Original Research

Effect of Immediate Compared With Delayed Insertion of Etonogestrel Implants on Medical Abortion Efficacy and Repeat Pregnancy

A Randomized Controlled Trial

Elizabeth G. Raymond, MD, MPH, Mark A. Weaver, PhD, Yi-Ling Tan, MPH, Karmen S. Louie, Manuel Bousiéguez, MBA, Elba M. Lugo-Hernández, MD, Ana Gabriela Aranguré-Peraza, MD, Patricio Sanhueza, MD, Clair Kaplan, MSN, APRN, Sarita Sonalkar, MD, MPH, Alisa B. Goldberg, MD, MPH, Kelly R. Culwell, MD, MPH, Lisa Memmel, MD, MS, Roxanne Jamshidi, MD, MPH, and Beverly Winikoff, MD, MPH

OBJECTIVE: To evaluate the effect of insertion of etonogestrel implants with mifepristone compared with after the abortion on the risks of medical abortion failure and repeat pregnancy over the subsequent 6 months.

METHODS: In a randomized trial, we assigned patients undergoing medical abortion to receive etonogestrel implants either with the mifepristone (Quickstart group) or after the abortion (Afterstart group). We followed them for 7 months to ascertain abortion outcome, pregnancies, and contraception use.

RESULTS: Between September 2013 and August 2014, we enrolled 236 participants in the Quickstart group and 240 in the Afterstart group. To examine abortion failure, we conducted a noninferiority analysis from which we excluded nine participants who had missing outcome data and four with specified protocol violations. Of the rest, 9 of 229 (3.9%) and 9 of 234 (3.8%) in the Quickstart and Afterstart groups, respectively, had surgery to complete the abortion; the difference of 0.08% (90% confidence interval −3.1% to 3.3%) excluded our prestipulated noninferiority margin of 5 percentage points. Among participants with pregnancy follow-up through 6 months, 1 of 213 (0.5%) and 3 of 208 (1.4%) in the Quickstart and Afterstart groups, respectively, became pregnant within that time; 6-month pregnancy rates did not differ significantly by group (exact log-rank test, P=.28). At enrollment, significantly more participants in the Quickstart group than in the Afterstart group were satisfied with their group

From Gynuity Health Projects, New York, New York; the Departments of Medicine and Biostatistics, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina; Secretariat of Health, Mexico City, Mexico; Planned Parenthood of Southern New England, New Haven, Connecticut; Perelman School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania; Planned Parenthood League of Massachusetts, Boston, Massachusetts; Planned Parenthood of the Pacific Southwest, San Diego, California; Planned Parenthood Northern California, San Rafael, California; and Johns Hopkins University, Baltimore, Maryland.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of Planned Parenthood Federation of America, Inc. This study was funded by an anonymous donor.

Presented at the 2015 National Abortion Federation Annual Meeting, April 18–21, 2015, Baltimore Maryland; the XXI FIGO World Congress of Obstetrics and Gynecology, October 4–9, 2015 Vancouver, British Columbia, Canada; the Fifth Research Meeting on Unwanted Pregnancy and Unsafe Abortion: Public Health Challenges in Latin America and the Caribbean, September 28–30, 2015, Mexico City, Mexico; and the North American Forum on Family Planning, November 14–16, 2015, Chicago, Illinois.

The authors thank the following clinical personnel who were instrumental in collecting study data: Teresa López Flores and Maribel Martínez-Jiménez, Secretariat of Health, Mexico City; L. Fields, D. Freedman-Shara, G. Ward, J. Wilder, and S. Dobson, Planned Parenthood of Southern New England; Planned Parenthood of the Pacific Southwest Chula Vista Health Center; Jessica McClusky, Boston Medical Center; Jennifer Fortin and Sarah McKetta, Planned Parenthood League of Massachusetts; Margarita Avelar and Mariela Garcia, Planned Parenthood Northern California; and Torri Ross, Johns Hopkins University. The authors also thank the members of the Advisory Board, including Alison Edelman, Oregon Health Sciences University, and Matthew Reeves, National Abortion Federation, and Jennifer Britton, who managed study data at Gynuity.

Corresponding author: Elizabeth G. Raymond, MD, MPH, Gynuity Health Projects, 15 East 26th Street, Suite 801, New York, NY 10010, USA; e-mail: eraymond@gynuity.org.

