaine in addition to paracervical block for pain relief during dilatation and curettage and fractional curettage procedures.
Materials and Methods: This prospective randomised comparative study included 60 female patients aged 20–60 years belonging to ASA grade I–III undergoing D&C and fractional curettage procedures. Patients were randomly divided into two groups of 30 each. Group A received 5 mL of 2% intrauterine lignocaine, while Group B received 5 mL of normal saline intrauterine, along with a paracervical block in both groups. Pain was assessed using the Visual Analogue Scale (VAS) at the time of curettage, immediately after the procedure, and 30 minutes post-procedure. Hemodynamic parameters, including heart rate, systolic blood pressure, diastolic blood pressure, and oxygen saturation, were recorded.
Results: Pain scores were significantly lower in Group A compared to Group B at all observation intervals. At the time of curettage, Group A showed a mean pain score of 2.3 ± 1.09 compared to 5.3 ± 0.95 in Group B. Immediately post-procedure and 30 minutes after the procedure, pain scores remained significantly lower in Group A. Hemodynamic parameters, including heart rate, systolic blood pressure, and diastolic blood pressure, were more stable in Group A. No major complications were observed in either group.
Conclusion: Intrauterine lignocaine instillation in addition to paracervical block provides effective pain relief and better hemodynamic stability during dilatation and curettage and fractional curettage procedures. It is a simple, safe, economical, and effective adjunct for improving patient comfort during gynaecological procedures.

Keywords*: Intrauterine lignocaine, paracervical block, dilatation and curettage, fractional curettage, pain relief, visual analogue scale.*

INTRODUCTION

Dilatation and curettage (D&C) and fractional curettage are among the most commonly performed gynaecological procedures for both diagnostic and therapeutic purposes. These procedures are indicated in conditions such as abnormal uterine bleeding, infertility evaluation, postmenopausal bleeding, retained products of conception, and endometrial assessment. Despite being short-duration procedures, they are frequently associated with considerable pain and discomfort due to cervical dilatation and intrauterine manipulation. Adequate pain control during these procedures is therefore essential for patient comfort, procedural success, and maintenance of hemodynamic stability (1).

Pain during D&C mainly originates from cervical dilatation and curettage of the uterine cavity. The cervix is innervated through the Frankenhauser ganglion, while pain from the uterine body is transmitted through sympathetic fibres entering the spinal cord at T10–L1 levels (2). Various techniques have been employed for pain management during these procedures, including general anaesthesia, intravenous sedation, spinal anaesthesia, paracervical block, and local anaesthetic instillation into the uterine cavity (3).

Paracervical block is a commonly used and effective method for pain relief during gynaecological procedures because it is simple, inexpensive, and associated with fewer systemic complications. However, paracervical block alone may not provide complete analgesia during intrauterine manipulation because it primarily blocks cervical pain pathways and may inadequately suppress pain arising from the uterine cavity (4). Consequently, many patients continue to experience moderate pain during curettage.

Intrauterine lignocaine instillation has emerged as a useful adjunct for pain relief during gynaecological procedures. Lignocaine acts by blocking sodium channels and preventing nerve impulse conduction in sensory nerve fibres. Direct instillation into the uterine cavity provides topical anaesthesia to the endometrial surface and uterine nerve endings, thereby reducing pain during instrumentation (5).

Several studies have evaluated the efficacy of intrauterine lignocaine in outpatient gynaecological procedures. Chanrachakul et al. demonstrated that intrauterine lignocaine significantly reduced pain during fractional curettage procedures (6). Trolice et al. also reported improved analgesia with intrauterine lidocaine during endometrial biopsy (7). Similarly, Lau et al. observed decreased pain scores and improved patient comfort with intrauterine lignocaine administration during gynecological interventions (8).

