Non-Inferiority Analysis of Levonorgestrel IUD versus Oral Levonorgestrel for Emergency Contraception: A Systematic Review and Meta-Analysis

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Keywords

emergency contraception; oral levonorgestrel; Plan B; intrauterine device; pregnancy prevention; levonorgestrel

Abstract

Introduction: Emergency contraception (EC) is a critical component of reproductive health care, with currently approved oral options including levonorgestrel (LNG) and ulipristal acetate. Although effective, oral EC methods demonstrate reduced efficacy with increasing time since intercourse and higher body-mass index (BMI). In contrast, intrauterine devices (IUDs), particularly the copper IUD, provide highly effective EC. Emerging evidence suggests that the levonorgestrel IUD may also be a noninferior option. This systematic review and meta-analysis examined the comparative efficacy of the LNG-IUD versus oral LNG for EC.

Methods: Following PRISMA guidelines, PubMed, Scopus, Medline, and ClinicalTrials.gov were searched through December 2024. Five studies involving 920 participants met inclusion criteria and were evaluated for risk of bias with the Mixed Methods Appraisal Tool (MMAT). Using a random-effects meta-analysis, we estimated pooled pregnancy proportions with 95% confidence intervals, assessed heterogeneity and publication bias, and conducted a noninferiority test with a 1% margin to compare the effectiveness of the levonorgestrel IUD versus oral levonorgestrel for EC.

Results: This study found an overall pregnancy proportion of 1% or less, with no significant differences among LNG-IUD, oral LNG, and copper IUD groups. Noninferiority testing demonstrated that the LNG-IUD was noninferior to oral LNG, as the upper bound of the pooled difference (0.008) remained below the 1% margin.

Conclusion: Despite limited direct comparison studies requiring subgroup formation, these findings indicate that the LNG-IUD does not confer a clinically meaningful increase in pregnancy risk as compared with oral LNG when used for EC. The findings suggest that the LNG-IUD could be a promising alternative to oral LNG for EC, offering both immediate and long-term contraception. Further large-scale, direct comparative studies are warranted to expand EC options for women.

Introduction

Emergency contraception (EC) is a critical yet often underrecognized component of women's reproductive health care, serving as an essential safeguard against unintended pregnancy after unprotected or inadequately protected intercourse.[1] The United States Food and Drug Administration (FDA) currently approves two oral EC methods: a progestin-only formulation containing levonorgestrel (LNG), administered either as a single 1.5-mg dose or as two 0.75-mg doses 12 hours apart, and the selective progesterone-receptor modulator ulipristal acetate (UPA), administered at a 30-mg dose.[2] Although both methods are widely used, it is important to note that neither method is 100% effective.[3,4]

Oral LNG EC is most effective when taken as soon as possible, ideally within 72 hours after intercourse.[5] However, its efficacy declines over time, particularly in individuals with a higher body-mass index (BMI).[6] In contrast, UPA maintains effectiveness for up to 120 hours and demonstrates superior performance in women with elevated BMI, making it the more reliable oral EC option in these circumstances.[3]

Intrauterine devices (IUDs) can also serve as EC. Although no IUD currently holds FDA approval for this indication, the copper T380A IUD is widely regarded as the most effective nonoral EC option when inserted within 5 days after intercourse, with pregnancy rates of 0.2% or less.[7,8] Observational studies further demonstrate that individuals who used the copper IUD for EC had significantly lower pregnancy rates at 1 year than those who used oral LNG for EC.[9] Despite this strong evidence and support by the American College of Obstetricians and Gynecologists (ACOG), the copper IUD has not yet become the clinical standard for EC.[1,10–14]

The LNG-IUD, a well-established method of long-standing contraception, has recently gained attention as a potential option for EC.[15] Available in formulations ranging from 13.5 mg to 52 mg, it provides 3 to 8 years of highly effective pregnancy prevention, with efficacy rates of 99.2 to 99.6%.[16,17] In terms of EC, a recent randomized noninferiority trial published in the New England Journal of Medicine reported a 1-month pregnancy rate of 0.3% with the LNG-IUD as compared with 0% with the copper IUD when inserted within 5 days after intercourse, demonstrating noninferiority of the LNG device.[18] Notably, the effectiveness of the LNG-IUD did not vary according to BMI, which may offer an advantage over oral EC methods.[18] Additional data from a 2023 Cochrane review similarly suggested that progestin-containing IUDs may be an effective EC method, though more long-term safety and implementation data are needed because limited data are available.[19] Unlike oral levonorgestrel, which acts primarily through systemic absorption to delay or inhibit ovulation in a time-dependent manner, the LNG-IUD delivers continuous intrauterine hormone exposure that induces profound local endometrial suppression, alters cervical mucus, and impairs implantation-related processes, providing a biologically distinct mechanism for emergency contraception.

