

Levonorgestrel vs. Copper Intrauterine Devices for Emergency Contraception

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ORIGINAL ARTICLE

Levonorgestrel vs. Copper Intrauterine Devices for Emergency Contraception

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Background:

- Oral levonorgestrel and oral ulipristal acetate are the two approved emergency contraception methods in the US.
- Copper IUD is an effective alternative, failing to prevent pregnancy in less than 0.1% of cases.
- If levonorgestrel IUD for is used for emergency contraception, woman are advised to take concomitant oral emergency contraception.
- levonorgestrel IUD can reduce menstrual bleeding and discomfort.

Method:

- Randomized trial at six clinics in Utah contraception from August 2016 to December 2019.
- Intention-to-treat analysis
- included women who sought emergency contraception after at least one episode of unprotected intercourse within 5 days before presentation and agreed IUD placement.

Inclusion criteria:

- Woman aged between 18 and 35
- Fluent in English or Spanish
- Were requesting emergency contraception after unprotected sexual intercourse within the previous 5 days
- Desire to initiate use of an IUD
- Desire to prevent pregnancy for at least 1 year
- A negative urine pregnancy test
- History of regular menstrual cycles (21 to 35 days)
- Known date of the last menstrual period (+-3 days)

Exclusion criteria:

- Breast-feeding
- Vaginal bleeding of unknown cause
- Current use of a highly effective method of contraception (sterilization, IUD, or contraceptive implant)
- Intrauterine infection in the previous 3 months
- Untreated *Neisseria gonorrhoea* or *Chlamydia trachomatis* infection in the previous 30 days
- Allergy to copper
- Use of oral emergency contraception in the preceding 5 days
- Known uterine cavity anomalies

Trial procedures:

- All participants had a negative urine pregnancy test before IUD placement.
- They were randomly assigned 1:1 ratio to levonorgestrel or copper IUD placement.
- Participants conducted a home urine pregnancy test and complete the 1-month follow-up survey 27 days after the enrollment.
- Later at the 1-month office visit, the research staff performed a urine pregnancy test for them.
- If researchers failed to contact the participants, they tried to review the health record to assess IUD use and pregnancy status.

Statistical analysis:

- intention-to-treat analysis
- modified intention-to-treat analysis
- sensitivity analysis

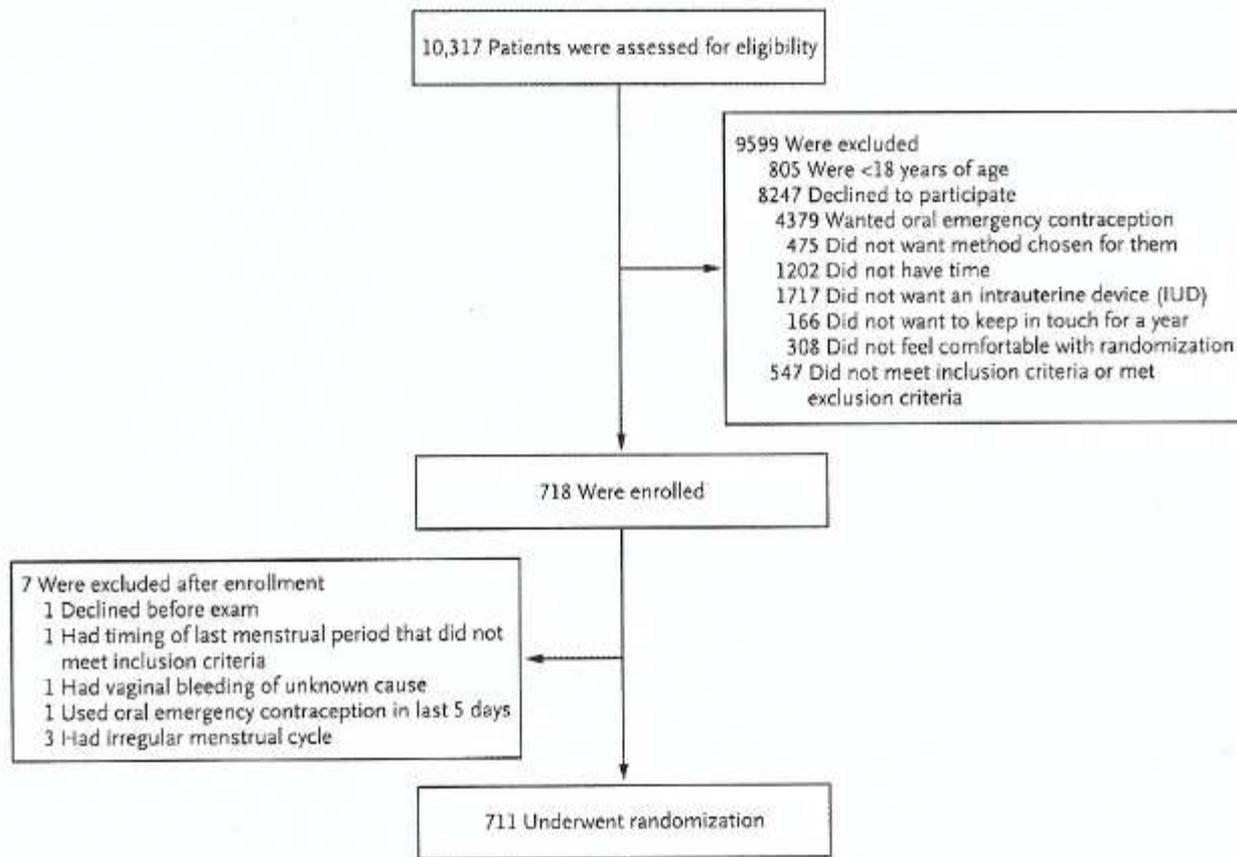
Primary and secondary outcomes:

