Effect of "Observed Start" versus traditional "Sunday Start" on hormonal contraceptive continuation after medical abortion

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CERTIFICATE OF APPROVAL

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ABSTRACT

Objective

The public health impact of unintended pregnancy is significant. An important strategy to help decrease the rate of unintended pregnancy is to implement measures that increase utilization and compliance with effective contraceptive methods. Combined hormonal contraception, in the form of the pill, ring or patch, is currently the most widely used form of reversible contraception for women in the U.S. However, these methods have side effects and complexities of use that frequently result in their misuse or discontinuation.

One approach to increase successful use of combined hormonal contraception is to encourage initiation of the method as soon as possible. Women who have recently undergone termination of an undesired pregnancy are in special need of effective contraception. We investigated the concept of early initiation of hormonal contraception in women who have just undergone a medical abortion. The objective of this study was to determine whether early initiation of combined hormonal contraception under direct clinical observation during the follow-up appointment following medical abortion ("Observed Start") increases continuation rates with the method compared to traditional "Sunday Start."

Methods

Women enrolled in a multicenter medical abortion trial who requested a combined hormonal contraceptive method (pill, ring, or patch) as contraception following medical abortion at up to 63 days gestational age were eligible for this planned sub-study. Women were randomized to either initiate the method under supervision of a clinician at the one-week post-medical abortion follow-up ("Observed Start") or at the first Sunday

following this visit ("Sunday Start"). All women received a sample of their chosen contraceptive method, and a prescription for 3 more cycles. Primary outcome was continuation of chosen method at 6 weeks. Secondary outcomes were effect of partner knowledge of contraceptive plan on continuation, and duration of bleeding with each initiation method.

Results

Of the 1,128 women in the primary trial, 261 subjects enrolled in this sub-study and 36/261 (13.8%) were lost to follow-up. There was no significant difference in method continuation at 6 weeks [Observed Start 108/114 (94.7%), Sunday Start 101/111 (91.0%, p=0.27]. There was no significant difference between groups in duration of bleeding or spotting, or in continuation based on partner knowledge.

Conclusion

Short-term continuation rates with hormonal contraception following medical abortion are high, and are not significantly improved by initiating the method at the time of the first follow-up visit under observation. The rates of partner knowledge of contraceptive method are also very high, and are highly correlated with being married. Bleeding and spotting duration following medical abortion is not affected by when hormonal contraception is initiated. .

BACKGROUND

Unintended Pregnancy and Contraceptive Use

The Centers for Disease Control and Prevention in 1999 declared family planning to be one of the 10 most significant U.S. public health achievements of the 20th century [1]. The American concept of family planning was revolutionized in 1960 with the introduction of the birth control pill. In the years since, many other contraceptive methods have been developed and made available including transdermal patches, vaginal rings, injections, intrauterine devices, subdermal implants, and multiple techniques for permanent female and male sterilization [2, 3].

Despite these advances in family planning, there are still large gaps in access, acceptance and utilization of effective contraceptive methods. Thus, unintended pregnancy continues to be a major public health problem [4]. An unintended pregnancy means that the woman either did not want to have children anymore (unwanted pregnancy) or wanted additional children at a later time (mistimed pregnancy) [5]. Data from the 2002 National Family Growth Survey (NFGS) shows that, 49% of the 6.4 million pregnancies in 2001 were unintended. During that year, three of ten U.S. women 15–44 years of age reported ever having had an unintended birth—12% reported an unwanted birth and 23% reported a mistimed birth [6].

The consequences of unintended pregnancy can be serious, and life or health altering. Pregnancies unwanted at the time of conception or mistimed by 2 or more years are less likely to receive early prenatal care [6]. Lack of prenatal care, along with poor birth spacing, or giving birth before or after one's childbearing prime can pose health risks for mothers and their children [7]. In addition, an unintended pregnancy can

interfere with a young woman's education, limiting her employment possibilities and her ability to support herself and her family [8]. Largely for reasons such as these, approximately half of women who become pregnant unintentionally decide to have an abortion. Of the 3.1 million unintended pregnancies in the U.S. in 2001, 44% ended in births, 42% in abortions and 14% in fetal losses. Sadly, the U.S. has one of the highest rates of unintended pregnancy in the industrialized world [4].

What explains this high level of unintended pregnancy? About half of unintended pregnancies occur among couples who were using a contraceptive method in the month the woman became pregnant [4, 9]. Among pregnancies that occur despite use of contraception, many result from failure to use a method consistently and correctly [9, 10]. Over half of U.S. women practicing contraception use a method that requires ongoing attention (as opposed to long-term methods that do not depend upon the user such as intrauterine devices or implants) [6]. Practicing the prevention of pregnancy, therefore, is at least as difficult as other preventive health strategies such as maintaining a proper diet, exercising and quitting smoking.

To succeed in having the number of children a woman wants when she wants them, a woman must use contraceptive methods properly for a long time – the fewer the desired number of children, the longer the period of time. For example, if a woman becomes sexually active at age 20, remains sexually active through her reproductive years (roughly until age 45) and wants only two children, she must practice contraception for approximately 240 months, or 20 years. Because of the enormous effort involved in practicing contraception continuously and effectively for more than two decades, almost half of all American women will have had at least one abortion by the time they are 45

[6]. In this light, perhaps what is surprising is how many women manage to use birth control well.

Combined Hormonal Contraception

Combined oral contraceptives (OCs) are the most widely used form of reversible contraception in the United States [6, 11]. As many as 30% of reproductive age women, including 47% of sexually active teenagers, in the United States use OCs [12]. Eighty percent of all US women will use OCs at some time during their reproductive years [12]. The most common OCs contain between 20 and 35 mcg ethinyl estradiol with varying types and doses of progestins. Generally, they are prescribed with a 28-day cycle in which a woman takes 21 days of active hormonal pills, followed by 7 days of inactive or "placebo" pills. It is expected that a woman will have a withdrawal bleed during this placebo week [2].