Financial Disclosure

Dr. Jamshidi is a Nexplanon trainer (Merck). The other authors did not report any potential conflicts of interest.

ISSN: 0029-7844/16

assignments (187/236 [79%] compared with 129/240 [54%], respectively; $P<.001$).

CONCLUSION: Insertion of etonogestrel implants with mifepristone did not appreciably increase medical abortion failure risk and it enhanced patient satisfaction, but we found no evidence that it decreased repeat pregnancy rates.

CLINICAL TRIAL REGISTRATION: ClinicalTrials.gov, www.clinicaltrials.gov, NCT01902485.

(Obstet Gynecol 2016;127:306–12)
DOI: 10.1097/AOG.0000000000001274

Providing implants after medical abortion can be challenging because many patients miss their scheduled follow-up appointments.[1] If the method could be administered when a patient first presents to the clinic for the abortion, uptake could possibly be increased and the risk of subsequent unintended pregnancy thereby reduced. Starting a contraceptive immediately when a woman expresses her desire to use it rather than delaying to a later date–an approach termed "quickstart"[2–4]–has shown such benefits in other contexts.[5–7]

However, theoretically, insertion of a progestin-containing implant concurrently with administration of mifepristone, an antiprogestin, could impair the abortifacient efficacy of the mifepristone. Data regarding this potential drug interaction are scant and inconclusive. In a case-series study of patients undergoing medical abortion treated with etonogestrel implants immediately after mifepristone administration, all 16 patients with follow-up had uncomplicated complete abortions.[8] In contrast, two cohort studies that contained 78[9] and 119[10] participants found trends toward more extra treatment to complete the abortions in women who received etonogestrel implants with mifepristone than in those who did not.

We conducted a randomized trial to assess both the risks and benefits of quickstart of etonogestrel implants in patients undergoing first-trimester medical abortion. Our primary objectives were to evaluate whether inserting the implants on the same day as mifepristone rather than requiring women to delay would affect two primary outcomes: the risk of medical abortion failure (surgery to complete the pregnancy termination) and the probability of repeat pregnancy during the subsequent 6 months.

MATERIALS AND METHODS

We conducted the randomized trial in the United States and Mexico between 2013 and 2015. The trial was approved by the Chesapeake Institutional Review Board, Boston University Medical Center Institutional Review Board, Johns Hopkins Medicine Institutional Review Board, and the Comisión de Ética en Investigación de la Secretaría de Salud del Distrito Federal. The study was monitored by a five-member advisory board.

Women were eligible for the trial if they were appropriate candidates for outpatient medical abortion with mifepristone and misoprostol according to the study site standards, intended to take mifepristone on the day of study enrollment, did not have recognized nonviable pregnancies, desired etonogestrel implants for postabortion contraception, and did not plan to use hormonal contraceptives before implant insertion. The abortifacient regimen was 200 mg mifepristone orally followed by misoprostol 800 micrograms buccally 1–2 days later.

After obtaining informed consent, staff interviewed each volunteer. If she was eligible, staff opened a numbered, opaque randomization envelope containing a group assignment. The one-to-one randomization scheme was stratified by site and used randomly permuted block sizes of 12 and 20 generated by computer before enrollment started. Participants in the Quickstart group received implants containing 68 mg etonogestrel after ingesting mifepristone and before leaving the study site. Participants in the Afterstart group were required to wait until the abortion was complete. Participants returned for follow-up per each site's standard protocol; the study provided no criteria to diagnose complete abortion. Study data were collected in person or by phone within 1 month and at 4 and 7 months after enrollment. Each participant was asked to perform a urine pregnancy test immediately before her final study contact. Participants received compensation for completing scheduled contacts.

An independent clinician masked to group assignment reviewed records from participants who received abortifacient treatment other than the initially dispensed drugs.

We calculated that 475 participants would provide 80% power to allow us to conclude with 95% confidence that the medical abortion failure rate was no more than 5 percentage points higher in the Quickstart group than in the Afterstart group, assuming 4% true failure rates in both groups and 20% or less loss to follow-up.[11] This number provided at least 71% power to detect a 5 percentage point difference in pregnancy rates between groups if the rate in the Afterstart group was 6% or less using a two-sided test at the 5% significance level. We made no adjustments for multiple comparisons.

