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Between NSAIDs, Local Anesthetics, and Non-medicinal Analgesics, Which Method is the Most Effective at Providing Pain Relief During IUD Insertions for Nulliparous and Multiparous Women?

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Between NSAIDs, local anesthetics, and non-medicinal analgesics, which method in comparison to a placebo is the most effective at providing pain relief during IUD insertions for nulliparous and multiparous women?

Natali Sharma |OMS-II

Background:

- According to the CDC, over 10% of women aged 15-49 currently use long-acting reversible contraception, including IUDs and contraceptive implants.
- Unfortunately, despite the safety and high efficacy of IUDs, one major barrier for this intervention includes a widespread sense of fear regarding pain during insertion of the device.
- By researching the most effective IUD insertion analgesics available and standardizing these pain management methods in the future, women may be less fearful of obtaining IUDs and in return receive a better healthcare experience during the process of IUD insertion.

Significance

- Currently, there is no standard practice for administering analgesics patients undergoing this procedure, as pain is subjective and highly variable. By evaluating and contrasting the effectiveness of certain analgesic methods during IUD insertions, one may be able to use these results to potentially standardize a method of pain management for patients.

Limitations:

- Not all the studies reviewed incorporate nulliparous and multiparous simultaneously; some studies assert the tendency of multiparous patients to be more likely to obtain IUDs, so the nulliparous female population may be excluded from some of these trials
- Some of the studies reviewed only evaluated the physical pain that may be experienced during the IUD insertion such as when the speculum is placed, or the tenaculum is inserted, rather than the discomfort that may be associated with the anticipation of pain and prior anxiety
- Long term pain that may have persisted post IUD insertion was not considered into the pain reported by patients
- This literature review did not control for the type of IUD used within each study, the size differences of copper IUDs versus the varying hormonal IUDs used may have also influenced the pain experienced by patients

Methods:

- The outcomes of systemic reviews, double blind randomized trials and other primary studies that have evaluated the efficacy of local anesthetic use such as Lidocaine, compared to NSAIDs, or non-pharmaceutical treatments during IUD insertions to mitigate patient discomfort were analyzed.
- Literature reviews, primary studies and trials, systematic reviews conducted within the last 15 years were considered.
- The specific outcomes measured include the pain management method used, the dosage administered, the pain experienced by patients evaluated using a Visual Analog Scale (VAS) prior to insertion of the tenaculum and post insertion of the IUD

Methods:

Data Base Searched	Date of Search	Key Word String	Number of Results
PubMed	9/2/2023	iud insertion analgesic methods	68
Scopus	9/4/2023	analgesic AND methods AND in AND iud AND insertion	46
Web of Science	9/4/2023	iud insertion analgesic methods	10
EMBASE	9/6/2023	iud insertion analgesic methods	182
Cochrane Library	9/6/2023	iud insertion analgesic methods	44

Results:

Lidocaine Based Interventions:

Study Description	Intervention	Pain Reduction Effectiveness (VAS Score)	Conclusion
10% Lidocaine Spray vs. Saline Placebo (200 participants)[1]	10% Lidocaine Spray	Treatment: 1.01 ± 1.20 vs. Control: 3.23 ± 1.60	Significant pain reduction with lidocaine spray
1% Lidocaine Paracervical Block vs. Placebo (50 participants)[11]	1% Lidocaine Paracervical Block	No statistically significant difference in perceived pain (p=0.09)	No notable pain reduction observed
2% Lidocaine via Endometrial Aspirator (40 participants)[12]	2% Lidocaine	Treatment: 2.95 vs. Placebo: 3.75 (p=0.37)	No significant difference in pain scores
Meta-analysis of Analgesic Methods (13 studies)[14]	Various analgesic methods	Paracervical lidocaine effective in pain reduction; misoprostol associated with higher pain scores	Lidocaine effective via paracervical administration
Various Forms of Lidocaine (200 participants)[10]	2g of lidocaine cream vs 50ml lidocaine spray vs 1ml lidocaine injections)	Lowest VAS pain scores in lidocaine spray group (P=0.001)	Lidocaine spray most effective
2% Lidocaine Cervical Gel vs. Placebo (145 participants)[2]	2% Lidocaine Cervical Gel	Treatment: 35.2 vs. Placebo: 36.7 (P=0.8)	No significant pain reduction observed
Oral Ketorolac 20mg vs. Placebo (72 participants)[5]	Oral Ketorolac (20mg)	Ketorolac group: 3.6 vs. Placebo: 4.9 (P=0.0047)	Ketorolac showed significant pain reduction
Meta-analysis of Pharmacological Interventions (38 trials)[14]	Various pharmacological interventions	Lidocaine-prilocaine cream most effective, followed by paracervical lidocaine, naproxen, and ibuprofen	Lidocaine-prilocaine cream highly effective