Women interested in using combined hormonal contraception not only have the option to choose the pill form, but also a vaginal ring (Nuva Ring®) and a transdermal patch (Ortho Evra®). The vaginal ring releases 15mcg ethinyl estradiol and 0.120 mg etonogestrel per day that is absorbed through the vaginal mucosa. It is intended to be used for a 28-day cycle consisting of 3 weeks of continuous ring use and a 1-week ring-free period. The transdermal patch releases 20mcg ethinyl estradiol and 150mcg norelgestromin daily, and also is meant to be used in a 28-day cycle. The patch is applied to the abdomen, buttocks, upper outer arm, or upper torso once a week for 3 weeks on the same day of the week, with the fourth week patch-free [3].

The pill, ring and patch all have similar side effect profiles and medical contraindications because they all exert their effects systemically through the primary

mechanism of ovulation suppression [3, 13]. In addition, there are well proven non-contraceptive benefits of using all of these methods of combined hormonal contraception. These include decreased discomfort from menstrual cramps; decreased bleeding with menses; and lower rates of pelvic inflammatory disease, cancers of the ovary and endometrium, recurrent ovarian cysts, benign breast cysts and fibroadenomas [14].

Despite the proven efficacy of combined hormonal contraception to prevent pregnancy, its safety, and its non-contraceptive benefits, patient correct and ongoing use remains suboptimal. Methods that depend on consistent and correct use by patients have a wide range of effectiveness [13, 15]. Misuse of combined OCs and method discontinuation are estimated to account for 20% of the approximately three million unintended pregnancies that occur in the United States annually [16]. It was hoped that the weekly patch and monthly vaginal ring would have higher compliance rates than the daily pill. However, similar problems with misuse have been found to apply to these methods as well [13].

Potential problems with correct use are numerous, including confusion regarding starting instructions, missing pills, taking pills out of order, starting a package early or late, and discontinuation of the method and failing to replace it with another. It is estimated that as many as 40-60% of women will discontinue the pill within a year, most often within 6 months of starting the method [11]. Data collected by the 2002 NFGS report showed that 65% of women who discontinued the pill reported “side effects” as the major reason. The next most commonly cited reasons for pill discontinuation were ‘‘worried [she] might have side effects’’ (13%) and ‘‘did not like changes to menstrual cycle’’ (13%) [6]. Other studies corroborate that unscheduled bleeding is the most

common reason for prematurely discontinuing OCs by women who desire to prevent pregnancy [17].

Most studies of hormonal contraception focus on the high discontinuation rates, but there has been less attention to data showing that up to 25% of women with a prescription for OCs will not even begin taking them [18, 19]. This may be related to ways in which women are instructed to begin hormonal contraception.

Traditional Initiation Approach

Traditional approaches to the initiation of hormonal contraception require waiting for the next menstrual period to begin the method. The rationale for this approach was to avoid giving contraceptive hormones to a woman who might have already conceived to avoid fetal exposure. We now know that inadvertent exposure to hormonal contraceptives in early pregnancy is not associated with fetal abnormalities [20]. Another motivation for the traditional starting instructions was to cause the first withdrawal bleed while using the hormonal contraception to appear about four weeks after the spontaneous menses, thus creating the appearance of a regular cycle and possibly less breakthrough bleeding [21]. We now know that unscheduled bleeding can be common during the first few months after initiating hormonal contraception, regardless of when in the cycle it is initiated [22-24].

In addition, logistical barriers can result from the traditional initiation approach. First, it delays the onset of contraceptive protection, thus increasing risk for an unintended pregnancy, especially for those women who do not have a regular menstrual cycle. Second, women may not start the method at the correct time because of temporary waning of motivation or because of confusion about the starting instructions.

Failure to begin any medication after receiving a prescription is widespread [25], and hormonal contraception is subject to similar compliance issues [26]. Worse yet, instructions for when and how to start hormonal contraception are more complicated than for the other medications. Rickert and colleagues showed that many patients seeking oral contraceptives are unable to recall pill-taking instructions at the end of the same clinic visit [27].

New Initiation Approach: "Quick Start"

One approach to increase successful use of hormonal contraception is to encourage initiation of hormonal contraception as soon as possible, regardless of the patient's menstrual cycle day. Westhoff and colleagues at Columbia University first described this initiation technique with OCs that they call "Quick Start" [28]. Here, the woman swallows her first pill in the clinic immediately after deciding to begin, and continues taking the pill daily from that day forward. No complicated counseling about when to begin is needed.

This method of product initiation was evaluated in a prospective, observational cohort study of women presenting to the Family Planning Clinics of the Columbia Presbyterian Medical Center in New York City requesting to start combined OCs. In this study, women who swallowed the first pill in the clinic were more likely to continue the method until the second package than women who planned to start the OC later (adjusted OR 2.8, 95% CI: 1.1-7.3) [28]. Similar studies have been performed for "Quick Start" of contraception with depomedroxyprogesterone acetate injection [29], the contraceptive ring [30], and the contraceptive patch [31].

Contraception After Abortion

A woman who has an abortion signals a very clear wish not to be pregnant. After an unintended pregnancy, a woman is highly motivated to prevent a recurrence. In approximately 50% of women, ovulation occurs within 2-3 weeks after first trimester pregnancy termination [32]. Therefore, contraceptive counseling and provision is considered to be an essential component to any visit for pregnancy termination. In addition, immediate provision of contraception eliminates the need for an additional visit to select a contraceptive, and may improve the likelihood of effective contraceptive use by the time ovulation resumes [11, 14, 32].