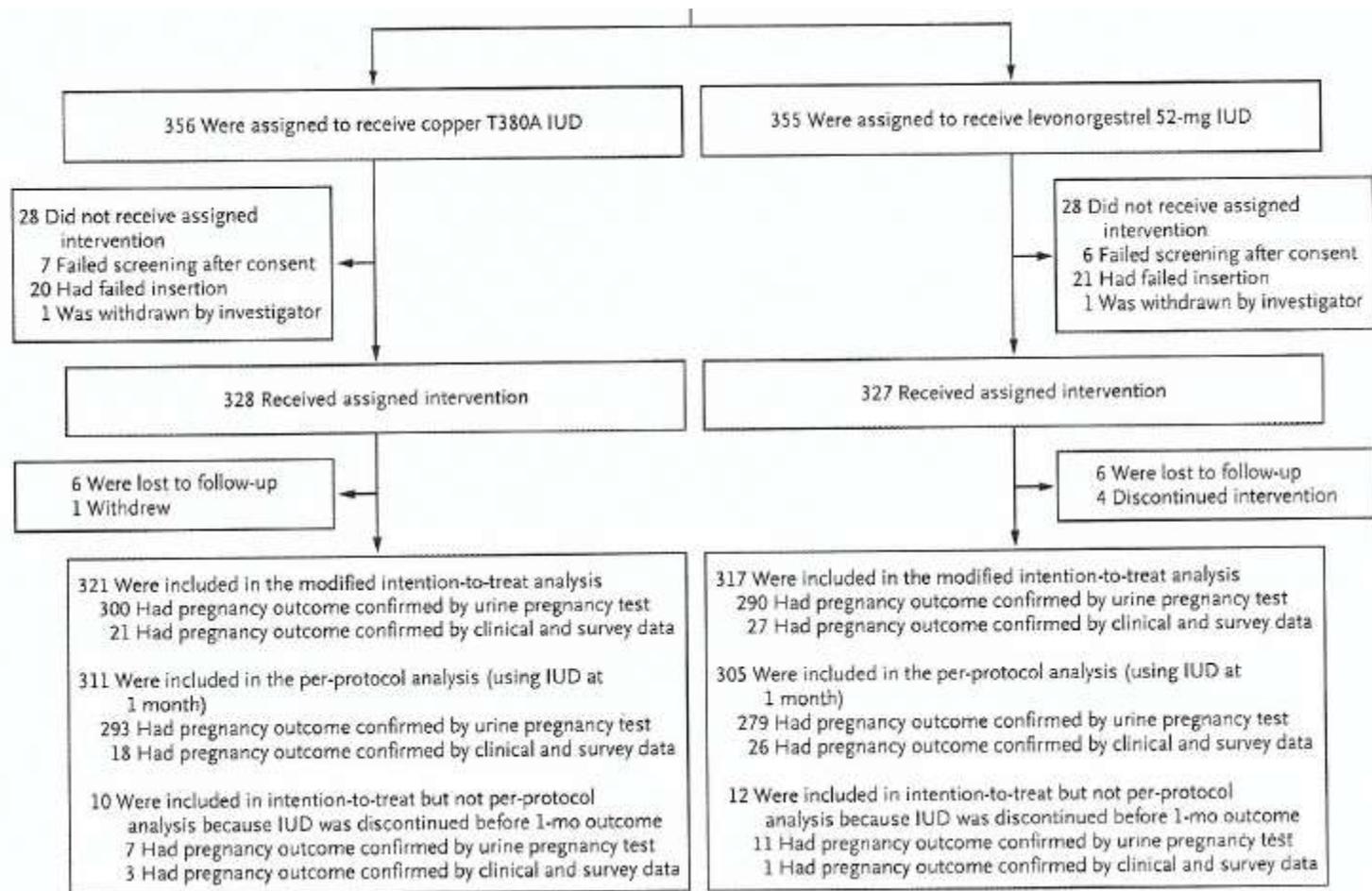
Primary outcome:

Positive urine pregnancy test 1 month after IUD insertion.