Despite this evidence, the LNG-IUD remains off-label for EC. It offers several advantages over oral forms, including immediate long-term contraceptive benefit, reduction in menstrual symptoms, and more consistent efficacy across BMI categories.[18] This review aims to gather the current evidence for comparative effectiveness of the LNG-IUD and the LNG pill as EC, hypothesizing that the LNG-IUD is noninferior to oral LNG in pregnancy prevention.

Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The research question was formulated

according to Population, Intervention, Comparison, Outcome, and Timeframe (PICOT) criteria.[20]

Table 1. Population, intervention, comparison, outcome, and timeframe criteria for inclusion of studies in this systematic review.

Parameter	Inclusion criteria
Population	Women of reproductive age
Intervention	LNG-IUD as emergency contraception; case-control studies, case studies, or randomized, controlled trials
Comparison	Oral LNG as emergency contraception; case-control studies, case studies, or randomized, controlled trials
Outcomes	Effectiveness of emergency contraception (pregnancy outcomes)
Timeframe	Published before December 16, 2024

LNG denotes levonorgestrel, and IUD intrauterine device.

Sources

A literature search was conducted up to December 16, 2024, with PubMed, Scopus, Medline (Ovid), and ClinicalTrials.gov to identify peer-reviewed English-language articles on the effectiveness of oral LNG and the LNG-IUD as EC. Keywords and MeSH terms (Appendix 1) guided the search. Rayyan[21] and Zotero were used for screening and organization. The accuracy of the search was verified by confirming inclusion of three known relevant articles.

Study Selection

Articles that met all PICOT criteria (Table 1) were included if they involved human patients of reproductive age using oral LNG or the LNG-IUD as EC and if they were randomized, controlled trials, case studies, or case-control studies. The wide range of article types was included because of the limited number of studies reported on this topic. Exclusion criteria included incorrect predictor variables, altered timing of drug administration based on ovulation, irrelevant outcomes, lack of original data, inappropriate population, non-English language, or unsuitable study design.

After duplicates were removed in Zotero by A. Blankenstein, article abstracts were screened in Rayyan by A. Blankenstein, C. Crow, J. Currier, E. Hock, B. Liyanage, and E. Williams, with each article reviewed by at least two screeners. All screeners were given inclusion and exclusion criteria. Discrepancies were resolved by group discussion. Full-text screening and data extraction were then completed by the same team.

Assessment of Risk of Bias

To evaluate the risk of bias in each study included in the full-text reviews, two authors independently assessed one article with the Mixed Methods Appraisal Tool (MMAT), version 2018.[22] This tool is specifically designed to assess the risk of bias in studies with different designs included in a single systematic review. The MMAT table for each article is displayed in Table 2. In addition, specific questions addressed for MMAT assessment are included in Appendix 2.

Table 2. MMAT assessment for risk of bias.

Study type	Authors (Year)	S1	S2	2.1	2.2	2.3	2.4	2.5
Quantitative Randomized Controlled Trials		**S1**	**S2**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**
Phase II/III Studies	Turok D.K., et al. (2021) [18]	Y	Y	Y	Y	Y	N	Y
Open Label Studies	Planned Parenthood (2024) [23]	Y	Y	Y	Y	N	N	Y
Quantitative Non-Randomized		**S1**	**S2**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**
Observational Studies	Turok D.K., et al. (2010) [14]	Y	Y	N	Y	Y	Y	Y
Observational Studies	Elnasar I., et al. (2021) [24]	Y	Y	N	Y	Y	Y	Y
Observational Studies	Turok D.K., et al. (2013) [9]	Y	Y	Y	Y	Y	Y	N

Risk-of-bias assessment for studies evaluating LNG-IUD versus oral LNG for emergency contraception, including studies conducted across multiple international settings and published through December 2024. A "Y" indicates "Yes" for a given MMAT criterion, and an "N" indicates "No." Overall, the included studies demonstrated low risk of bias, with most meeting key indicators of strong methodological quality.

Risk-of-bias assessment for studies evaluating LNG-IUD versus oral LNG for emergency contraception, including studies conducted across multiple international settings and published through December 2024. A "Y" indicates "Yes" for a given MMAT criterion, and an "N" indicates "No." Overall, the included studies demonstrated low risk of bias, with most meeting key indicators of strong methodological quality.