Contraception After Medical Abortion

Medical abortion does not always have an end that is as clearly defined as with surgical abortion. Women undergoing medical abortion in the first trimester (up to 63 days gestation) take two medications. Mifepristone (RU-486) is taken on the first day to begin the process. Then, 24-48 hours later, misoprostol is taken either vaginally (tablets placed in the vagina for absorption through the vaginal mucosa) or buccally (tablets placed between gums and cheeks for absorption through the mucous membranes in the mouth) to help the uterus expel the pregnancy tissue. Generally, the pregnancy is passed within 24 hours after taking the misoprostol. However, spotting and bleeding can continue for several weeks after taking the misoprostol. To be sure that the abortion is complete, women are asked to return for an ultrasound one to two weeks after taking the first medication (mifepristone).

Given the several week process for medical abortion, women may be instructed to initiate contraceptive use at varying time points. Extrapolating from the Quick Start data

that was collected in non-abortion patients, some providers have begun recommending the initiation of hormonal contraceptives on the day the first medication is given (mifepristone), the day the second medication is given (misoprostol), the Sunday following the second medication, or the same day that the medical abortion is confirmed to be complete (at the follow-up visit 1-2 weeks after the first medication) [33]. However, many clinics still recommend the more traditional approach – waiting until the next Sunday or even the next period before beginning hormonal contraception [33].

STUDY RATIONALE

To date, no data is available to understand what method of starting combined hormonal contraception after a medical abortion is optimal. Therefore, this study investigated the concept of early initiation under direct clinical observation of patients choosing a combined hormonal contraceptive method after medical abortion in a randomized trial of patients who have completed a medical abortion.

We conducted a randomized controlled trial of women already enrolled in a multicenter, medical abortion trial. We evaluated the continuation of combined hormonal contraception (combined OCs, vaginal ring or patch) in patients who received an "Observed Start" (clinical observation of starting their chosen method at the 1-week follow up visit) or "Sunday Start" (first Sunday following confirmation of expulsion at the 1-week follow-up visit).

Additionally, the patient's report that her sexual partner knew about the planned OC use was another factor that was strongly associated with short-term continuation in the first Quick Start study by Westhoff et al [28]. Other variables that attempted to

measure the stability of the relationship and communication between the partners were also associated with OC continuation; however, all of these variables were highly correlated with partner knowledge. Because partner knowledge was the simplest and most objective of these measures, we included this in our study as a measure of relationship communication and stability. Of note, Rosenberg et al. report that women with an unplanned pregnancy may be more likely to be influenced by their partner regarding contraceptive use than women with planned pregnancies [11].

Lastly, a randomized controlled trial by Westhoff et al. demonstrated that bleeding patterns are no different in women starting OCs at the time of the initial clinic visit from those who wait until the Sunday of their next menses to start their oral contraceptive [22]. Similar bleeding patterns have been reported after Quick Start of the contraceptive ring as well [24]. If bleeding patterns were different between initiation groups, this would be an important side effect that could alter continuation rates. Therefore, we collected information about bleeding and spotting patterns following the medical abortion to evaluate any differences that may exist between Observed Start and Sunday Start of combined hormonal contraception following medical abortion.

STUDY OBJECTIVES

The primary objective of this study was to determine whether early initiation of combined hormonal contraception (pill, patch or ring) under observation during the follow-up appointment following medical abortion (Observed Start) increases continuation rates of the method into the second month compared to traditional Sunday Start. The secondary objectives were to evaluate the effect of partner knowledge of the

contraceptive plan on continuation, and duration of bleeding and spotting with each initiation method.

HYPOTHESES

1) Short-term continuation of combined hormonal contraceptive methods in women who have undergone medical abortion will be higher in the Observed Start group compared to the Sunday Start group.
2) Short-term continuation of combined hormonal contraceptive methods in this population will be higher among women whose partners are aware of their contraceptive method.
3) Bleeding and spotting patterns following medical abortion will not be significantly different between the Observed Start and the Sunday Start groups.

METHODS

This was a planned substudy as part of an open-label, prospective, randomized multicenter trial in women already enrolled in a trial comparing mifepristone and misoprostol administered simultaneously versus 24 hours apart for abortion. The main medical abortion study was designed to compare the efficacy, side effects, and acceptability of misoprostol 800 mcg vaginally administered simultaneously with or 24 hours after mifepristone 200 mg in women up to 63 days gestation [34]. The study was conducted between April 2004 and May 2006 at four medical centers in the United States: University of Pittsburgh, Oregon Health and Science University, Northwestern

University and University of Southern California. The study was reviewed and approved by the Institutional Review Boards of the respective institutions. All participants were informed and provided written consent prior to participation in the study.

Selection of Subjects

Patients were offered enrollment in this sub-study at all four study sites who chose to start a combined hormonal method of contraception (OCs, patch, ring) after their medical abortion, and who had no contraindications to combined hormonal contraception use according to the World Health Organization's *Medical Eligibility Criteria for Contraceptive Use* [35]. Subjects were required to have an ultrasound examination confirming complete pregnancy expulsion. Any woman that had a pregnancy sac on ultrasound at the first follow-up visit (indicating that the medical abortion was not yet completed) was excluded from this study.

Study Procedures

After enrollment, subjects were randomized to an Observed Start or a Sunday Start. Women assigned to start their contraception under Observed Start took their first pill, applied their first patch, or placed the ring in the clinic during their first medical abortion follow up visit that confirmed complete pregnancy expulsion. Those in the Sunday Start group were instructed to begin their chosen method the first Sunday following this visit. All subjects received a sample of their chosen contraceptive method, and a prescription for 3 more cycles. Group assignment was performed in a randomized fashion using sequentially numbered opaque envelopes containing a card with computer generated assignment information. Randomization was stratified by center with equal frequency to the two treatment arms using random block sizes.

