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Effectiveness Of Paracervical Block In Comparison To Paracervical Block With Intrauterine Lignocaine As Analgesia For Uterine Curettage – A Randomized Clinical Study

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ABSTRACT

Background: *Dilatation and curettage (D&C) is a commonly performed gynecological OPD procedures used for both diagnostic and therapeutic purposes which were earlier done in the OT. A major obstacle in completion of outpatient uterine curettage procedure is pain. Alleviation of pain is the most important part and for the same several different methods have been explored to improve the success rate.*

Objectives: *The aim is to study the effect of intrauterine lignocaine in addition to paracervical block compared to paracervical block as an analgesia during uterine curettage. It also aims to compare changes in non invasive blood pressure and pulse rate in both the groups, to compare the complications and side effects between the two groups and to assess the need for additional analgesia*

Methods: *This is a randomized control clinical study, done over a period of 18 months on 100 women on OPD basis in the Department of Obstetrics and Gynaecology. The study included 2 groups with 50 women in each group. Group 1 received paracervical block(PCB) and Group 2 received PCB with intrauterine lignociane instillation. D&C is carried out and pain scores are noted using VAS. Pulse rate, blood pressure, side effects, requirement of additional analgesia is compared between the two groups.*

Results: *The patients in both groups were well matched for age, parity, body mass index.At all three sages, pain perceived in group 2 was significantly less compared to group 1 ($p<0.0001$). The change in pulse rate and blood pressure were much less in the Group 2 compared to group 1.*

Conclusion: *The study offers promising insights into the benefits of adding Intra Uterine Lignocaine to Paracervical block, particularly in terms of pain management and patient comfort. Also, adding 2% intrauterine lignocaine to the paracervical block does not enhance the adverse effects, it is a safe and cost effective method. However, future research with larger sample sizes, longer follow-up periods, and more diverse populations is necessary to confirm.*

Keywords: *Intrauterine lignocaine, Paracervical block, D&C, VAS*

INTRODUCTION

Dilatation and curettage (D&C) and fractional curettage (F/C) are two commonly performed gynecological procedures used for both diagnostic and therapeutic purposes which were traditionally done in the operation theatre but are now routinely performed in the outpatient department (OPD) because of increasing work load and relative lack of time[1].

Endometrial sampling is a diagnostic tool that is frequently applied in outpatient clinics for many gynaecologic disorders. It has a wide range of indications, including abnormal uterine bleeding, postmenopausal bleeding, abnormal cytology, hormone replacement therapy monitoring, and infertility[2].

A major obstacle in completion of outpatient uterine curettage procedure is pain. Alleviation of pain is the most important part and for the same several different methods have been explored to improve the success rate. Though general anaesthesia can be offered for complete analgesia, because of its own risks and complications local anaesthesia is preferred which saves lot of time, preparation and reduces financial burden.

Paracervical block has routinely been used for pain reduction during gynaecological procedures since 1925 but the pain intensity when block is given is still considered as moderate only[3].The paracervical block relieves pain in the lower part of the uterus and cervix by blocking nerve impulses that are conveyed through the Frankenhäuser plexus. However, it may not be effective for pain in the upper part of the uterus, which has a different innervation. Intrauterine anaesthesia, by the infusion of a local anaesthetic into the uterine cavity, exerts a theoretical action by blocking nerve endings in the uterine corpus and fundus[4]

AIM OF THE STUDY

To study the effect of intrauterine lignocaine in addition to paracervical block compared to paracervical block as an analgesia during uterine curettage.

OBJECTIVES OF THE STUDY

1. To study the effect of intrauterine lignocaine and paracervical block with paracervical block alone for pain relief by VAS score (in woman undergoing uterine curettage).
2. To compare changes in non invasive blood pressure and pulse rate in both the groups.
3. To compare the complications and side effects between the 2 groups.
4. To assess the need for additional.

METHODOLOGY

This is a randomized control clinical study, which will be done over a period of 18 months on 100 women on OPD basis in the Department of Obstetrics and Gynaecology, Adichunchanagiri Institute of Medical Sciences, Adichunchagiri University, B G Nagara, Karnataka.