Meta-Analysis

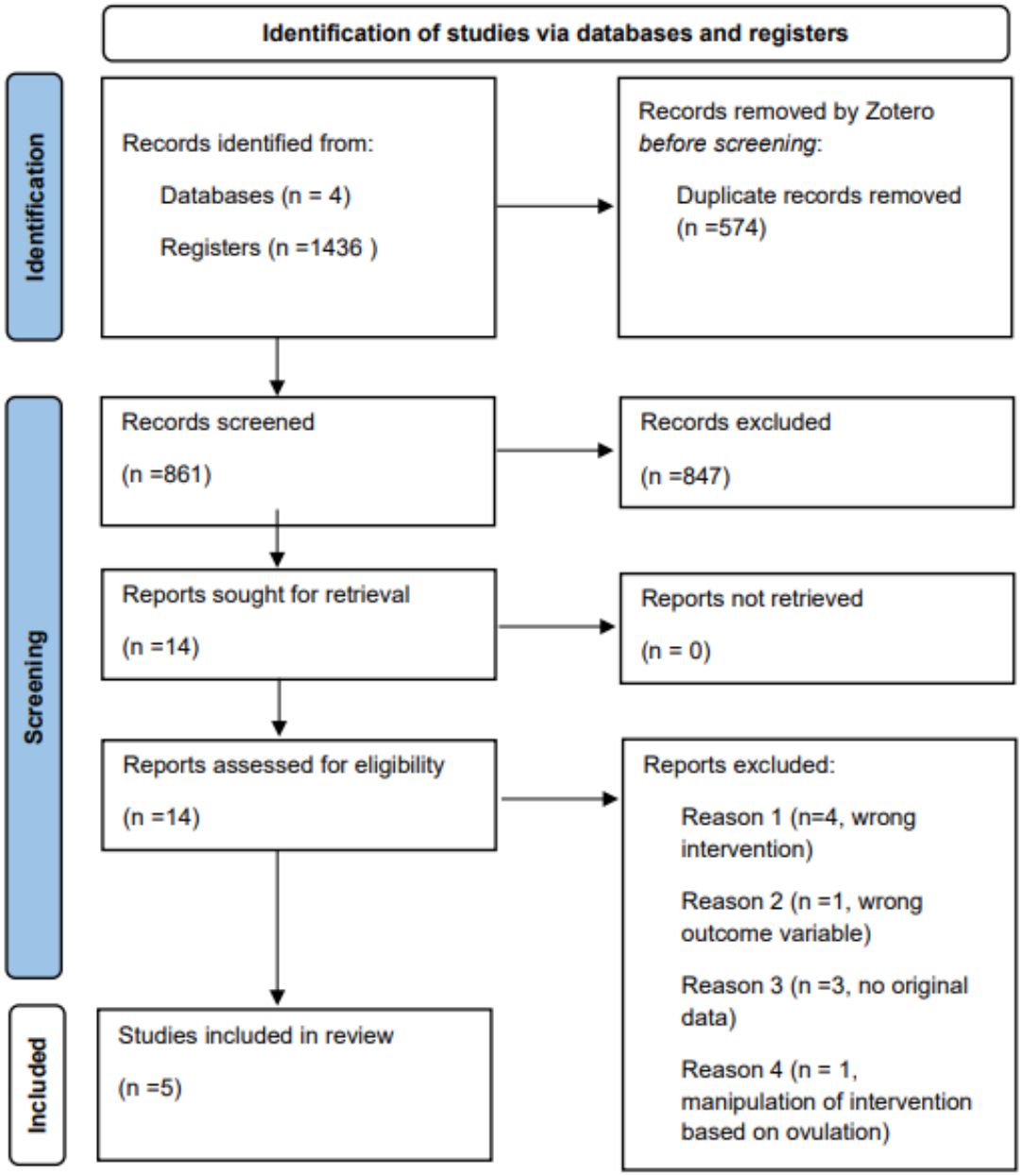
Statistical analyses were conducted with the metafor package in R software, version 4.5.1. Meta-analysis used random-effects models for the pregnancy proportion, because heterogeneity was significant in the fixed-effects models (Q test, 25.4725; P=0.0013). Weighted estimates of proportion with 95% confidence intervals were reported in the forest plot to evaluate the efficacy of the levonorgestrel intrauterine device and oral levonorgestrel for contraception. I^2 estimated the percentage of total variability in the observed effect sizes that could be attributed to heterogeneity and estimated the amount of heterogeneity. Funnel plots, tests for funnel-plot asymmetry, and limit estimates were used to identify bias. A noninferiority test based on a margin of 1% was conducted. All analytical results were considered significant when P values were 0.05 or less.