Considering the need for effective and safe analgesia during D&C and fractional curettage, the present study was undertaken to evaluate the effectiveness of intrauterine lignocaine in addition to paracervical block for pain relief during these procedures. The study aimed to compare pain scores, hemodynamic parameters, and perioperative complications between patients receiving intrauterine lignocaine and those receiving normal saline along with paracervical block.

MATERIALS AND METHODS

This prospective randomised comparative study was conducted after obtaining approval from the Institutional Ethics Committee and written informed consent from all participants. A total of 60 female patients belonging to American Society of Anesthesiologists (ASA) physical status I, II, and III, aged between 20 and 60 years, scheduled for dilatation and curettage (D&C) and fractional curettage procedures of approximately 30 minutes duration were enrolled in the study.

The patients were randomly allocated into two groups of 30 patients each:

- Group A: Received 5 mL of 2% lignocaine intrauterine instillation.
- Group B: Received 5 mL of normal saline intrauterine instillation.

Inclusion Criteria

1. Female patients aged 20–60 years.
2. ASA physical status I–III.
3. Patients undergoing dilatation and curettage or fractional curettage procedures.
4. Duration of procedure approximately 30 minutes.

Exclusion Criteria

1. Cerebrovascular disorders.
2. Previous surgery on the cervix.
3. History of pelvic radiotherapy.
4. Active pelvic inflammatory disease.
5. Endometrial polyp.
6. Submucosal fibroid.
7. Uterine size greater than 10 weeks.
8. Previous history of allergic reaction to lignocaine or NSAIDs.

Preanaesthetic Assessment

All patients underwent detailed preanaesthetic evaluation on the previous day of surgery. A structured proforma was used for assessment and documentation.

Demographic details including name, age, diagnosis, type of surgery, weight, register number, ASA grade, and date of surgery were recorded.

General physical examination included assessment of built and nourishment, pallor, clubbing, icterus, edema, cyanosis, skin condition, jugular venous pressure (JVP), and lymphadenopathy. Systemic examination of the respiratory system (RS), cardiovascular system (CVS), central nervous system (CNS), oral cavity, Mallampati grading (MPG), and spine examination was performed.

Baseline vital parameters including temperature, pulse rate, respiratory rate, blood pressure, and peripheral oxygen saturation (SpO_2) were recorded.

Routine investigations performed in all patients included:

- Hemoglobin (Hb)
- Urine examination
- Random Blood Sugar (RBS)
- Blood urea
- Serum creatinine
- Electrocardiography (ECG)
- Chest X-ray (CXR)

Preoperative Preparation

All patients were kept fasting for 6 hours prior to the procedure. After shifting the patient to the operating room, intravenous access was secured and standard monitors including non-invasive blood pressure (NIBP), ECG, and pulse oximeter were attached. Baseline hemodynamic parameters were recorded before administration of premedication.

All patients in both groups received the following intravenous premedications:

- Inj. Glycopyrrolate 4 µg/kg IV slowly
- Inj. Ondansetron 80 µg/kg IV slowly
- Inj. Midazolam 20 µg/kg IV slowly

Technique

All patients received an oral NSAID one hour prior to the procedure. Following premedication, a paracervical block was administered using 10 mL of 1% lignocaine injected through a 23-gauge disposable syringe at the 3 o'clock and 9 o'clock positions of the cervicovaginal junction at approximately 1 cm depth after careful aspiration to avoid inadvertent intravascular injection.

Subsequently, intrauterine instillation was performed using an 8–12 Fr pediatric Foley catheter as follows:

- Group A: Received 5 mL of 2% lignocaine intrauterine.
- Group B: Received 5 mL of normal saline intrauterine.

The catheter was kept in place for approximately 2 minutes before removal to minimise backflow and ensure adequate contact time for the anaesthetic agent.

Intraoperative Monitoring

Hemodynamic parameters, including pulse rate, blood pressure, and peripheral oxygen saturation (SpO_2) were monitored and recorded at the following intervals:

1. At the time of curettage.
2. Immediately after the procedure.
3. Thirty minutes after the procedure.

The total duration of the procedure was also noted.