Secondary outcome:

IUD expulsion, IUD removal, participant satisfaction level, pain and bleeding and spotting in the first month of IUD use.



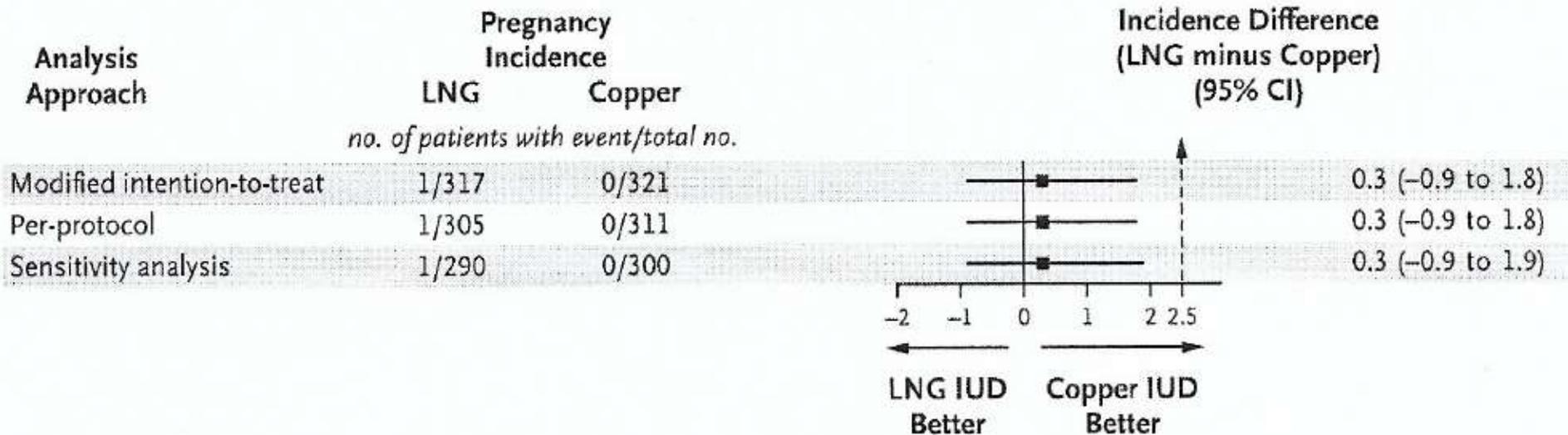


Baseline characteristics:

Table 1. Characteristics of the Participants at Enrollment.*

Characteristic	Levonorgestrel IUD (N=327)	Copper IUD (N=328)
Age — yr	24.0±4.9	23.9±4.6
Body-mass index — no. (%)†		
<25	168 (51.4)	155 (47.3)
25 to 29.9	70 (21.4)	85 (25.9)
≥30	89 (27.2)	88 (26.8)
Education — no./total no. (%)		
High school or less	169/326 (51.8)	168/326 (51.5)
Attending college	123/326 (37.7)	120/326 (36.8)
College degree or higher	34/326 (10.4)	38/326 (11.7)
Annual income — no./total no. (%)		
<\$12,000	133/326 (40.8)	141/326 (43.3)
\$12,000 to \$35,999	151/326 (46.3)	152/326 (46.6)
≥\$36,000	42/326 (12.9)	33/326 (10.1)
Race or ethnic group — no. (%)‡		
White	179 (54.7)	190 (57.9)
Hispanic or Latinx	108 (33.0)	98 (29.9)
Black or African American	12 (3.7)	12 (3.7)
Other	28 (8.6)	28 (8.5)
Relationship status — no./total no. (%)		
Married	16/326 (4.9)	21/326 (6.4)
Living together or in committed relationship	112/326 (34.4)	107/326 (32.8)
Single or actively dating	169/326 (51.8)	171/326 (52.5)
Divorced or separated	17/326 (5.2)	18/326 (5.5)
Other or did not answer	12/326 (3.7)	9/326 (2.8)
Reason for seeking emergency contraception — no./total no. (%)		
Did not use any method at last sexual intercourse	132/324 (40.7)	165/327 (50.5)
Incorrect use of rhythm or withdrawal method	61/324 (18.8)	68/327 (20.8)
Condom broke	61/324 (18.8)	41/327 (12.5)
Ran out of contraception or missed dose	15/324 (4.6)	8/327 (2.4)
Did not plan or was forced to have sexual intercourse	40/324 (12.3)	28/327 (8.6)
Other	15/324 (4.6)	17/327 (5.2)