➢**Study Participants**

Inclusion Criteria:

- All women planned for endometrial curettage for diagnostic and/or therapeutic purposes during the study period and fit according to American Society of Anesthesiologists (ASA) class I and II

Exclusion Criteria:

- Previous surgery on cervix
- Active pelvic inflammatory disease
- Chronic pelvic pain
- Previous history of allergic reaction to either lignocaine or NSAIDS
- Those who have not given informed consent

Study Groups

This study consists of total of 100 patients who will be divided into two groups.

Group 1: Paracervical block will be given

Group 2: Paracervical block and intrauterine lignocaine instillation will be given

Study Procedure

All patients received Inj Atropine 1ml prior to the start of the procedure. With all the aseptic precautions, a sims speculum is used to expose the cervix. The cervical anterior lip was held in place using a vulsellum forceps. In group 1, patients received paracervical block of 10 ml of 2% lignocaine at 3 and 9 o'clock positions of the cervicovaginal junction followed by 5ml of normal saline instillation with the help of foley's catheter (no.8). In group 2, 2% lignocaine instillation was done into the uterus using foley's catheter (no.8).The catheter was kept insitu for 5 min to prevent backflow and to let anaesthesia kick in.After removing the foley's catheter cervix was serially dilated using hegar's dilator (upto no.8). The endometrium was curetted from all sides of the uterus until a grating sensation was felt.

The pulse rate and blood pressure of the women were measured before the procedure, during the procedure and again at 30 min post procedure. The visual analogue scale (VAS) was used to assess the severity of the patient's pain. The VAS score ranges from 0 (no pain) to 10 (the most severe pain). The outcome was then divided into three categories: mild (0–4), moderate (5–6), and severe (7–10) pain. Three different time points are used to assess the patients' pain: when the vulsellum is used to grip the cervix, during uterine curettage, and then 30 minutes post procedure. If the VAS score is >6 (i.e severe pain), additional analgesia was given either by intramuscular or intravenous route. The complications of the procedure such as cervical injury, uterine perforation and heamorrhage were compared in both the groups. The side effects of lignocaine such as- light headedness, dizziness, bradycardia, hypotension, cardiac arrythmias, rashes, angioedema, anaphylaxis were also compared.

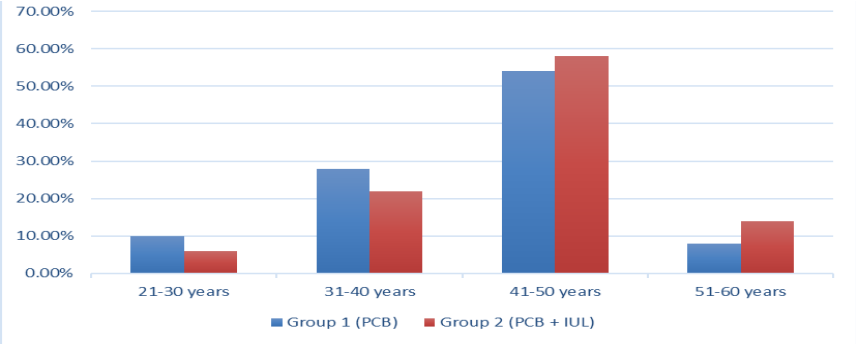
Data Analysis -Data will be analysed by Intention to treat (ITT) analysis. Initially all the baseline variables will be compared between the two groups, to assess any significant differences in these variables between the two study groups. Then the key primary and secondary outcome variables will be compared between the two groups, to document the efficacy and safety of the intervention.

RESULTS

Table 1: Age-wise distribution

Age group (years)	Group 1 (PCB)		Group 2 (PCB + IUL)	
	Number	Percentage	Number	Percentage
21-30	5	10.00%	3	6.00%
31-40	14	28.00%	11	22.00%
41-50	27	54.00%	29	58.00%
51-60	4	8.00%	7	14.00%
p-value	0.6259			

In Group 1, the majority of participants (54.00%) were aged 41–50 years, followed by 31–40 years (28.00%), 21–30 years (10.00%), and 51–60 years (8.00%). Similarly, in Group 2, the highest proportion of participants (58.00%) were in the 41–50 years age group, followed by 31–40 years (22.00%), 51–60 years (14.00%), and 21–30 years (6.00%). The p-value of 0.6259 indicates no statistically significant difference in age distribution between the two groups.