Pain Assessment

Pain intensity was assessed using the Visual Analogue Scale (VAS) at the following time intervals:

1. At the time of curettage.
2. Immediately post-procedure.
3. Thirty minutes after the procedure.

Pain scores were categorized as follows:

VAS Score	Pain Severity
0	No pain
1–3	Mild pain
4–6	Moderate pain
7–10	Severe pain

Complications
Patients were monitored for perioperative complications, including:

- Nausea
- Vomiting
- Hypotension
- Bradycardia

Statistical Analysis
The collected data were compiled, tabulated, and analysed using appropriate statistical methods. Quantitative variables were expressed as mean ± standard deviation and analysed using Student's *t*-test, whereas qualitative variables were analysed using the Chi-square test. A *p-value* greater than 0.05 was considered statistically not significant, a *p-value* less than 0.05 was considered statistically significant, and a *p-value* less than 0.01 was considered highly significant.

OBSERVATIONS AND RESULTS
A total of 60 patients were included in the study and randomly divided into two groups of 30 patients each.

- Group A: Received 5 mL of 2% intrauterine lignocaine.
- Group B: Received 5 mL of intrauterine normal saline.

Table 1: Comparison of Age Distribution and Weight of Patients in Group A and Group B

Parameter	Group A	Group B	P value
Mean Age (years)	32 ± 9.2	34 ± 9.3	>0.05
Mean Weight (kg)	55 ± 5.77	58 ± 4.2	>0.05

The mean age of patients in Group A was 32 ± 9.2 years and in Group B was 34 ± 9.3 years. The difference between the two groups was statistically not significant. Similarly, the mean weight in Group A was 55 ± 5.77 kg and in Group B was 58 ± 4.2 kg, which was also statistically not significant.

Table 2: Comparison of Oxygen Saturation (SpO_2%) Between Group A and Group B

Time Interval	Group A Mean ± SD	Group B Mean ± SD	P value
Before Premedication	98.6 ± 0.47	98.8 ± 0.34	>0.05
At Time of Curettage	98.7 ± 0.44	98.8 ± 0.37	<0.05
Immediately Post Procedure	98.7 ± 0.43	98.9 ± 0.30	<0.05
30 Minutes After Procedure	98.6 ± 0.49	98.6 ± 0.48	<0.05

The oxygen saturation levels remained comparable in both groups throughout the study period. The difference before premedication was statistically not significant. However, statistically significant differences were observed at the time of curettage, immediately after the procedure, and 30 minutes after the procedure.

Table 3: Comparison of Heart Rate Between Group A and Group B

Time Interval	Group A Mean ± SD	Group B Mean ± SD	P value
Before Premedication	92.2 ± 10.40	95.6 ± 12.98	>0.05
At Time of Curettage	97.6 ± 12.43	101.4 ± 10.29	<0.05
Immediately Post Procedure	97.13 ± 10.88	99.6 ± 9.95	<0.05
30 Minutes After Procedure	95.2 ± 8.37	95.3 ± 9.19	<0.05

The baseline heart rate before premedication was comparable between the two groups and the difference was statistically not significant. At the time of curettage, immediately after the procedure, and 30 minutes after the procedure, Group A showed lower mean heart rates compared to Group B, and the differences were statistically significant.

Table 4: Comparison of Systolic Blood Pressure (SBP) Between Group A and Group B

Time Interval	Group A Mean ± SD	Group B Mean ± SD	P value
Before Premedication	128.6 ± 7.30	131.3 ± 6.81	>0.05
At Time of Curettage	118.6 ± 10.9	134.3 ± 6.78	<0.05
Immediately Post Procedure	115.6 ± 7.73	130.6 ± 7.84	<0.05
30 Minutes After Procedure	115.3 ± 7.76	126.3 ± 7.18	<0.05

The baseline systolic blood pressure before premedication was comparable between the two groups and the difference was statistically not significant. At the time of curettage, immediately post-procedure, and 30 minutes after the procedure, systolic blood pressure was significantly lower in Group A compared to Group B.