Results

Study Selection

A total of 1433 articles were retrieved from PubMed, Scopus, Medline (Ovid), and ClinicalTrials.gov. After 574 duplicates were removed, 859 articles remained and were screened with PICOT criteria. Fourteen articles underwent full-text review; four were excluded for wrong intervention, one for reporting the wrong outcome variable, three for lacking original data, and one for manipulation of intervention timing based on ovulation. Ultimately, five studies met inclusion criteria and were incorporated into the meta-analysis. A detailed overview of the study-selection process is illustrated in the PRISMA flow diagram (Figure 1). Appendix 3 includes demographic characteristics of individual studies.

Figure 1. PRISMA 2020 flow diagram outlining study selection for the systematic review and meta-analysis of LNG-IUD versus oral LNG for emergency contraception, including studies published through December 2024.



Study Characteristics

A total of 5 studies involving 920 participants were included in the meta-analysis to indirectly compare pregnancy rates between the LNG-IUD and LNG pill as EC. Three prospective observational studies that compared oral LNG with the copper IUD were included. The other two studies were randomized,

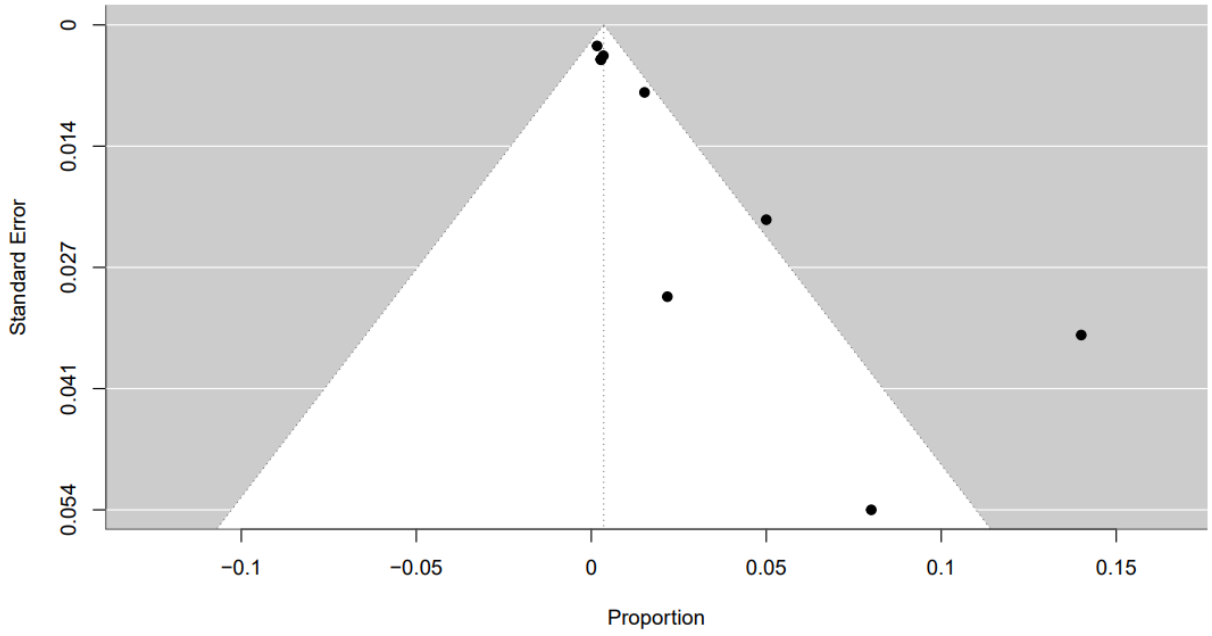
controlled trials, one of which examined the LNG-IUD alone and one of which compared it with the copper IUD as EC.

From our subgroups of the LNG-IUD and oral LNG as EC, 461 participants received oral LNG and 459 received the LNG-IUD. All participants were female, with a mean age of 24.8 years. Two studies did not report race; among those that did, most participants identified as White (n=318, 34.6%), followed by Hispanic (n=119, 12.9%), African American (n=118, 12.8%), and Asian (n=3, <1%).

Risk-of-Bias Assessment

To evaluate the quality of the included studies, a risk-of-bias assessment was conducted. Each of the 5 studies had relatively low bias. A table using the MMAT criteria can be seen in Table 2. Weaknesses were evident in the target-population category, because participants in most studies were limited to a particular location or by other reproductive characteristics, such as multiparity. In addition, the randomized, controlled trials were not blinded, lowering their risk-of-bias scores. A funnel plot and funnel-plot asymmetry test were also conducted to further assess bias (Figure 2). The funnel plot for transformed proportion showed apparent asymmetry, which was supported by the test for funnel-plot asymmetry (P=0.0001). This may be an indication of publication bias. However, there may be reasons other than publication bias that could lead to asymmetry in the funnel plot. A nonsignificant coefficient (0.0025; 95% CI, −0.0007 to 0.0057) implied no pattern of publication bias. We minimized publication bias by following PRISMA guidelines to explore databases systematically. However, we were unable to adequately explain the other type of bias causing the funnel-plot asymmetry for the proportion of pregnancy.