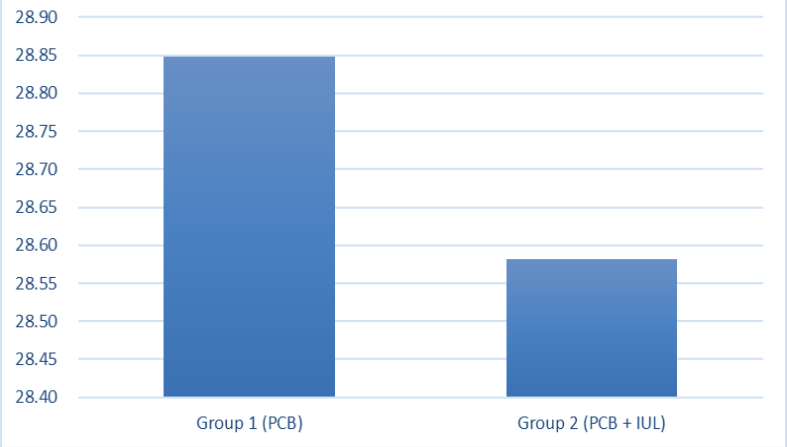


Graph 1: Age-wise distribution

Table 2: Comparison of mean BMI in both groups

BMI	Group 1 (PCB)	Group 2 (PCB + IUL)
Mean	28.85	28.58
SD	5.58	8.35
p-value	0.8520	

The mean Body Mass Index (BMI) for Group 1 was 28.85 ± 5.58, while for Group 2 it was 28.58 ± 8.35. The p-value of 0.8520 suggests no statistically significant difference in BMI between the two groups.

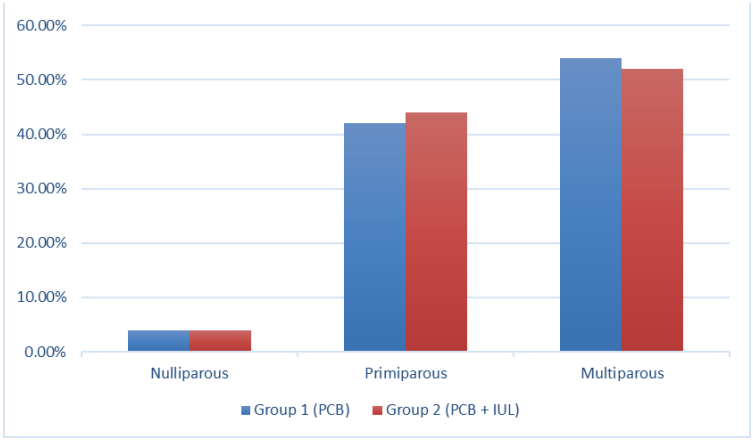


Graph 2: Mean BMI in both groups

Table 3: Comparison of Parity in Both Groups

Parity	Group 1 (PCB)		Group 2 (PCB + IUL)	
	Number	Percentage	Number	Percentage
Nulliparous	2	4.00%	2	4.00%
Primiparous	21	42.00%	22	44.00%
Multiparous	27	54.00%	26	52.00%
p-value	0.9791			

In Group 1, 54.00% of participants were multiparous, 42.00% were primiparous, and 4.00% were nulliparous. Likewise, in Group 2, 52.00% were multiparous, 44.00% were primiparous, and 4.00% were nulliparous. The p-value of 0.9791 suggests no statistically significant difference in parity between the two groups.