Women enrolled in the study were called by phone six weeks after their medical abortion to record whether they were continuing to use their chosen method, using another method, or not using contraception. Additionally, they were asked if their partner was aware of their contraceptive method following the abortion.

On the first day of the medical abortion, each participant received a bleeding diary with standardized definitions of bleeding, spotting, and no-flow days. Bleeding was defined as loss of blood requiring use of a sanitary pad or tampon; spotting was defined as loss of blood requiring use of a panty liner or no protection; and no-flow was defined as neither bleeding nor spotting [36]. Participants recorded the occurrence of bleeding, spotting, and no-flow days daily; beginning the day they took the first medications for the medical abortion until their bleeding resolved.

Statistical Analyses

All analyses were completed using SPSS (version 15.0; SPSS Inc, Chicago, IL). Baseline demographic data was compared according to treatment group to assess for significant differences using Fisher's exact test or Chi-square test for categorical data, and Student t-test for continuous data.

The primary outcome of the study was short-term continuation into the second month of combined hormonal contraceptive use. The primary comparison for this outcome was the difference in 6-week continuation rates between Observed Start and traditional Sunday Start groups, and was evaluated by a chi-square analysis.

Secondary outcomes included: partner knowledge of planned method of contraceptive use and duration of vaginal bleeding patterns as measured by bleeding diaries. Partner knowledge of planned contraceptive method has only two possible

responses (yes/no) and resulted in small cell sizes, so was analyzed using Fisher's exact test. Length of bleeding and spotting during the course of the study was compared between groups using the Mann-Whitney U test since these data did not appear to be normally distributed. See Figures 1 and 2.

Potential confounding variables were assessed individually in univariate logistic regression analyses. Variables with an associated p-value ≤ 0.10 were included along with other variables that were considered clinically significant based on previously published data. A forward stepwise selection procedure was used to build multivariable logistic regression models. The final logistic regression model was selected based on clinical and statistical relevance.

RESULTS

Baseline Measures

The main medical abortion trial enrolled a total of 1,128 subjects. Of these, 982 (87.1%) attended the first follow-up visit and had a confirmed completed medical abortion by ultrasound, and were thus eligible for enrollment in this sub-study. The number of women who chose combined hormonal contraception but declined participation, or who had medical contraindications to combined hormonal contraception was not recorded. A total of 261 (26.6%) subjects were enrolled in this contraceptive study, and random assignment yielded 131 women in the Observed Start group and 130 in the Sunday Start group. There was a 13.6% loss to follow-up, so 225 subjects completed the 6-week follow-up and thus had data for analysis. The proportion who completed the follow-up was similar between groups, 87.0% (n=114) for the Observed

Start group and 85.4% (n=111) for the Sunday Start group. See Figure 1 for flow of study participants.

Table 1 compares baseline demographic characteristics of the two randomized groups. The population was, on average, 25.5 years old. The majority had prior pregnancies. The majority was white (approximately 70%), with approximately 25% black and 10% Hispanic participants. Participants were balanced among education, income and tobacco use levels. In addition, gravity (number of previous pregnancies), parity (number of previous deliveries), marital status, cohabitation with partner, education status, income and main study randomization group were also balanced between groups.

Table 2 shows that previous contraceptive use was ***not*** balanced between groups. Fifty-seven subjects were not using contraception during the three months prior to their medical abortion. Of the 168 subjects who ***were*** using contraception, 36% were using condoms, 24.0% OCs, 4% patch, 2.2% ring. Since so few subjects had previous experience with the patch and ring, these were combined with OCs to be evaluated as previous hormonal contraceptive use. When compared between groups, more subjects in the Sunday Start group had previously used condoms (45% versus 27.2%; p=0.006) and more subjects in the Observed Start group had previously used hormonal contraception (39.5% versus 20.7%; p=0.002).

Of those subjects using contraception, 76 (33.8%) felt that they were using their contraceptive method correctly, and 92 (40.9%) reported that they were not using their contraceptive method correctly. This was not significantly different between study

groups; with 41 (46.1%) of the Observed Start group and 48 (53.9%) of the Sunday Start group reporting correct usage of their previous contraceptive method (p=0.88).

Outcome Measures

There was no significant difference between groups in the primary outcome: contraceptive method continuation at six weeks. Continuation was 94% (108/114) for the Observed Start group, and 91% (101/111) for the Sunday Start group (p=0.27). The sample size of 225 had 80% power to detect a 15% difference in continuation. In addition, there was no significant difference in continuation based on partner knowledge of the contraceptive method. The vast majority of subjects reported that their partner was aware of their chosen contraceptive method, 91.8% for the Observed Start and 93.6% for the Sunday start group (p=0.80).

Bleeding duration was not different between groups, lasting a median of 13 days for the Observed Start group and 14 days for the Sunday Start group (p=0.49). Likewise, spotting duration was not different between groups, lasting a median of 16 days for the Observed Start group and 17 days for the Sunday Start group (p=0.54). There was a single outlier above 80 days in both the Observed and Sunday Start groups. Reanalysis after removing this outlier did not affect the difference between groups, so it was not removed in the final analysis. See Figures 2 and 3. In addition, bleeding and spotting days were categorized to events before and after 20 days – when one might expect a withdrawal bleed after beginning hormonal contraception. This evaluation showed no difference between groups as well. Only 14.0% Observed Start and 17.1% Sunday Start subjects reported bleeding that continued more than 20 days after the medical abortion (p=0.58). More subjects overall reported continued spotting, with 32.5% Observed Start

and 30.6% Sunday Start subjects reporting spotting that continued beyond 20 days after the medical abortion (p=0.78).