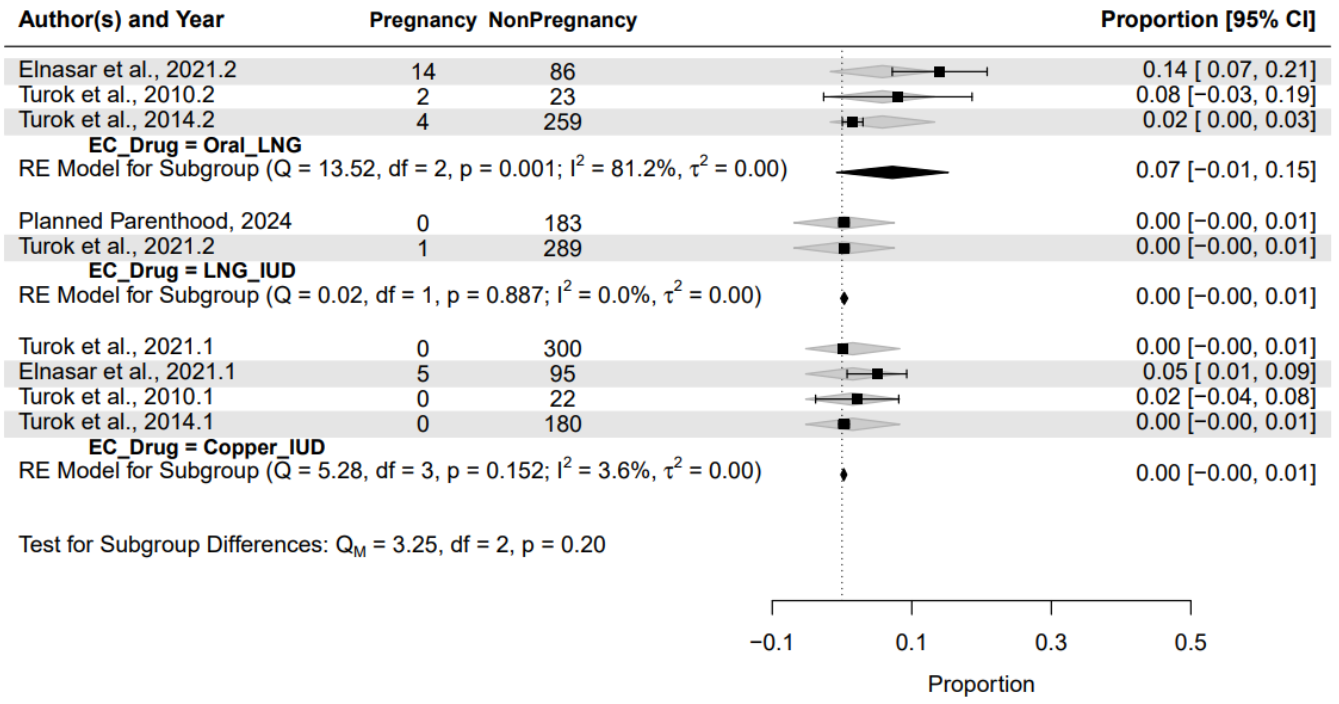
Figure 2. Funnel plot of transformed pregnancy proportions from all study arms included in the systematic review and meta-analysis of LNG-IUD versus oral LNG for emergency contraception, incorporating studies published through December 2024. The plot is used to assess potential publication bias. Visual inspection suggests asymmetry, supported by a significant test for funnel-plot asymmetry (P=0.0001).



Forest Plot

A random-effects model estimated the proportion of pregnancy at 1% or lower (95% CI, <0.01 to 0.01) (Figure 3). The subgroup for the LNG-IUD's proportion of pregnancy was 0.00 (95% CI, −0.00 to 0.01), indicating that the probability of pregnancy in this group was less than 1%. The oral LNG subgroup proportion of pregnancy was 0.07 (95% CI, −0.01 to 0.15), indicating that the probability of pregnancy in this group was less than 15%. Last, the copper IUD subgroup had a probability of 0.00 (95% CI, −0.00 to 0.01), also indicating that the probability of pregnancy was less than 1% in this group. The results showed no significant difference among the three subgroups for pregnancy rate (P=0.20).