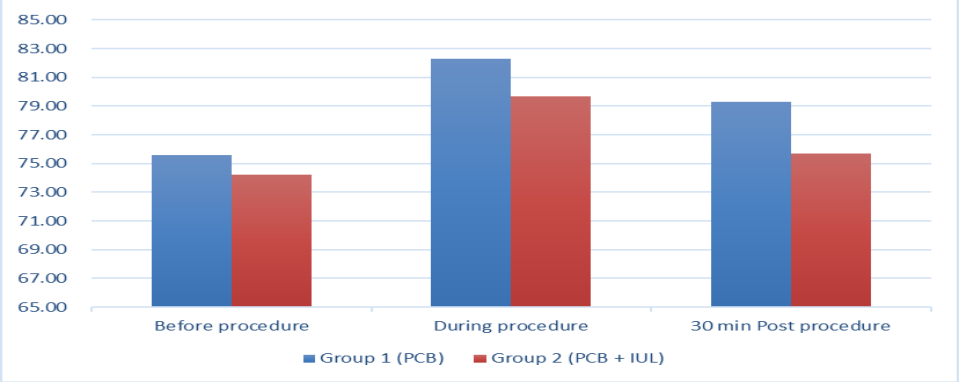


Graph 3: Parity in both groups

Table 4: Comparison of Pulse Rate at different time points

Pulse Rate	Group 1 (PCB)		Group 2 (PCB + IUL)		p-value
	Mean	SD	Mean	SD	
Before procedure	75.60	5.45	74.24	4.90	0.1925
During procedure	82.28	4.44	79.70	5.07	0.0080
30 min post procedure	79.28	4.44	75.70	5.07	0.0003

Before the procedure, the mean pulse rate was comparable between Group 1 (75.60 ± 5.45) and Group 2 (74.24 ± 4.90), with a p-value of 0.1925, indicating no significant difference. During the procedure, the pulse rate was significantly higher in Group 1 (82.28 ± 4.44) compared to Group 2 (79.70 ± 5.07) (p = 0.0080). Similarly, 30 minutes post-procedure, the pulse rate remained significantly higher in Group 1 (79.28 ± 4.44) than in Group 2 (75.70 ± 5.07) (p = 0.0003).

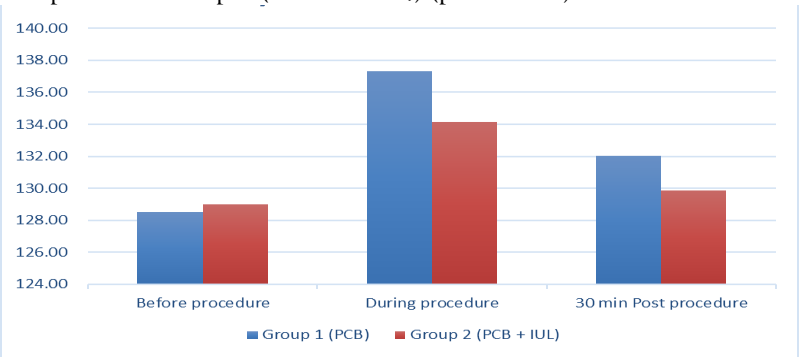


Graph 4: Bar chart showing pulse rate at different time points

Table 5: Comparison of Systolic Blood Pressure at different time points

Systolic Blood Pressure	Group 1 (PCB)		Group 2 (PCB + IUL)		p-value
	Mean	SD	Mean	SD	
Before procedure	128.52	6.67	128.98	6.17	0.7211
During procedure	137.34	4.37	134.14	3.50	0.0001
30 min post procedure	132.02	3.58	129.88	5.04	0.0161

Before the procedure, the mean SBP was similar between Group 1 (128.52±6.67) and Group 2 (128.98±6.17), with a p-value of 0.7211, indicating no significant difference. During the procedure, SBP was significantly higher in Group 1 (137.34±4.37) compared to Group 2 (134.14±3.50) (p = 0.0001). Similarly,30 minutes post-procedure, SBP remained significantly elevated in Group 1 (132.02±3.58) compared to Group 2 (129.88±5.04) (p = 0.0161).