Analyses followed a plan written before the trial. The primary analysis for medical abortion failure was

a noninferiority analysis that tested the null hypothesis that the proportion of patients in the Quickstart group who had surgery to complete the abortion would be at least 5 percentage points higher than the proportion in the Afterstart group, compared with the alternative that the difference would be less than 5 percentage points by estimating the difference with an exact 90% confidence interval. We selected 5 percentage points because we considered that difference clinically important. We considered a participant to have a known abortion outcome if she had extra medical or surgical treatment to complete the abortion or if she was evaluated by ultrasonography, pelvic examination, pregnancy test, or a contact more than 60 days after enrollment. The primary analysis excluded participants without known abortion outcomes, participants in the Quickstart group who did not receive implants at enrollment, and participants in the Afterstart group who used hormonal contraception within 6 days after enrollment. Sensitivity analyses included all randomized participants with worst-case imputation for those with missing outcomes (ie, that they had abortion failures if in the Quickstart group and successes in the Afterstart group).

Secondary analyses similarly estimated differences between groups in the proportion who received any extra treatment to complete the abortion and who had ongoing pregnancy after initial treatment.

The analysis of the 6-month probability of pregnancy included all participants who provided relevant data. We estimated conception dates using ultrasound data if available or menstrual dates. We defined a participant as having "evidence of nonpregnancy" at 6 months if she had a negative pregnancy test at 197 days or later; was using sterilization, implants, an intrauterine device, or an injectable method at 183 days; or had a first reported pregnancy conceived later than 183 days after enrollment. Otherwise, if a participant had a contact at 183 days or later with no reported pregnancy, we considered her to have "no evidence of pregnancy." We used an exact log-rank test to compare pregnancy probabilities between groups.

We compared contraceptive use patterns and other outcomes in the two groups using χ^2, Fisher exact, or nonparametric Wilcoxon rank-sum tests. With few events, we were unable to assess differential effects of group assignment on abortion failure and pregnancy by country, but we tested interactions by country for other outcomes using Breslow-Day tests for homogeneity.

All analyses maintained each participant in her randomly assigned group. We used StatXact 8 for exact confidence intervals and exact log-rank tests and SAS 9.3 for all other analyses.

The funder had no role in the development of the study question or the study design or in the collection, storage, or analysis of data. The data are stored at Gynuity Health Project and are fully accessible to the authors.

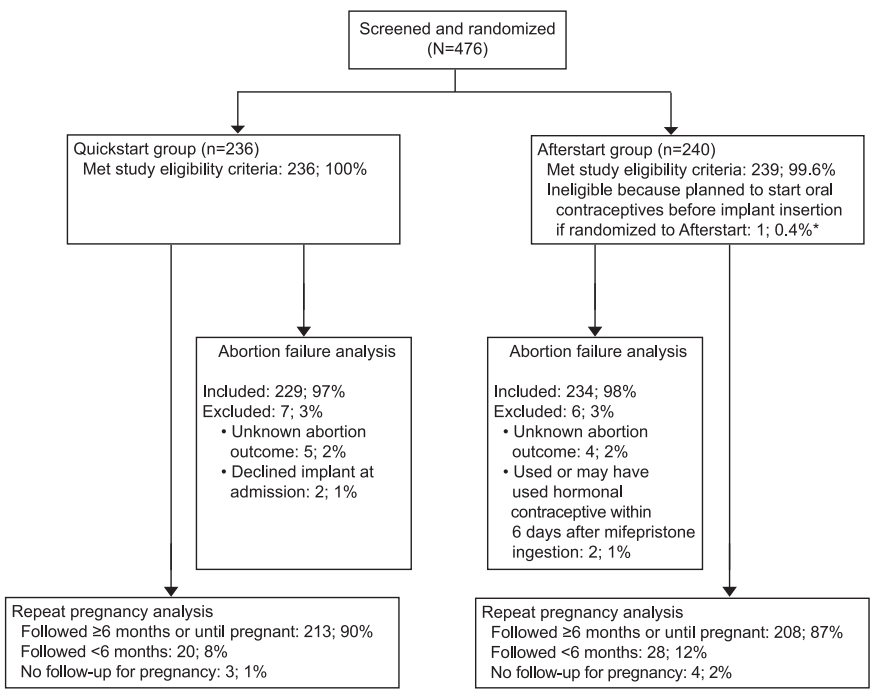

Fig. 1. Disposition of study participants. Percentages may not equal 100 as a result of rounding. *Participant did not ultimately take any hormones within 6 days after the mifepristone and thus was retained in the abortion failure analysis.