Figure 3. Forest plot summarizing pregnancy event proportions from six study arms across three predefined subgroups in the systematic review and meta-analysis of LNG-IUD versus oral LNG for emergency contraception, incorporating studies conducted across various settings and published through December 2024. Each study contributes its number of events, total sample size, and corresponding proportion with 95% confidence intervals.



Noninferiority Testing

The noninferiority test comparing the LNG-IUD with oral LNG resulted in a pooled difference in pregnancy rates of −0.055, with a 95% confidence interval of −0.117 to 0.008. Because the upper boundary of 0.008 is below the noninferiority margin of 1%, the LNG-IUD met criteria for noninferiority.

Synthesis of Findings

A random-effects model estimated an overall pregnancy proportion of 1% or less, with no significant differences among the LNG-IUD, oral LNG, and copper IUD subgroups (P=0.20). Both the LNG-IUD and copper IUD showed pregnancy proportions under 1%, whereas oral LNG demonstrated a higher but still low estimated proportion (<15%). Noninferiority testing further showed that the LNG-IUD was noninferior to oral LNG, as the upper bound of the pooled difference in pregnancy rates (0.008) remained below the predefined 1% noninferiority margin. Overall, these results indicate that the LNG-IUD does not result in a clinically important increase in pregnancy risk as compared with oral LNG when used for emergency contraception.

Discussion

Main Findings

This systematic review and meta-analysis provides an overview of the comparative efficacy of the LNG-IUD versus oral LNG as EC methods, summarizing the current evidence in this emerging field. Owing to the limited availability of studies directly comparing the LNG-IUD with oral LNG EC, studies that compared copper IUDs with the LNG-IUD and oral LNG as EC were used for subgroup formation. This review found no significant difference in the proportion of pregnancies between the LNG-IUD and oral LNG for EC (P=0.20), supporting the LNG-IUD as a viable EC option. In addition, noninferiority testing revealed the LNG-IUD as a noninferior option to oral LNG, because the upper bound of the difference in pregnancy rates was less than 1%.

Strengths and Limitations

The oral LNG pill and ulipristal acetate are currently the only FDA-approved forms of EC.[2] However, the copper IUD is traditionally regarded as the most effective EC method.[14] Despite its high efficacy, copper IUD insertion is often associated with side effects such as heavier menstrual bleeding, increased cramping, and back pain.[25,26] In contrast, the LNG-IUD is generally associated with lighter periods or amenorrhea, which may increase its acceptability among some patients.[25,26]

The LNG-IUD additionally offers the dual benefit of providing both immediate EC and long-term reproductive control, positioning it as a convenient, singular solution for women not seeking pregnancy.[14] Although the oral LNG EC pill remains widely accessible and convenient, its efficacy is lower than that of IUD-based methods, particularly when administered later within the 72-hour window.[27] This discrepancy highlights the importance of careful clinical decision making and patient counseling. Our analysis contributes emerging evidence supporting the LNG-IUD as a viable EC option. However, the lack of direct comparative studies between the LNG-IUD and oral LNG highlights a critical gap in the literature, limiting definitive conclusions about their relative effectiveness.

A key strength of this meta-analysis is the inclusion of both randomized and nonrandomized trials comparing LNG and copper-based methods, providing a comprehensive and balanced evaluation. Adhering to PRISMA guidelines ensured methodologic rigor, whereas broad search strategies across multiple databases minimized the likelihood of missing relevant studies. The efficacy of contraceptive methods was evaluated with validated statistical and graphical techniques, enhancing the credibility of the findings. In addition, the use of robust statistical methods — including random-effects modeling with heterogeneity assessment (I^2, τ^2, and Q test), weighted proportion estimates with 95% confidence intervals, moderator analyses, funnel-plot diagnostics, tests for asymmetry, and noninferiority testing conducted through the metafor package in R software, version

4.5.1 — further strengthened the analytic rigor and reliability of the results.

Several limitations were identified. The funnel plot demonstrated apparent asymmetry, and the test for funnel-plot asymmetry yielded a P value of 0.0001, suggesting potential publication bias. Although PRISMA guidelines were rigorously followed, multiple sources of bias may still have been introduced. Few studies directly compared the LNG-IUD with oral LNG, resulting in reliance on indirect comparisons that may increase variability. The number of LNG-IUD studies was limited, and the included studies varied in design, sample size, and methodology, which constrains overall generalizability. Across studies, participant populations were geographically restricted, primarily to North America and Egypt, and demographically narrow, consisting predominantly of young, reproductive-aged women, with limited racial and ethnic diversity reported and minimal information on socioeconomic or educational background. Where race was reported in most studies, samples were largely White. These population characteristics limit the applicability of findings to more diverse populations, including older reproductive-aged individuals and those from underrepresented racial, socioeconomic, and geographic groups. The lack of control for demographic and socioeconomic variables may have further contributed to bias and limited the robustness of the results.