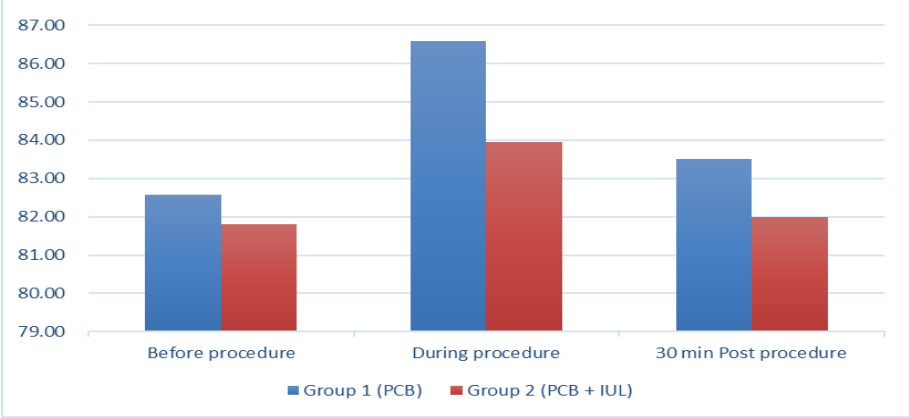


Graph 5: Systolic Blood Pressure at different time points

Table 6: Comparison of Diastolic Blood Pressure at different time points

Diastolic Blood Pressure	Group 1 (PCB)		Group 2 (PCB + IUL)		p-value
	Mean	SD	Mean	SD	
Before procedure	82.58	5.36	81.80	4.51	0.4333
During procedure	86.58	3.42	83.96	3.55	0.0003
30 min post procedure	83.50	3.52	82.00	3.41	0.0328

Before the procedure, the mean DBP was comparable between Group 1 (82.58±5.36) and Group 2 (81.80±4.51), with a p-value of 0.4333, indicating no significant difference. During the procedure, DBP was significantly higher in Group 1 (86.58±3.42) compared to Group 2 (83.96±3.55) (p = 0.0003). Similarly, 30 minutes post-procedure, DBP remained significantly higher in Group 1 (83.50±3.52) than in Group 2 (82.00±3.41) (p = 0.0328).

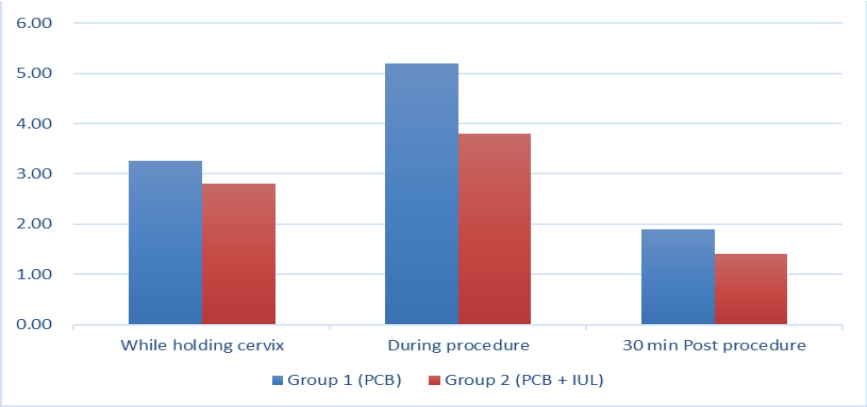


Graph 6: Bar chart showing Diastolic Blood Pressure at different time points

Table 7: Comparison of VAS Score at different time points

VAS score	Group 1 (PCB)		Group 2 (PCB + IUL)		p-value
	Mean	SD	Mean	SD	
While holding cervix	3.26	1.01	2.80	0.76	0.0112
During procedure	5.20	1.07	3.80	0.76	<0.0001
30 min post procedure	1.90	0.89	1.40	0.49	0.0007

The mean VAS score while holding the cervix was significantly higher in Group 1 (3.26±1.01) compared to Group 2 (2.80±0.76) (p = 0.0112). During the procedure, pain scores were significantly higher in Group 1 (5.20±1.07) compared to Group 2 (3.80±0.76), with a p-value of <0.0001. Similarly, 30 minutes post-procedure, VAS scores remained significantly higher in Group 1 (1.90±0.89) compared to Group 2 (1.40±0.49) (p = 0.0007), suggesting that patients in Group 2 experienced lower pain levels throughout the procedure and recovery.