NSAID Based Interventions:

Study Description	Intervention	Pain Reduction Effectiveness (VAS Score)	Conclusion
800mg Ibuprofen vs. Placebo (200 participants)[4]	800mg Ibuprofen	Ibuprofen: 38.0mm vs. Placebo: 41.5mm (P=0.50)	Ibuprofen ineffective in reducing pain
Tramadol vs. Naproxen vs. Placebo (103 participants)[9]	50mg Tramadol	Tramadol lower VAS pain scores than naproxen and placebo (P=0.001)	Tramadol effective in reducing pain
NSAIDs (50mg Diclofenac + 2% Lidocaine) (90 parous participants)[6]	50mg Diclofenac + 2% Lidocaine Gel	Statistically lower VAS score (P=0.003) but no clinical significance	Limited pain reduction observed

Non-pharmaceutical Based Interventions:

Study Description	Intervention	Pain/Anxiety Reduction Effectiveness (VAS Score)	Conclusion
Oral Tramadol vs. Verbal Analgesics (54 women)[5]	50mg Oral Tramadol	Tramadol: 4.5 ± 1.6 vs. Analgesics: 4.8 ± 2.4 (P=0.610)	No significant difference in pain between groups
Inhaled Lavender vs. Control (106 women)[16]	Inhaled Lavender	No significant difference in pain (P=0.51), lower anxiety in experimental group (P<0.001)	Lavender reduced anxiety but not pain
Cold Compress vs. Control (142 women)[8]	Cold Compress	No significant difference in pain (P=0.805)	Cold compress ineffective for pain reduction
Transabdominal Ultrasound Guidance vs. Traditional Insertion (RCTs)[3]	Ultrasound Guided IUD Insertion	Statistically significant reduction in pain scores (P<0.001)	Ultrasound guidance reduces pain during insertion
PubMed Literature Review on Analgesic Methods for IUD Insertion[7]	Various analgesic methods	Lack of conclusive evidence for pharmacological intervention, NSAIDs more effective post-procedure	Importance of calming environment for anxiety reduction

Discussion:

- Results relating to lidocaine paracervical blocks, cream, gel, and injection showed inconsistent efficacies, whereas the use of lidocaine spray yielded significant pain reduction compared to a saline placebo. Particularly, the use of lidocaine-prilocaine cream was evaluated to be the most substantial in lowering IUD insertion pain, followed by paracervical lidocaine, as evaluated by a holistic meta-analysis assessing 38 randomized controlled trials.
- Comparatively, the effectiveness of NSAIDs, including naproxen, diclofenac potassium and ibuprofen, demonstrated diverse outcomes in this review. While ibuprofen failed to accomplish a statistically significant reduction of pain during IUD insertion, tramadol demonstrated a substantial analgesic effect compared to naproxen and placebo group.
- The inhaled lavender use as aromatherapy was effective in reducing anxiety levels during IUD insertion, but this method failed to substantially reduce pain scores. Similarly, verbal analgesics and the use of a cold compress did not produce a notable reduction in pain scores. In contrast, the use of transabdominal ultrasound guidance during IUD insertion demonstrated a significant decrease in VAS pain perception compared to the traditional insertion method.
- These conclusions emphasize the potential of lidocaine-prilocaine cream and specific NSAIDs for pain management, while also stressing the need for further research to optimize administration methods, dosages, and combinations for improved pain reduction during this gynecological procedure. Furthermore, this literature review features the importance of a soothing clinical environment as a complementary technique to ease the anxiety which many patients experience while undergoing IUD insertion.

Future Direction

- Pain management for patients during gynecological procedures including IUD insertions is highly subjective, and should be individually evaluated for each patient
- Methods that have shown higher analgesic effectiveness in this literature review have been characterized into lidocaine, NSAID or non-pharmacological based treatments
- In the future, more diverse populations of women may be incorporated during further studies as well as different types of IUDs. Pain experienced soon after IUD insertion may also be taken into consideration for further trials.
- Using these results, we may better be equipped to provide a standard basis of pain management for patients to not only treat pain, but alleviate anxiety associated with the procedure. With better pain control, IUD use may become more widespread, in efforts to decrease unintended pregnancies using this extremely effective, safe, long term and reversible method of contraception.

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