Conclusion

These findings support the potential of the LNG-IUD as an effective method of EC, demonstrating the LNG-IUD as a noninferior option to oral LNG. Although the LNG-IUD is not currently approved by the FDA for use as EC, it represents a promising option offering both immediate and sustained contraceptive benefits. In addition, increasing emergency contraception options can lead to increased availability for patients. Future research should prioritize randomized, controlled trials with extended follow-up periods to directly compare the LNG-IUD and oral LNG in terms of EC effectiveness and long-term outcomes. Expanding the range of available EC methods may substantially enhance reproductive health care for women by accommodating the diverse needs and preferences of patients. In current practice, clinicians should continue to balance benefits, patient values, and resource availability when determining the most appropriate EC method.

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Supplemental

Appendix 1. Databases and Search Terms.

Database	Search Terms
PubMed	("Contraception, Postcoital"[Mesh] OR emergenc*[tiab] OR postcoital[tiab] OR "post-coital"[tiab] OR "post coital"[tiab]) AND ("Levonorgestrel"[Mesh] OR Levonorgestrel[tiab] OR "l-Norgestrel"[tiab] OR "l Norgestrel"[tiab] OR "D-Norgestrel"[tiab] OR "D Norgestrel"[tiab] OR Microval[tiab] OR Microlut[tiab] OR Mirena[tiab] OR Norgeston[tiab] OR "Norplant-2"[tiab] OR "Norplant 2"[tiab] OR Norplant2[tiab] OR NorLevo[tiab] OR Norplant[tiab] OR Vikela[tiab] OR Cerazet[tiab] OR Capronor[tiab] OR "ulipristal acetate"[tiab] OR "Plan B"[tiab]) AND ("Intrauterine Devices"[Mesh] OR "Intrauterine Devices, Medicated"[Mesh] OR intrauterine[tiab] OR IUD[tiab]) AND ("Contraceptives, Oral"[Mesh] OR oral*[tiab] OR pill*[tiab])
Scopus	(INDEXTERMS("Contraception, Postcoital") OR TITLE-ABS(emergenc*) OR TITLE-ABS(postcoital) OR TITLE-ABS(post-coital) OR TITLE-ABS("post coital")) AND (INDEXTERMS(Levonorgestrel) OR TITLE-ABS(Levonorgestrel) OR TITLE-ABS(l-Norgestrel) OR TITLE-ABS("l Norgestrel") OR TITLE-ABS(D-Norgestrel) OR TITLE-ABS("D Norgestrel") OR TITLE-ABS(Microval) OR TITLE-ABS(Microlut) OR TITLE-ABS(Mirena) OR TITLE-ABS(Norgeston) OR TITLE-ABS(Norplant-2) OR TITLE-ABS("Norplant 2") OR TITLE-ABS(Norplant2) OR TITLE-ABS(NorLevo) OR TITLE-ABS(Norplant) OR TITLE-ABS(Vikela) OR TITLE-ABS(Cerazet) OR TITLE-ABS(Capronor) OR TITLE-ABS("ulipristal acetate") OR TITLE-ABS("Plan B")) AND (INDEXTERMS("Intrauterine Devices") OR INDEXTERMS("Intrauterine Devices, Medicated") OR TITLE-ABS(intrauterine) OR TITLE-ABS(IUD)) AND (INDEXTERMS("Contraceptives, Oral") OR TITLE-ABS(oral*) OR TITLE-ABS(pill*))
Medline (Ovid)	(exp "Contraception, Postcoital"/ OR emergenc*.tw. OR postcoital.tw. OR post-coital.tw. OR "post coital".tw.) AND (exp Levonorgestrel/ OR Levonorgestrel.tw. OR l-Norgestrel.tw. OR "l Norgestrel".tw. OR D-Norgestrel.tw. OR "D Norgestrel".tw. OR Microval.tw. OR Microlut.tw. OR Mirena.tw. OR Norgeston.tw. OR Norplant-2.tw. OR "Norplant 2".tw. OR Norplant2.tw. OR NorLevo.tw. OR Norplant.tw. OR Vikela.tw. OR Cerazet.tw. OR Capronor.tw. OR "ulipristal acetate".tw. OR "Plan B".tw.) AND (exp "Intrauterine Devices"/ OR exp "Intrauterine Devices, Medicated"/ OR intrauterine.tw. OR IUD.tw.) AND (exp "Contraceptives, Oral"/ OR oral*.tw. OR pill*.tw.)