Graph 7: VAS Score at different time points

Table 8: Comparison of Complications in both groups

Complications	Group 1 (PCB)		Group 2 (PCB + IUL)		p-value
	Number	Percentage	Number	Percentage	
Cervical injury	2	4.00%	1	2.00%	0.5611
Uterine Perforation	0	0.00%	0	0.00%	-
Hemorrhage	0	0.00%	0	0.00%	-

The incidence of complications was low in both groups. Cervical injury occurred in 4.00% of patients in Group 1 and 2.00% in Group 2, with a p-value of 0.5611, indicating no significant difference. No cases of uterine perforation or hemorrhage were reported in either group.

Table 9: Comparison of Adverse Effects in Both Groups

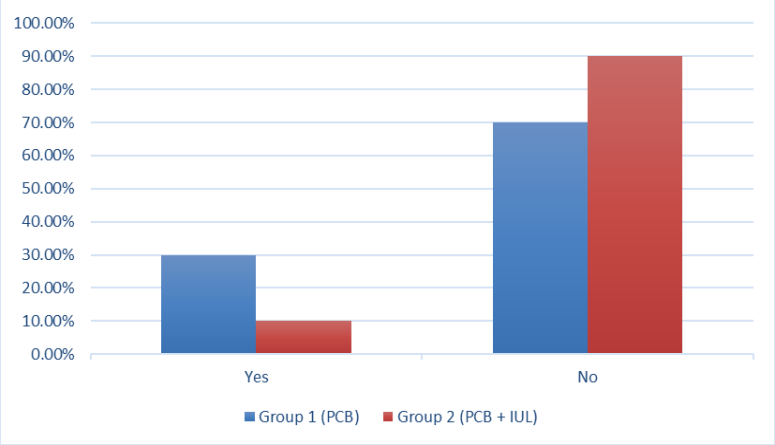
Adverse effects	Group 1 (PCB)		Group 2 (PCB + IUL)		p-value
	Number	Percentage	Number	Percentage	
Light-headedness	5	10.00%	3	6.00%	0.4609
Dizziness	4	8.00%	2	4.00%	0.3997
Bradycardia	2	4.00%	0	0.00%	0.1531
Hypotension	1	2.00%	0	0.00%	0.3148
Cardiac Arrhythmias	0	0.00%	0	0.00%	-

The incidence of adverse effects was generally low in both groups. Light-headedness was reported in 10.00% of patients in Group 1 and 6.00% in Group 2 ($p = 0.4609$). Dizziness occurred in 8.00% of patients in Group 1 and 4.00% in Group 2 ($p = 0.3997$). Bradycardia and hypotension were observed in 4.00% and 2.00% of patients, respectively, in Group 1, whereas no cases were reported in Group 2 ($p = 0.1531$ and $p = 0.3148$, respectively). No cardiac arrhythmias were noted in either group.

Table 10: Comparison of additional analgesia requirement in both groups

Additional Analgesia	Group 1 (PCB)		Group 2 (PCB + IUL)	
	Number	Percentage	Number	Percentage
Yes	15	30.00%	5	10.00%
No	35	70.00%	45	90.00%
p-value	0.0124			

The need for additional analgesia was significantly higher in Group 1 compared to Group 2. In Group 1, 30.00% of patients required additional analgesia, whereas only 10.00% in Group 2 needed it ($p = 0.0124$). This suggests that the PCB + IUL approach provided better pain control, reducing the need for supplemental analgesia.