Raymond. Quickstart of Implants in Medical Abortion. Obstet Gynecol 2016.

RESULTS

The trial included 476 participants (Fig. 1) who had diverse demographic characteristics and reproductive histories (Table 1). Nearly 90% of the participants were enrolled in Mexico. Participants in Mexico were more likely than those in the United States to have had less than 12 years of education (at least 45.9% compared with 9.8%, respectively) and were less likely to have previously used depot medroxyprogesterone acetate (0.9% compared with 39%, respectively) and to have had a prior abortion (30% compared with 61%; $P<.05$ for all three comparisons).

The analysis of medical abortion failure excluded 13 participants (Fig. 1). The four excluded participants who had known abortion outcomes all had successful medical abortions with no additional treatment. All 463 included participants took the misoprostol provided at enrollment. Abortion outcomes after the initial doses of mifepristone and misoprostol were assessed by ultrasonography in 205 of 229 participants (90%) in the Quickstart group and 216 of 234 (92%) in the Afterstart group. The proportions who had surgery to complete the abortion were similar in the two groups (Table 2). The upper 90% confidence limit around the difference between these proportions was 3.3%, which provided 95% confidence that our null hypothesis that the quickstart approach increases the risk of surgery by greater than 5 percentage points should be rejected (Table 3). Our sensitivity analysis found that, if up to three of seven excluded participants in the Quickstart group and zero of six in the Afterstart group had abortion failures, the null hypothesis still would have been rejected.

Our analysis also provided 95% confidence that the proportion of participants who had any extra treatment (surgical or medical) to complete the abortion and the proportion who had ongoing pregnancies were both no more than 5 percentage points higher in the Quickstart group than in the Afterstart group (Table 3).

In each group, three of the nine participants who had surgery to complete the abortion had gestational ages of 64 days or greater at enrollment. On record review, the independent reviewer confirmed that five of the nine surgeries in each group (56%) were definitely or probably needed, as were 1 of 12 and 2 of 17 of the extra medical treatments in the Quickstart and Afterstart groups, respectively.

The median time to surgery was 15 days in the Quickstart group (range 1–34 days) and 14 days in the Afterstart group (range 1–28 days). The median days of bleeding was significantly higher in the Quickstart group than in the Afterstart group (12 compared with 10, respectively; $P=.03$). The incidence of heavy bleeding (Table 2) was nearly identical in the two groups. We found no significant difference between groups in abortion-related pain severity or in the proportion of participants who made more than one postenrollment clinical visit (Table 2).

Participants in the Quickstart group were significantly more satisfied with their group assignment than participants in the Afterstart group (Table 4).

Abortion outcomes did not differ appreciably by country. We found no significant interactions between group and country with regard to postabortion bleeding, pain, or satisfaction ($P>.1$ for each outcome).

We ascertained pregnancy status through 6 months for 421 (88%) enrolled participants (Table 5).

Table 1. Characteristics of Enrolled Participants by Randomly Assigned Group

Characteristic	Quickstart Group (n=236)	Afterstart Group (n=240)
Age (y)		
17 or younger	4 (1.7)	3 (1.3)
18–24	113 (47.9)	121 (50.4)
25 or older	119 (50.4)	116 (48.3)
Education less than 12 y*	104 (44.1)	96 (40.0)
Previous pregnancies		
0	44 (18.6)	39 (16.3)
1 or more	192 (81.4)	201 (83.8)
Previous abortions		
0	160 (67.8)	159 (66.3)
1 or more	76 (32.2)	81 (33.8)
Previous highly effective contraceptive use		
Sterilization	0	0
Implant	13 (5.5)	11 (4.6)
IUD	79 (33.5)	90 (37.5)
DMPA injection	11 (4.7)	13 (5.4)
NET-EN injection	13 (5.5)	10 (4.2)
Any of the above methods	106 (44.9)	117 (48.8)
Gestational age (d)		
49 or less	111 (47.0)	95 (39.6)
50–63	92 (39.0)	101 (42.1)
64 or greater	33 (14.0)	44 (18.3)
Importance of avoiding pregnancy in next 6 mo		
Very important	233 (98.7)	236 (98.3)
Somewhat important	2 (0.8)	1 (0.4)
Not important	1 (0.4)	3 (1.3)
Country		
United States	24 (10.2)	27 (11.3)
Mexico	212 (89.8)	213 (88.8)