Database	Search Terms
ClinicalTrials.gov	(("Emergency Contraception" OR "Postcoital Contraception" OR emergenc* OR postcoital OR "post-coital" OR "post coital") AND ("Levonorgestrel" OR "LNG" OR "LNG-IUD" OR "Levonorgestrel IUD" OR "Levonorgestrel Intrauterine Device" OR "Mirena" OR "Kyleena" OR "Skyla" OR "Jaydess" OR "Norplant" OR "NorLevo" OR "Plan B" OR "ulipristal acetate") AND ("Intrauterine Device" OR "IUD" OR "Medicated IUD" OR "Copper IUD" OR "Hormonal IUD" OR "Oral Contraceptive" OR "Oral Levonorgestrel" OR "Oral Contraceptive Pill"))

Appendix 2. MMAT Questions Assessing Bias.

Category	Assessment Question
Screening questions	Are there clear research questions?
Screening questions	Do the collected data allow the research questions to be addressed?
Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?
Quantitative randomized controlled trials	2.2. Are the groups comparable at baseline?
Quantitative randomized controlled trials	2.3. Are there complete outcome data?
Quantitative randomized controlled trials	2.4. Are outcome assessors blinded to the intervention provided?
Quantitative randomized controlled trials	2.5. Did the participants adhere to the assigned intervention?
Quantitative non-randomized studies	3.1. Are the participants representative of the target population?
Quantitative non-randomized studies	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?
Quantitative non-randomized studies	3.3. Are there complete outcome data?
Quantitative non-randomized studies	3.4. Are the confounders accounted for in the design and analysis?
Quantitative non-randomized studies	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?

Risk of bias was assessed by 2 independent reviewers with "Yes" or "No" responses to the provided questions based on study design/category. If there was uncertainty, the question was provided with the article to a third author for confirmation of "Yes/No" response.

Appendix 3. Study Characteristics.

Title	Authors (Year)	Study Design	EC Used and Timing	Geography	Sample Size	Mean Age (years)	Unprotected Intercourse Timing	Race and Ethnicity
A pilot study of the Copper T380A IUD and oral levonorgestrel for emergency contraception	Turok D.K., et al (2010)	Prospective Observational Study	Oral LNG vs Copper IUD 1 and 6 months	Utah	Oral LNG: 34 Copper IUD: 23	Oral LNG: 23 Copper IUD: 24.7	< 120 hours	Oral LNG: White (20), Hispanic (11), Asian (3) Copper IUD: White (15), Hispanic (6), Asian (1), Hawaiian (1)
Intrauterine Device Versus Levonorgestrel As Emergency Contraception. Observational Study	Elnasar, I., et al, (2021)	Prospective Observational Study	Oral LNG vs Copper IUD 3 months	Egypt	Oral LNG: 100 Copper IUD: 100	Oral LNG: 27 Copper IUD: 26.7	< 120 hours	Not reported
Emergency contraception with a copper IUD or oral levonorgestrel: an observational study of 1 year pregnancy rates	Turok, D.K., et al (2013)	Prospective Observational Study	Oral LNG vs Copper IUD 1 year	Utah	Oral LNG: 327 Copper IUD: 215	Oral LNG: 22 Copper IUD: 23.1	< 120 hours	Oral LNG: White (212), Hispanic (68) Copper IUD: White (144), Hispanic (36)
Levonorgestrel Intrauterine System For Emergency Contraception (LIFE)	Planned Parenthood (2024)	Randomized Controlled Trial	LNG IUD vs Ulipristal Acetate 5–6 weeks	United States	LNG IUD: 183 Ulipristal Acetate: 73	LNG IUD: 27.7 Ulipristal Acetate: 27.1	< 120 hours	LNG IUD: African American (66), White (93), Other (23), Hispanic (168) Ulipristal Acetate: African American (40), White (26), Other (7), Hispanic (68)

Title	Authors (Year)	Study Design	EC Used and Timing	Geography	Sample Size	Mean Age (years)	Unprotected Intercourse Timing	Race and Ethnicity
Levonorgestrel vs. Copper Intrauterine Devices for Emergency Contraception	Turok, D.K., et al (2021)	Randomized Controlled Trial	Copper IUD vs LNG IUD 1 month	Utah	Copper IUD: 321 LNG IUD: 317	Copper IUD: 23.9 LNG IUD: 24	< 120 hours	Copper IUD: White (190), Hispanic (98), African American (12), Other (29) LNG IUD: White (179), Hispanic (108), African American (12), Other (28)

UPI denotes unprotected intercourse.