Table 5: Comparison of Diastolic Blood Pressure (DBP) Between Group A and Group B

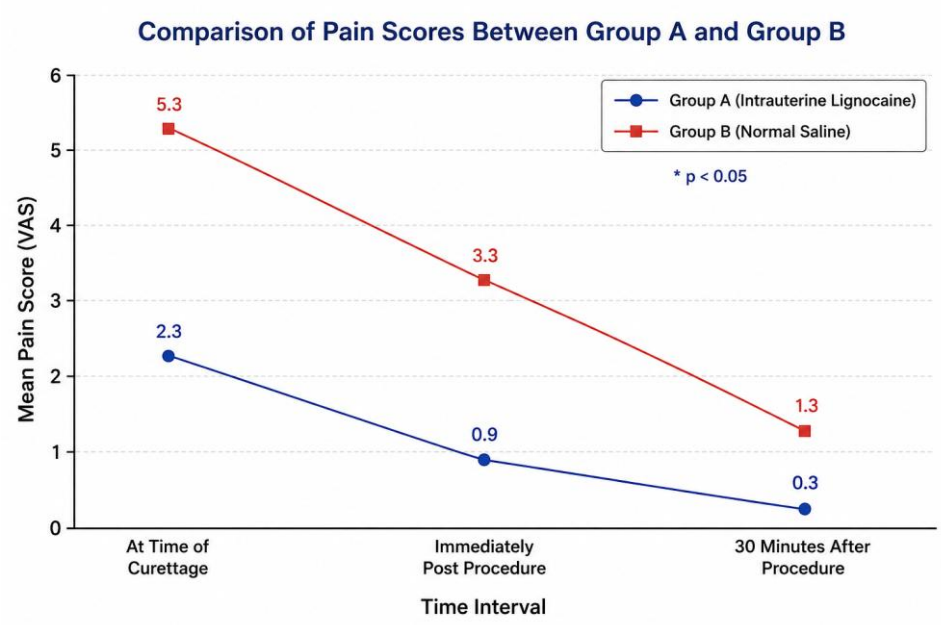
Time Interval	Group A Mean ± SD	Group B Mean ± SD	P value
Before Premedication	**82.6 ± 14.94**	**86.3 ± 7.18**	**>0.05**
At Time of Curettage	**78.3 ± 6.98**	**86.6 ± 7.11**	**<0.05**
Immediately Post Procedure	**77.6 ± 7.27**	**85.3 ± 5.07**	**<0.05**
30 Minutes After Procedure	**79.3 ± 7.39**	**82.3 ± 11.65**	**<0.05**

There was no statistically significant difference in baseline diastolic blood pressure between the two groups before premedication. However, at the time of curettage, immediately post procedure, and 30 minutes after the procedure, Group A demonstrated significantly lower diastolic blood pressure values compared to Group B.

Table 6: Comparison of Pain Scores Between Group A and Group B

Time Interval	Group A Mean ± SD	Group B Mean ± SD	P value
At Time of Curettage	**2.3 ± 1.09**	**5.3 ± 0.95**	**<0.05**
Immediately Post Procedure	**0.9 ± 1.06**	**3.3 ± 0.95**	**<0.05**
30 Minutes After Procedure	**0.3 ± 0.18**	**1.3 ± 0.92**	**<0.05**

Pain scores were significantly lower in Group A compared to Group B at all observation intervals. At the time of curettage, Group A had a mean pain score of 2.3 ± 1.09 compared to 5.3 ± 0.95 in Group B. Immediately after the procedure and 30 minutes post-procedure, pain scores remained significantly lower in Group A, indicating superior analgesic efficacy of intrauterine lignocaine when used in addition to paracervical block.