IUD, intrauterine device; DMPA, depot medroxyprogesterone acetate; NET-EN, norethisterone enanthate.
Data are n (%).
* These are minimum numbers because education was assessed differently in the two countries.

Table 2. Abortion Outcomes by Group

Outcome	Quickstart Group (n=229*)	Afterstart Group (n=234†)	P‡
Treatment given after initial mifepristone and misoprostol			§
Surgery for ongoing pregnancy	2 (0.9)	2 (0.9)	
Surgery for other reason	7 (3.1)	7 (3.0)	
Additional medical treatment	12 (5.2)	17 (7.3)	
No additional treatment	208 (90.8)	208 (88.9)	
Days of bleeding‖			.028
0–7	53 (23.3)	66 (28.4)	
8–14	107 (47.1)	116 (50.0)	
15 or greater	67 (29.5)	50 (21.6)	
Missing	2	2	
Bleeding heavier than heaviest day of menses‖			.912
No	72 (31.7)	74 (31.9)	
Yes	155 (68.3)	158 (68.1)	
Missing	2	2	
Worst pain on scale of 0–10‖			.764
7 or less	103 (45.6)	117 (50.4)	
8 or greater	123 (54.4)	115 (49.6)	
Missing	3	2	
Recorded no. of clinical visits			.506
0	20 (8.7)	16 (6.8)	
1	187 (81.7)	189 (80.8)	
2 or more	22 (9.6)	29 (12.4)	

Data are n (%) unless otherwise specified.
* Excludes two participants who declined to have the implant inserted at admission and five with missing data on abortion outcomes.
† Excludes two participants who used or may have used a hormonal contraceptive within 6 days after mifepristone ingestion and four with missing data on abortion outcomes.
‡ Days of bleeding and pain were compared using Wilcoxon rank-sum tests. Heavy bleeding and clinical visits were compared using χ^2 tests.
§ See Table 3 for noninferiority comparisons for these outcomes.
‖ Percentages exclude patients with missing data.

The pregnancy rates through 6 months did not differ significantly by group (P=.28).

Of enrolled participants, significantly more in the Quickstart group than in the Afterstart group were documented to have received implants, intrauterine device, or sterilization by 31 days after enrollment (Table 5). Among the 417 (88%) with data at 6 months, use of these methods at 6 months was significantly more common in the Quickstart group than in the Afterstart group.

The proportion of Afterstart group participants who received long-acting methods within 31 days was significantly higher in Mexico than in the United States (87% compared with 67%; P<.001). However, we found no significant interaction by country in the association between group assignment and the proportion using long-acting contraceptives at 6 months (P=.71).

During the study, four participants in the Quickstart group and five in the Afterstart group reported serious adverse events. Eight of these events were

Table 3. Differences in Abortion Outcomes Between Groups

Outcome	Quickstart Group (n=229*)	Afterstart Group (n=234†)	Difference in Proportion
Surgery to complete abortion	9 (3.93)	9 (3.85)	0.08 (−3.06 to 3.25)
Any extra surgical or medical treatment to complete abortion	21 (9.17)	26 (11.11)	−1.94 (−6.68 to 2.77)
Ongoing pregnancy before extra treatment	2 (0.87)	2 (0.85)	0.02 (−1.80 to 1.85)

Data are n (%) or % (90% confidence interval).
* Excludes two participants who declined to have the implant inserted at admission and five with missing data on abortion outcomes.
† Excludes two participants who used or may have used a hormonal contraceptive within 6 days after mifepristone ingestion and four with missing data on abortion outcomes.