In univariate logistic regression analysis, gravity, parity, age, Hispanic ethnicity, income, education level, tobacco use, cohabitation with partner, and main study randomization group were not associated with 6-week contraceptive continuation. Crude odds ratios (ORs) from univariate analyses are presented in Tables 3 and 4. Marital status was the only variable that was statistically associated with continuation to a level of $p<0.05$ (p=0.008, OR 4.82, 95% CI: 1.51-15.42). Being married was predictive of continuing combined hormonal contraception at 6 weeks. The use of combined hormonal contraception during the previous 3 months was the next closest in statistical significance (p=0.13, OR 3.32, 95% CI: 0.71-14.63).

The multivariable logistic regression model was developed based on clinical and statistical relevance. Marital status was highly correlated with partner knowledge of the contraceptive plan in that all married subjects reported that their partner was aware of their contraceptive method. Since marital status was statistically a stronger predictor of continuation, partner knowledge was removed from the final model.

The final model included study initiation group, marital status, previous hormonal contraceptive use, and whether subjects felt they were correctly using their previous contraceptive method. Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) of the final model are presented in Table 5. In this final model, only marital status showed statistical significance, but with a very wide confidence interval (p=0.014; 95% CI: 1.51-37.12). Although not statistically significant, previous combined hormonal contraceptive use and acknowledgement of incorrect use of previous contraception

clinically are important issues that are used to guide counseling for future contraceptive methods. Therefore, these two variables were left in the final model. The adjustments with the final model slightly strengthened the association between initiation group and continuation, but it was still not statistically significant (p=0.19, AOR 2.71, 95% CI: 0.62-11.97).

DISCUSSION

Study Conclusions

This study investigated whether a technique shown to increase short-term hormonal contraception continuation rates among women attending family planning clinics would have a similar effect following medical abortion. It is especially important to address contraceptive needs in this population, as they have already had an unintended pregnancy. Our results show that short-term hormonal contraception continuation rates following medical abortion are high when the method is provided. Continuation is not improved by observed initiation at the time of the first follow-up visit. Women who have already had an unintended pregnancy are highly motivated to prevent a recurrence. The 6-week continuation rates in our study were approximately 10-15% higher (74-88% vs. 91-94%) than the continuation rates reported by Westhoff, et al.[28] in their population who had not recently undergone an abortion.

In addition, approximately 70% of subjects reported that their partner was aware of their planned contraceptive method in Westhoff's initial Quick Start study. The effect of partner knowledge on contraceptive continuation (adjusted OR 3.9, 95% CI: 1.9-8.3) was slightly higher than the effect of initiation timing (adjusted OR 2.8, 95% CI: 1.1-7.3)

[28]. In our subjects, the rate of partner knowledge of the contraceptive choice was significantly higher (92.7%). Also, all married subjects reported that their partners were aware of their planned contraceptive plan. Marital status was included in the final model because it was a stronger predictor of continuation. However, the 95% confidence interval was quite large. This likely reflects the effect of small cell size, given that there were only five subjects who were married and were not continuing their contraceptive method at 6 weeks.

Previous use of hormonal contraception and reported correct usage of contraception during the 3 months prior to medical abortion were also somewhat predictive of continuation. These variables did not show statistical significance in our study, however adjusting for these variables in multivariable logistic regression slightly strengthened the effect on continuation of early initiation with Observed Start (AOR 2.71, 95% CI: 0.62-11.97, p=0.19). Bleeding and spotting duration following medical abortion was not affected by when hormonal contraception was initiated. Had there been significant differences, this side effect could have influenced continuation. Since there is no difference between groups, we can conclude that this side effect is not likely to impact continuation in either a positive or negative way.

Strengths and Limitations

This study has several strengths. It was a randomized controlled trial with prospective data collection. The study also had low loss to follow-up, and a relatively diverse population with four separate U.S. sites. It is also the first study to focus on how best to provide hormonal contraception to women following medical abortion. The study

also provides reassuring prospective data on how initiation of hormonal contraception fails to impact bleeding patterns following medical abortion.

This study also has several limitations. The rate of continuation was much higher in our study than previously reported. The sample size had 80% power to detect a 15% difference in continuation. The difference seen in continuation until the second cycle published by Westhoff et al. was 14% (88% with immediate initiation vs. 74% with conventional start) [28].Our data suggests that women who have already had an unintended pregnancy are highly motivated to prevent a recurrence. There is a very high short-term continuation rate of combined hormonal contraception following medical abortion, regardless of initiation timing. It is possible that results with Quick Start following medical abortion might differ in a population with a higher overall level of discontinuation.

A significantly larger study would be necessary to understand why the 6-9% of subjects did not continue their contraceptive method into the second month. Most of these subjects reported switching to a less effective method such as condoms or withdrawal. Several non-continuers also reported abstinence as their contraceptive method because they did not have a current partner. This method, too, is likely to be less effective unless they initiate another contraceptive method prior to acquiring a new sexual partner.

Similarly, the rate of partner awareness of the contraceptive method was also much higher than previously reported (92.7% in our study vs. 70% in Westhoff's first Quick Start study) [28]. Therefore, our data is limited in evaluating the potential influence of this variable on continuation in our population given the low event rate of

partners not knowing about the contraceptive plan. As a measure of communication in the relationship, it is encouraging to see this high rate of partner awareness among couples who have recently had an unintended pregnancy.

Also of note, the randomization process was not successful in balancing previous contraceptive use. This is an important potential confounder, but when adjusted specifically for previous hormonal contraceptive use or condoms use, continuation did not change.