DISCUSSION

Dilatation and curettage and fractional curettage are commonly associated with pain and discomfort due to cervical dilatation and endometrial manipulation. Effective perioperative analgesia is therefore important to improve patient comfort, reduce anxiety, and maintain hemodynamic stability. The present study was conducted to evaluate the effectiveness of intrauterine lignocaine instillation in addition to paracervical block for pain relief during these gynecological procedures.

In the present study, both groups were comparable with respect to demographic characteristics such as age and weight. The mean age and body weight differences between Group A and Group B were statistically not significant, indicating that both groups were comparable for evaluation of analgesic efficacy. Similar demographic comparability has been reported in previous studies assessing intrauterine lignocaine during gynecological procedures (6,7).

Pain assessment using the Visual Analogue Scale (VAS) demonstrated significantly lower pain scores in patients receiving intrauterine lignocaine in addition to paracervical block. At the time of curettage, Group A showed a mean pain score of 2.3 ± 1.09 compared to 5.3 ± 0.95 in Group B. Immediately after the procedure and 30 minutes post-procedure, pain scores remained significantly lower in Group A. These findings indicate that intrauterine lignocaine provides superior analgesia when used as an adjunct to paracervical block.

The findings of the present study are consistent with the observations of Chanrachakul et al., who reported significant reduction in pain during fractional curettage following intrauterine lignocaine instillation (6). Trolice et al. also observed improved pain control during endometrial biopsy procedures with intrauterine lidocaine administration (7). Lau et al. similarly reported reduced pain scores and improved patient tolerance in outpatient gynecological procedures using intrauterine lignocaine (8).

The mechanism of analgesia may be attributed to the local anesthetic action of lignocaine on the endometrial nerve endings and uterine sensory pathways. While paracervical block mainly blocks cervical pain transmission, intrauterine lignocaine directly anesthetizes the uterine cavity and endometrium, thereby providing additional pain relief during curettage and uterine manipulation (4).

In the present study, heart rate, systolic blood pressure, and diastolic blood pressure were significantly lower in Group A during and after the procedure compared to Group B. These findings indicate better attenuation of pain-induced sympathetic responses in patients receiving intrauterine lignocaine. Similar hemodynamic stability associated with improved analgesia has been reported in previous studies evaluating local anesthetic techniques in gynecological procedures (8,9).

Oxygen saturation remained within normal limits in both groups throughout the study period, indicating that the procedure and anesthetic techniques were safe and did not cause respiratory compromise. No serious complications such as severe hypotension, bradycardia, or allergic reactions were observed. These findings are comparable with studies conducted by Tangsiriwatthana et al., who concluded that paracervical block with local anesthetic techniques is safe and effective for cervical and uterine interventions (9).

The advantages of intrauterine lignocaine include ease of administration, rapid onset of action, low cost, minimal systemic adverse effects, and suitability for outpatient procedures. The addition of intrauterine lignocaine to paracervical block therefore appears to provide effective multimodal analgesia during D&C and fractional curettage.

However, the present study had certain limitations. The sample size was relatively small, and the study was conducted at a single institution. Long-term postoperative pain relief and patient satisfaction scores were not evaluated. Further multicentric studies with larger sample sizes are recommended to validate these findings.

Overall, the present study demonstrates that intrauterine lignocaine instillation in addition to paracervical block significantly reduces pain scores and provides better hemodynamic stability during dilatation and curettage and fractional curettage procedures.

CONCLUSION

The present study concludes that intrauterine lignocaine instillation in addition to paracervical block provides effective pain relief during dilatation and curettage and fractional curettage procedures. It significantly reduces pain scores and provides better hemodynamic stability compared to paracervical block alone. Intrauterine lignocaine is a simple, safe, economical, and effective adjunct for improving patient comfort during gynecological procedures.

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