Table 4. Satisfaction With Group Assignment

Satisfaction	Quickstart Group (n=236)	Afterstart Group (n=240)	P*
At enrollment			
Pleased	187 (79.2)	129 (53.8)	<.001
Neutral	44 (18.6)	81 (33.8)	
Disappointed	5 (2.1)	30 (12.5)	
After abortion determined to be complete†			
Pleased	208 (90.0)	140 (60.1)	<.001
Neutral	21 (9.1)	79 (33.9)	
Disappointed	2 (0.9)	14 (6.0)	
Missing	5	7	

Data are n (%) unless otherwise specified.
* *P* values from χ^2 tests.
† Percentages exclude patients with missing data.

abortion complications (heavy bleeding with or without pain or fever); one was cholecystitis.

DISCUSSION

Our randomized trial found that insertion of an etonogestrel implant on the day of mifepristone ingestion did not appreciably increase the risk of medical abortion failure or ongoing pregnancy. It did significantly increase initiation of highly effective contraceptive methods within a month after the abortion and use of implants, intrauterine device, or sterilization at 6 months, although use of these methods was high in both study groups. The quickstart approach significantly and substantially enhanced participant satisfaction. These findings should encourage programs and clinicians to offer the quickstart approach to patients undergoing medical abortion who desire implants.

The quickstart approach did not produce a significant reduction in the incidence of repeat pregnancy in our trial. This finding likely reflects the high uptake of effective contraception in the Afterstart group, which resulted in a lower pregnancy rate in that group than anticipated. This high uptake may have been in part a trial effect, although we designed the trial procedures to minimize this problem: site staff were instructed not to make special efforts to encourage study participants to return to the clinic after the abortion because data could be collected by phone, and compensation could be provided by phone or mail. However, these efforts may not have been entirely successful. Notably, the proportion of Afterstart participants who received an implant within 1 month was significantly lower in the United States

Table 5. Postabortion Pregnancy and Contraception Use

Postabortion Pregnancy and Contraception Use	Quickstart Group (n=236)	Afterstart Group (n=240)	P*
Negative pregnancy test at 6.5 mo or greater (197 d)	183 (77.5)	176 (73.3)	.311
Pregnancy status at 6 mo†			.279
Pregnant within 6 mo	1 (0.5)	3 (1.4)	
Evidence of nonpregnancy through 6 mo	209 (98.1)	203 (97.6)	
No evidence of pregnancy through 6 mo	3 (1.4)	2 (1.0)	
Followed less than 6 mo	23	32	
Contraceptive known to have been received within 31 d			<.001
Implant	236 (100)	200 (83.3)	
IUD	0 (0)	0 (0)	
Sterilization	0 (0)	0 (0)	
DMPA	0 (0)	1 (0.4)	
NET-EN	0 (0)	1 (0.4)	
None of the long-acting methods listed above	0 (0)	38 (15.8)	
Contraceptive method in use at 6 mo†‡			.015
Implant	204 (96.2)	184 (89.8)	
IUD	0 (0)	1 (0.5)	
Sterilization	1 (0.4)	0 (0)	
DMPA	0 (0)	1 (0.5)	
NET-EN	0 (0)	2 (1.0)	
None of the long-acting methods listed above	8 (3.8)	17 (8.3)	
Pregnant at 6 mo or no information about contraceptive use	24	35	

IUD, intrauterine device; DMPA, depot medroxyprogesterone acetate; NET-EN, norethisterone enanthate.
Data are n (%) unless otherwise specified.
* *P* value for pregnancy status from exact log-rank test to compare pregnancy within 6 months. *P* values for other outcomes from χ^2 or Fisher exact tests. For contraception received and used, *P* values compare proportions who received or were using implant, IUD, or sterilization.
† Percentages exclude participants followed less than 6 months.
‡ One participant in the Quickstart group was using both implant and sterilization at 6 months.

(67%) than in Mexico (88%). Quickstart would likely have its greatest benefit in settings in which follow-up rates after medical abortion are low.

All previous data on the potential interaction between mifepristone and progestin contraceptives have come from either small case-series or cohort studies. The key strength of our study is its randomized design, which allows a comparison that is unaffected by selection bias. Less than 3% of our enrolled participants were excluded from the abortion failure analyses. Our sensitivity analysis concluded that even if three of the seven excluded participants in the Quickstart group and none of the six excluded participants in the Afterstart group had abortion failures, our resulting conclusion would not have changed.