The majority of subjects were not using any contraception prior to their unintended pregnancy, and most of those that were using contraception felt they were not using it correctly. This highlights an important target area – not only access to contraception, but also correct utilization on a long-term basis. Our data does not allow speculation as to whether continuation rate beyond 6 weeks following medical abortion is affected by start date. Interestingly, a recent large randomized trial by Westhoff et al. showed no difference in OC continuation at 3 and 6 months between observed and conventional initiation methods in their family planning population (who have not recently undergone abortion) [37].

Of note, we provided every subject with one cycle of her chosen contraceptive method. Therefore, all subjects had the method physically in their hands and available at the time they were instructed to begin, whether it was in the clinic under observation or at home the following Sunday. The majority of women in this study did fill at least one prescription for the contraceptive method. Perhaps providing more cycles in advance would improve continuation for the subjects who did not continue into the second month.

Future Research Directions

Following medical abortion, it may be the direct provision of the contraceptive method that is important, and not when the woman is instructed to start. Providing an entire year's worth of hormonal contraception immediately may be able to improve long-term continuation – potentially minimizing the chance that financial or time constraints would prevent a woman from obtaining her next pill pack, ring or patch. Advanced provision of combined hormonal contraception to cover 6 or 12 months should be better evaluated to understand if this technique could improve long-term continuation, especially in women who have already had an unintended pregnancy.

Also, future studies should investigate other potential ways to improve access, acceptance and utilization of other effective contraceptive methods. It is especially important to find ways to encourage greater use of long-acting methods that require no or minimal ongoing attention such as male and female sterilization, intrauterine devices and subdermal implants. With the exception of sterilization, these long-acting methods are significantly underutilized in the United States [10].

Avoiding unintended pregnancy is a challenge for many women throughout their lives. Some of the contraceptive failure is due to the methods themselves, but most is a result of the difficulties that couples confront in incorporating the task of contraceptive use into their everyday lives. In order to decrease the personal and societal burden of unintended pregnancy, comprehensive efforts are needed on the part of policy makers, insurance organizations, clinicians, scientists and health educators to promote consistent and correct use of contraception by women at risk for unintended pregnancy, and to involve male partners in family planning as well.

Table 1. Baseline demographics of study population

	Observed Start (n=114)	Sunday Start (n=111)
Age (years)	26 ± 6	25 ± 5
Gravity		
1	39 (29.8%)	49 (37.4%)
2	34 (26%)	24 (18.3)
3	29 (22.1)	22 (16.8%)
4	16 (12.2%)	13 (9.9%)
≥5	13 (9.9%)	23 (17.6%)
Parity		
0	58 (50.9%)	58 (52.3%)
1	29 (25.4%)	23 (20.7%)
2	19 (16.7%)	21(18.9%)
≥3	8 (7.0%)	9 (8.9%)
Race		
White	84 (73.7%)	77 (69.4%)
Black	27 (23.7%)	28 (25.2%)
Other/none of these	3 (2.6%)	6 (5.4%)
Hispanic Ethnicity	14 (10.7%)	13 (9.9%)
Marital Status		
Single	105 (80.2%)	105 (80.2%)
Married	16 (12.2%)	12 (9.2%)
Divorced/Separated	10 (7.6%)	14 (10.7%)
Living with partner	47 (35.9%)	55 (42.0%)
Education status		
Some high school	8 (7.0%)	11 (9.9%)
High school graduate	26 (22.8%)	20 (18.0%)
Some college	51 (44.7%)	54 (48.6%)
College graduate	27 (23.7%)	22 (19.8%)
Graduate school	2 (1.8%)	4 (3.6%)
Annual income*		
<$20,000	54 (48.2%)	53 (47.7%)
$20,000 - $50,000	29 (25.9%)	34 (30.6%)
$50,000 - $70,000	13 (11.6%)	10 (9.0%)
>$70,000	16 (14.3%)	14 (12.6%)
Tobacco use	51 (44.7%)	40 (36%)
Main study group *(misoprostol at same time)*	60 (52.6%)	55 (49.5%)

Values are n (%) and mean (± standard deviation)
All p>0.05
* Two subjects declined to answer this question

Table 2. Baseline contraceptive use during the previous 3 months

	Observed Start (n=114)	**Sunday Start** (n=111)	***P***
Contraceptive method			0.048 *(overall)*
Condoms	31 (27.2%)	50 (45.0%)	0.006
Spermicide	5 (4.4%)	1 (0.9%)	0.21
Condoms & Spermicide	3 (2.6%)	2 (1.8%)	0.99
*Combined hormonal contraception**	45 (39.5%)	23 (20.7%)	0.002
*Natural methods***	4 (3.5%)	3 (2.7%)	0.99
None	25 (21.9%)	35 (44.3%)	0.36
Reported correct usage	41 (46.1%)	35 (44.3%)	0.88

Values are n (%).
All p>0.20, except as indicated.

*Combined hormonal contraception includes OCs, ring and patch. These were combined because of the low rate of previous ring and patch use.

** Natural methods include withdrawal and menstrual timing/fertility awareness.

Table 3. Baseline demographics from univariate logistic regression analysis

	Odds ratio for continuation (OR)	95% confidence interval for OR	*P*
Age	1.03	0.94-1.13	0.49
Gravity			
1	Referent	Referent	
2	1.06	0.34-3.29	0.92
≥3	0.80	0.20-3.21	0.75
Parity			
0	Referent	Referent	
1	1.11	0.33.3.79	0.86
≥2	0.81	0.17-3.81	0.79
Race			
White	Referent	Referent	
*Non-white**	1.21	0.38-3.90	0.75
Hispanic Ethnicity	1.21	0.26-5.70	0.81
Marital Status			
*Single***	Referent	Referent	
Married	4.82	1.51-15.42	0.008
Living with partner	0.78	0.28-2.18	0.64
Education status			
High school†	Referent	Referent	
Some college	0.59	0.16-2.23	0.44
College grad or beyond	0.50	0.15-1,61	0.24
Annual income			
<$20,000	Referent	Referent	
$20,000 - $50,000	0.67	0.20-2.23	0.52
>$50,000	0.48	0.11-2.11	0.33
Tobacco use	1.54	0.52-4.59	0.44
Main study group *(Misoprostol at same time)*	1.38	0.49-3.83	0.54

* Non-white includes black, Asian, Native Hawaiian/Pacific Islander, American Indian, and multiethnic

** Single includes divorced and separated.

† High school includes some high school and high school graduate.