Results: (Primary outcome)



Results: (Secondary outcomes)

Table 2. Clinical Outcomes among Users of Emergency Contraception in the First Month after IUD Placement.*

Outcome	Levonorgestrel IUD (N=327)	Copper IUD (N=328)	Unadjusted Mean Difference (95% CI)	Unadjusted Risk Difference % (95% CI)	Adjusted Mean Difference (95% CI)†	Adjusted Risk Difference % (95% CI)†
IUD expulsion — no. (%)	2 (0.6)	3 (0.9)		-0.3 (-1.6 to 1.0)¶		-0.3 (-1.5 to 1.0)
IUD removal — no. (%)	10 (3.1)	8 (2.5)		0.6 (-1.9 to 3.1)¶		1.0 (-1.5 to 3.6)
Participant satisfaction level — no./total no. (%)						
Very satisfied	42/308 (13.6)	50/307 (16.3)		-2.9 (-8.4 to 2.6)**		-0.28 (-8.3 to 2.8)††
Satisfied	116/308 (37.7)	119/307 (38.8)		-1.2 (-9.0 to 6.5)**		-1.5 (-9.4 to 6.4)††
Neutral	107/308 (34.7)	88/307 (28.7)		6.3 (-1.1 to 13.7)**		6.2 (-1.3 to 13.7)††
Unsatisfied	23/308 (7.5)	22/307 (7.2)		0.3 (-3.8 to 4.3)**		0.3 (-3.9 to 4.4)††
Very unsatisfied	20/308 (6.5)	28/307 (9.1)		-2.8 (-7.1 to 1.4)**		-2.6 (-6.8 to 1.7)††
Pain						
Pain associated with IUD since inser- tion — no./total no. (%)	210/308 (68.2)	207/306 (67.7)			1.0 (0.7 to 1.4)**	1.0 (0.7 to 1.4)††
Cramping since insertion‡	59.5±1.9	66.6±1.8	-9.9 (-15.2 to -4.6)**		-10.3 (-15.6 to -4.9)††	
Sharp pain since insertion‡	66.6±1.4	72.5±1.3	-8.6 (-12.9 to -4.4)**		-9.0 (-13.2 to -4.8)††	
Bleeding and spotting days in first month of IUD use§						
No. of bleeding days	10.8±0.5	7.2±0.3	3.5 (2.4 to 4.6)**		3.5 (2.4 to 4.6)††	
No. of spotting days	11.0±0.6	5.7±0.3	5.2 (3.7 to 6.4)**		5.4 (3.8 to 6.9)††	

Adverse events:

Table 3. Adverse Events Resulting in Request for Medical Care during the First Month of IUD Use.

Event	Levonorgestrel IUD (N=327)	Copper IUD (N=328)
	<i>number (percent)</i>	
Total events*	17 (5.2)	16 (4.9)
Type of event		
Bleeding	2 (0.6)	1 (0.3)
Bleeding and cramping	3 (0.9)	2 (0.6)
Bleeding and pain	0	3 (0.9)
Cramping	4 (1.2)	1 (0.3)
Pain	3 (0.9)	3 (0.9)
Vulvovaginal infection	1 (0.3)	2 (0.6)
Urinary tract infection	0	2 (0.6)
Concerns related to IUD†	3 (0.9)	1 (0.3)
Nausea	1 (0.3)	0
Headache	1 (0.3)	0
Pruritus or dermatologic condition	0	2 (0.6)
Depressed mood	1 (0.3)	0
Ovarian cyst	1 (0.3)	0
Swollen lymph nodes	1 (0.3)	0

Conclusion:

levonorgestrel IUD was noninferior to the copper IUD for emergency contraception.

Strength:

- Use of RCT. RCT can minimise a lot of different bias and facilitates blinding of the treatments given.
- They gather the information from three large clinics.
- The sample size is large.
- Tried to reduce the lost to follow up by a comprehensive survey and health record data to determine pregnancy status.

Limitation:

- Some participants were informed of their IUD type before they completed their follow-up survey.
- Selection bias is possible as only 7% of the clinic patients seeking emergency contraception enrolled in this trial.
- Limited generalizability. They exclude patients outside the age of 18-35 and those with irregular menstrual cycles.
- While oral medications are still the major means of emergency contraception, the study did not compare the effectiveness of IUD versus those oral medications.

Emergency contraception in Hong Kong:

- commonly Progestogen and Ulipristal acetate
- According to FPA, copper IUD is another effective alternative.

Area to explore:

- effectiveness in asian population
- cost of levonorgestrel IUD

Thank you very much.