Our trial was not masked, and thus group assignment could have influenced decisions about whether to provide extra treatment to complete the abortions. However, because the study was motivated by the concern that the contraceptive might diminish mifepristone efficacy, we expect that site clinicians would have had a greater predisposition to diagnose abortion failure and decide to complete the abortion surgically in the Quickstart group than in the Afterstart group, which would have undermined our ultimate conclusion. Moreover, we find no evidence in our data that this potential bias existed. For most participants, abortion outcome was assessed by ultrasonography, which is definitive at least for detecting ongoing pregnancy. Although our independent reviewer was able to confirm retrospectively that only 56% of the surgeries were needed, this proportion was the same in both groups. Neither the number of extra visits nor the time to surgery differed by group.

Ascertainment of repeat pregnancies was a substantial challenge in our study. Both for logistic reasons and to avoid affecting participants' behavior, we relied largely on participant reports collected by phone. Because many participants were using or had recently used contraceptive methods that alter vaginal bleeding patterns, apparent menses may not have been a valid indicator of nonpregnancy. However, approximately 75% of participants in both groups reported compliance with our instruction to perform a pregnancy test at home before the 7-month contact. Assuming that these reports were accurate and that participants who received and claimed to still be using highly effective, user-independent contraceptive methods were not pregnant, we ultimately obtained credible data about pregnancy status at 6 months for all but 11% and 15% of enrolled participants in the Quickstart and Afterstart groups, respectively. Nevertheless, missed pregnancies could have affected our results.

The pharmacologic properties and doses of progestin compounds contained in available contraceptives differ[12] as do women's patterns of use of these methods. Therefore, our findings with respect to the effect of quickstart of etonogestrel implants on both medical abortion outcomes and on subsequent pregnancy should not be generalized to other progestin-containing contraceptive methods. Information about quickstart of depot medroxyprogesterone acetate in medical abortion will be available from our ongoing parallel trial that will be completed later this year.

REFERENCES

1. Medical management of first-trimester abortion. Practice Bulletin No. 143. American College of Obstetricians and Gynecologists. Obstet Gynecol 2014;123:676–92.
2. Westhoff C, Kerns J, Morroni C, Cushman LF, Tiezzi L, Murphy PA. Quick start: novel oral contraceptive initiation method. Contraception 2002;66:141–5.
3. Brahmi D, Curtis KM. When can a woman start combined hormonal contraceptives (CHCs)? A systematic review. Contraception 2013;87:524–38.
4. Simpson J, Craik J, Melvin L. Quick starting contraception after emergency contraception: have clinical guidelines made a difference? J Fam Plann Reprod Health Care 2014;40:184–9.
5. Rickert VI, Tiezzi L, Lipshutz J, León J, Vaughan RD, Westhoff C. Depo now: preventing unintended pregnancies among adolescents and young adults. J Adolesc Health 2007; 40:22–8.
6. Bednarek PH, Creinin MD, Reeves MF, Cwiak C, Espey E, Jensen JT; Post-Aspiration IUD Randomization (PAIR) study trial group. Immediate versus delayed IUD insertion after uterine aspiration. N Engl J Med 2011;364:2208–17.
7. Okusanya BO, Oduwole O, Effa EE. Immediate postabortal insertion of intrauterine devices. The Cochrane Database Systematic Review 2014, Issue 7. Art. No.: CD001777. DOI: 10.1002/14651858.CD001777.pub4.
8. Sonalkar S, Hou M, Borgatta L. Administration of the etonogestrel contraceptive implant on the day of mifepristone for medical abortion: a pilot study. Contraception 2013;88:671–3.
9. Church E, Sengupta S, Chia KV. The contraceptive implant for long acting reversible contraception in patients undergoing first trimester medical termination of pregnancy. Sex Reprod Health Care 2010;1:105–9.
10. Barros Pereira I, Carvalho RM, Graçca LM. Intra-abortion contraception with etonogestrel subdermal implant. Eur J Obstet Gynecol Reprod Biol 2015;185:33–5.
11. Blackwelder WC. "Proving the null hypothesis" in clinical trials. Control Clin Trials 1982;3:345–53.
12. Sitruk-Ware R. New progestagens for contraceptive use. Hum Reprod Update 2006;12:169–78.