Graph 10: Additional analgesia requirement in both groups

DISCUSSION

Pain management during dilatation and curettage (D&C) is a key clinical challenge. This randomized study compared the efficacy of paracervical block (PCB) alone with PCB combined with intrauterine lignocaine (IUL). One hundred patients were randomized into two groups: PCB alone (Group 1, n=50) and PCB + IUL (Group 2, n=50). Pain was assessed using the Visual Analog Scale (VAS) at cervix holding, intraoperatively, and 30 minutes post-procedure. Hemodynamic stability, need for supplemental analgesia, complications, and adverse effects were also evaluated.

Baseline demographic characteristics including age, BMI, and parity were comparable between groups ($p>0.05$), confirming successful randomization. Hemodynamic parameters were similar at baseline, but

during and after the procedure Group 2 had significantly lower pulse rates, systolic, and diastolic blood pressures compared to Group 1 ($p<0.05$), reflecting better hemodynamic stability.

VAS scores were significantly lower in Group 2 across all stages: cervix holding (2.80±0.76 vs. 3.26±1.01; $p=0.0112$), intraoperative (3.80±0.76 vs. 5.20±1.07; $p<0.0001$), and postoperative (1.40±0.49 vs. 1.90±0.89; $p=0.0007$). The requirement for rescue analgesia was reduced in Group 2 (10%) compared to Group 1 (30%) ($p=0.0124$). Complications were rare in both groups, limited to minor cervical injuries (4% in Group 1 vs. 2% in Group 2), with no uterine perforations or hemorrhage. Adverse effects such as dizziness, hypotension, and bradycardia occurred sporadically, with no significant intergroup differences. Importantly, no cardiac arrhythmias or hospitalizations were reported.

Our findings are in agreement with earlier studies. Arora et al. (2015)[1] demonstrated that pain scores were significantly lower at all stages when IUL was combined with PCB compared to PCB alone. Ayegbusi et al. (2021)[5] similarly reported lower intraoperative and postoperative VAS scores and reduced need for additional analgesia with IUL plus PCB. Effat et al. (2024)[6] found significantly reduced pain scores when IUL was added to PCB compared with either method alone. Sabri et al. (2023)[7] also confirmed that combined intrauterine lignocaine and PCB provided greater analgesia than single techniques. These consistent results strengthen the evidence that intrauterine lignocaine enhances the analgesic effect of PCB. The superior analgesia of the combined approach can be explained by its broader neural blockade. While PCB interrupts parasympathetic fibers from S2–S4, pain transmission also involves sympathetic innervation from T10–L1, which is more effectively targeted by intrauterine lignocaine. This synergistic effect likely accounts for the improved pain relief and hemodynamic stability observed.

In conclusion, the addition of intrauterine lignocaine to paracervical block during D&C significantly reduces pain, improves hemodynamic stability, and decreases the need for supplemental analgesia without increasing adverse effects. This combined approach is safe, effective, and cost-efficient, making it a valuable option for routine gynecological practice.

Strength Of The Study

- **Randomized Controlled Design**: The use of a randomized controlled trial design enhances the reliability and validity of the results, minimizing selection bias.
- **Comprehensive Measurement**: The study measured multiple outcomes, including physiological responses (pulse rate, blood pressure), pain levels (VAS), complications, and adverse effects, providing a well-rounded assessment of the intervention.
- **Clinical Relevance**: The focus on pain management and the practical application of the findings in a clinical setting enhances the study's relevance and potential impact on patient care.

Limitations

- **Small Sample Size:** The relatively small sample size may limit generalizability of the results. A larger study population would provide more robust data and strengthen the conclusions.
- **Short-Term Follow-Up:** The study only measured outcomes immediately before, during, and after the procedure. A longer follow-up period would provide a better understanding of the long-term effects and potential complications associated with PCB + IUL.
- **Single-Center Study:** The study was conducted at a single center, which may limit the generalizability of the findings to other settings or populations.

CONCLUSION

The study offers promising insights into the benefits of adding Intra Uterine Lignocaine to Paracervical block, particularly in terms of pain management and patient comfort. Also, adding 2% intrauterine lignocaine to the paracervical block does not enhance the adverse effects, it is a safe and cost effective method. However, future research with larger sample sizes, longer follow-up periods, and more diverse populations is necessary to confirm and extend these.

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