Table 4. Other characteristics from univariate logistic regression analysis

	Odds ratio for continuation (OR)	95% confidence interval for OR	*P*
Study group (*Observed Start)*	1.78	0.63-5.08	0.28
Partner knowledge of contraceptive method	2.29	0.47-11.23	0.31
Reported correct use of contraceptive method during previous 3 months	2.00	0.50-8.03	0.33
Combined hormonal contraceptive use during previous 3 months	3.23	0.71-14.63	0.13
Condom use during previous 3 months	0.93	0.33-2.67	0.90

Table 5. Baseline characteristics associated with 6-week continuation from multivariable logistic regression analysis

	Adjusted odds ratio for continuation (AOR)	95% confidence interval for OR	*P*
Study group *(Observed Start)*	2.71	0.62-11.97	0.19
Marital status *(Married)*	7.50	1.51-37.12	0.014
Reported correct use of contraceptive method during previous 3 months	2.45	0.57-10.55	0.23
Combined hormonal contraception use during previous 3 months	2.43	0.46-12.81	0.29

Figure 1. Flow of study participants

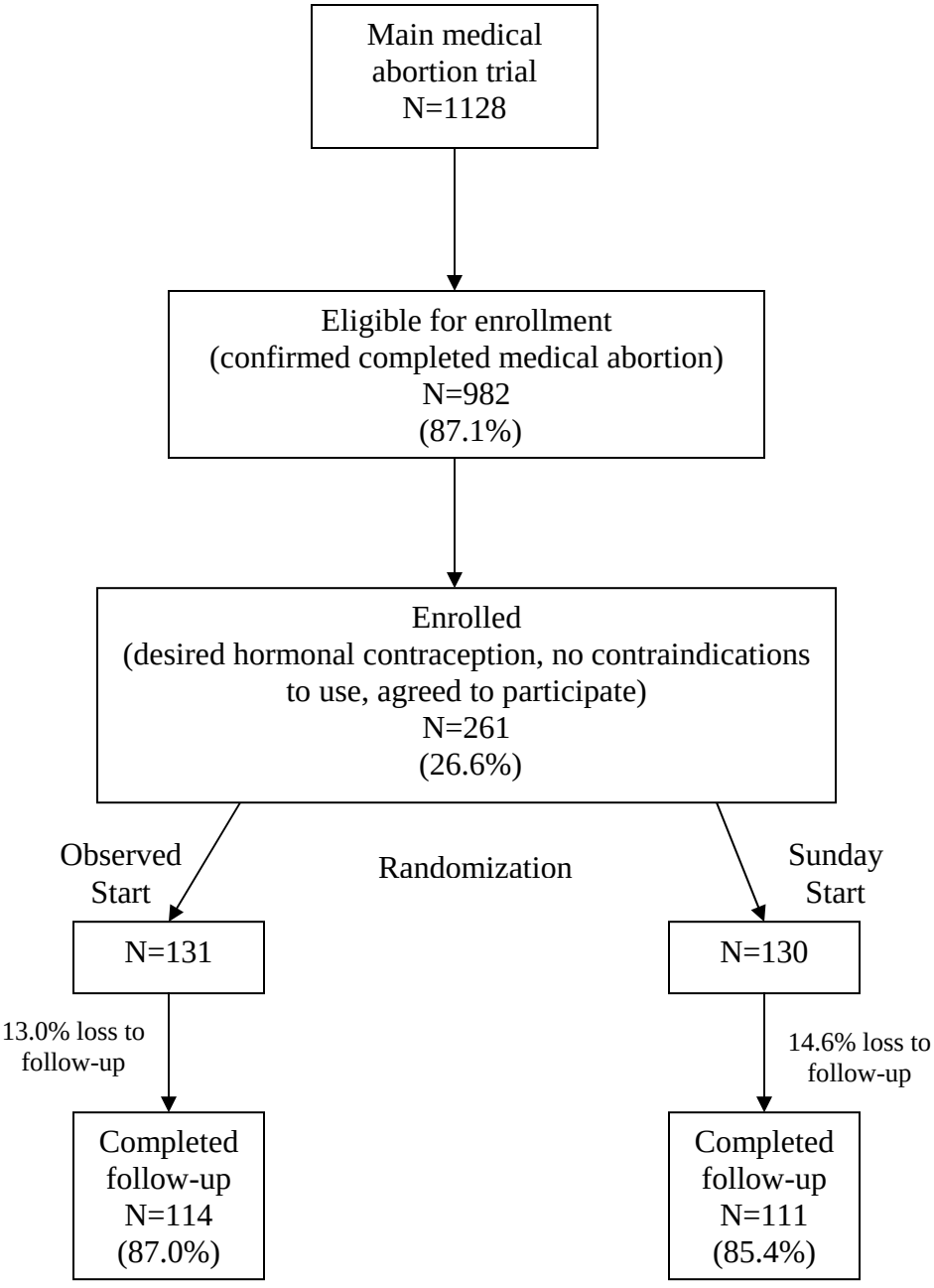


Figure 2. Bleeding patterns following medical abortion

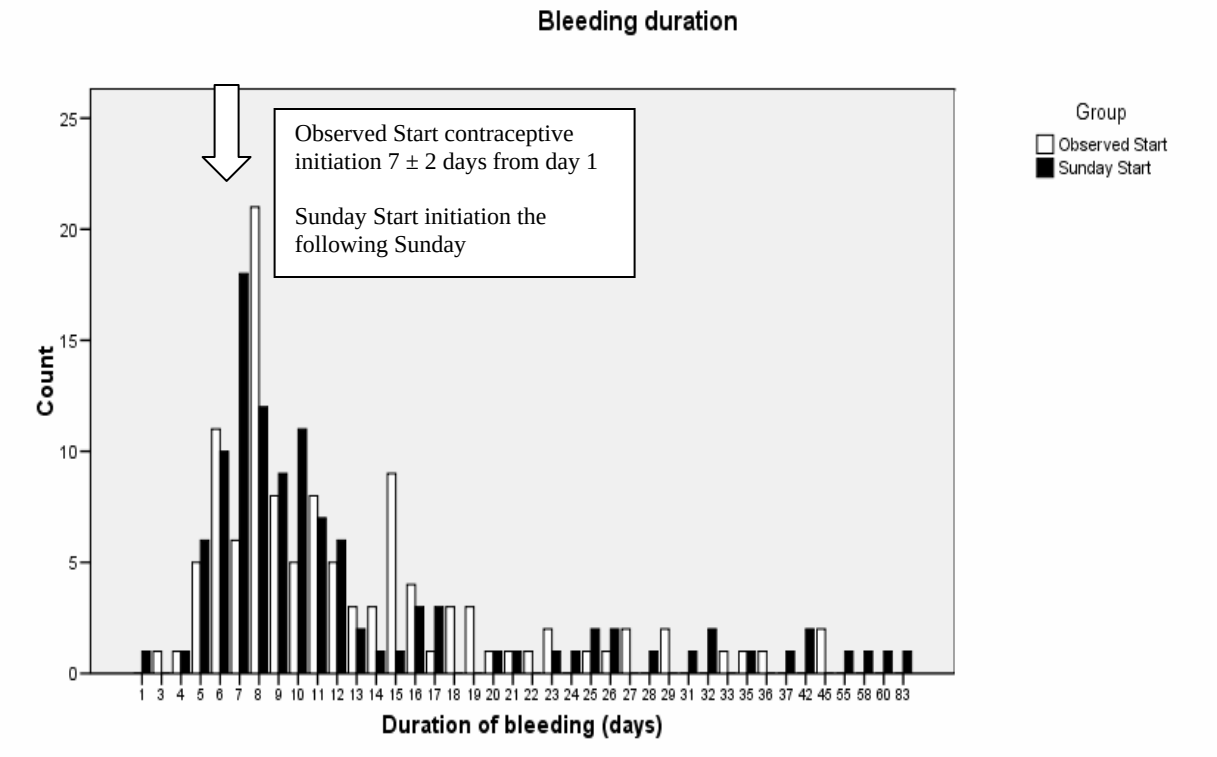
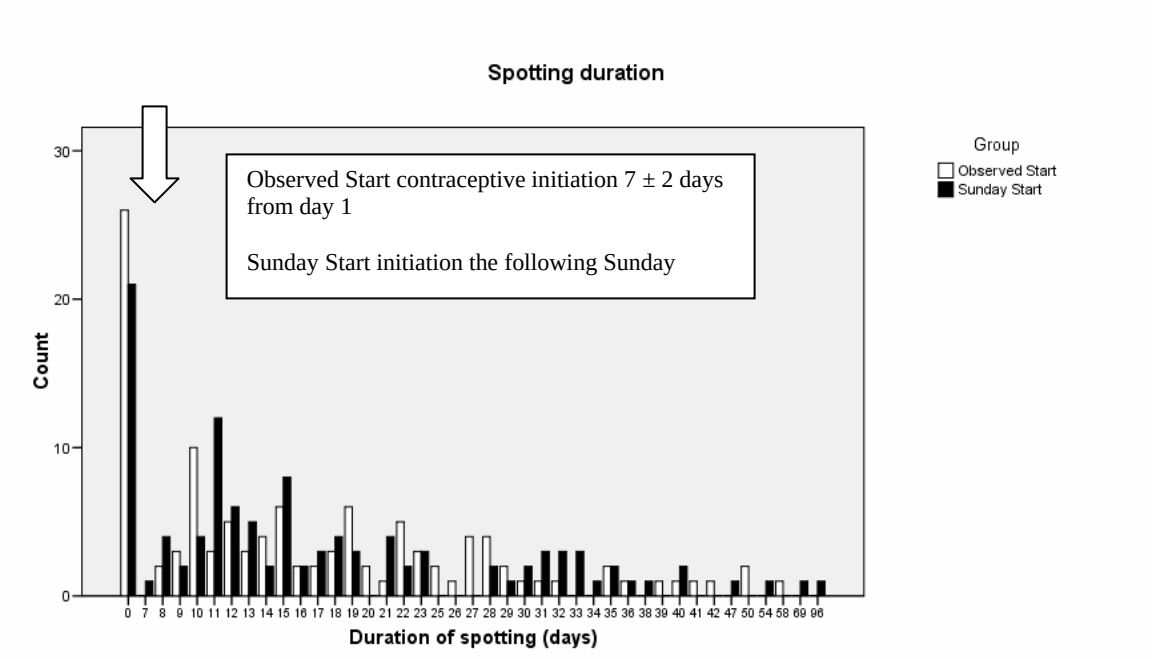


Figure 3. Spotting patterns following medical abortion



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