HHS Public Access

Author manuscript

Contraception. Author manuscript; available in PMC 2016 July 01.

Published in final edited form as:

Contraception. 2015 July ; 92(1): 26–30. doi:10.1016/j.contraception.2015.03.016.

Pharmacy claims data versus patient self-report to measure contraceptive method continuation

Jourdan E. Triebwasser, MD, MA[a], **Stephanie Higgins, BA**[a], **Gina M. Secura, PhD, MPH**[a], **Qiuhong Zhao, MS**[a], and **Jeffrey F. Peipert, MD, PhD**[a]

Jourdan E. Triebwasser: triebwasserj@wudosis.wustl.edu; Stephanie Higgins: higginss@wusm.wustl.edu; Qiuhong Zhao: zhaoq@wudosis.wustl.edu; Jeffrey F. Peipert: peipertj@wudosis.wustl.edu

[a]Washington University in St. Louis School of Medicine, Department of Obstetrics & Gynecology, Division of Clinical Research; 660 S Euclid Ave, Campus Box 8064 St. Louis, MO; 63108

Abstract

Objective—To compare self-reported 12-month continuation of oral contraceptive pills (OCPs), patch, and ring versus continuation by pharmacy claims data.

Study Design—Women in the Contraceptive CHOICE Project who chose OCPs, the patch, or ring as their initial method were included. Continuation was assessed by periodic telephone survey and by obtaining prescription claims data. Continuation was defined as no gap of more than 30 days. Kaplan-Meier survival functions were used to estimate continuation rates and cumulative unintended pregnancy rates. Kappa statistic assessed the level of agreement between self-report and claims data.

Results—We analyzed 1,510 women who initiated use by 3 months and provided information on discontinuation. Of OCP users, 59% continued their method at 12 months by self-report versus 38% by pharmacy claims. Patch and ring users had self-reported/pharmacy continuation of 45%/28%, and 57%/37%, respectively. Kappa coefficients and their 95% confidence intervals between the two measurements were 0.46 [0.40–0.52], 0.54 [0.39–0.68], and 0.54 [0.47–0.61] for OCP, patch, and ring, respectively. Among women who self-reported continuation, unintended pregnancy rates were 0.4% in those who continued by pharmacy claims versus 4.9% in those who discontinued according to claims data.

Conclusion—Contraceptive continuation rates differ by self-report versus pharmacy claims with women overestimating their continuation by self-report.

Keywords

contraceptive continuation; contraceptive patch; contraceptive ring; oral contraceptive pill; pharmacy claims

Correspondence (no reprints): Jourdan E. Triebwasser, MD, MA, Washington University in St. Louis School of Medicine, 660 S. Euclid Ave, Campus Box 8064, St. Louis Missouri 63110, Phone 314-362-1016, Fax: 314-747-1490, triebwasserj@wudosis.wustl.edu.

1. Introduction

Half of all unintended pregnancies in the United States are the result of contraceptive failure or misuse [1]. While combined hormonal contraceptives have high efficacy rates in clinical trials, failure rates with typical use are approximately 9% per year [2]. Many of these failures are related to method discontinuation [3]. Additionally, women who discontinue combined hormonal contraceptives are more likely to switch to less-effective methods of contraception, including no method, putting them at even greater increased risk of unintended pregnancy [4,5].

Although sequelae of contraceptive discontinuation are well known, current methods of assessing discontinuation patterns may be inaccurate. Most studies have relied on patient self-report, with 12-month continuation rates ranging from 53–67% for oral contraceptive pills (OCPs), and continuation rates of 42–54% and 26–49% reported for contraceptive ring and patch, respectively [5–9]. A few studies have compared self-reported measurement of OCP use to more objective measures of usage including electronic pill monitoring and blood hormone levels, but these methods are difficult to reproduce in large cohorts [10,11]. Analysis of a large US pharmaceutical database demonstrated low rates (26–29%) of uninterrupted contraceptive use for OCPs, patch, and ring at one year [12]. However, large database studies are limited by the lack of correlated clinical data. Studies have additionally been limited by lack of consistently defined terminology [7].

To further understand patterns of contraception continuation, we analyzed continuation at 12 months among Contraceptive CHOICE Project participants using OCP, patch, or ring. We compared self-reported continuation rates to pharmacy claims data. Given lower continuation rates in pharmacy claims studies compared to survey-based studies, we hypothesized that women in our study would overestimate their continuation compared to pharmacy records [5–9,12]. We further analyzed the subgroup of women who self-reported continuation and compared rates of unintended pregnancy between women whose pharmacy records indicated continuation versus those whose records indicated discontinuation.

2. Materials and Methods

The Contraceptive Choice Project (CHOICE) is a prospective cohort study that sought to decrease unintended pregnancy rates in the St. Louis region by providing no-cost reversible contraception as described previously [13]. Women in the study were 14–45 years of age, sexually active with a male partner in the past 6 months or planning to be sexually active in the next 6 months; at risk of unintended pregnancy (no permanent sterilization or hysterectomy) with no plans for pregnancy in the next 12 months; residents of the St. Louis region; and willing to start a new form of reversible contraception. Baseline demographic characteristics, reproductive history, and sexual behaviors were captured at time of enrollment. All women who enrolled received standardized contraceptive counseling on reversible contraceptive methods and baseline sexually transmitted infection (STI) testing. Follow-up telephone interviews were conducted at 3, 6, and 12 months after enrollment. The study was approved by the Washington University in St. Louis School of Medicine Human Research Protection Office and all participants provided written informed consent.

Of the 1,686 women enrolled in CHOICE who chose OCPs, patch, or ring at baseline, 1,510 women (90%) initiated use by 3 months and provided information on discontinuation. To mimic many insurance plans available in Missouri, participants were required to fill their prescriptions on a monthly basis without charge or copay at a local family planning clinic or one local grocery chain (82 locations) by presenting CHOICE ID cards. The grocery chain and the clinic sent claims data documenting the dispense date for contraceptive method refill to study staff at the end of each month.

To assess continuation from survey data, participants were asked, “Are you still using the method?” and, “Did you ever stop using the method?” The start month and year were recorded. If the participants reported stopping the method, the stop month and year were recorded, and also restart month and year if any. Continuation was defined as contraceptive use throughout the 12-month interval with no gap of use of one month or longer. It is considered a method stop if participant switched to a different contraceptive method. To measure continuation by claims data we obtained contraception start and stop dates from participants’ pharmacy records. The contraceptive start date represented the dispense date, the stop date was coded as 28 days after the dispense date. Patients were counted as continuing their contraceptive method if the gap between a stop date and subsequent start date was 30 days or less. We censored participants who were lost to follow-up at the time of their last contact.

We used ANOVA for continuous variables and χ^2 for categorical variables to compare baseline characteristics among OCP, patch, and ring users. Kaplan-Meier survival functions were used to estimate the probability of surviving the event (method discontinuation or unintended pregnancy) by certain time point, from which we calculated continuation rates and cumulative unintended pregnancy rates. We constructed 2x2 tables comparing continuation by survey versus pharmacy data and calculated Cohen’s kappa coefficient to measure the agreement between survey and pharmacy claims data on continuation status. Level of agreement by kappa statistic was based on guidelines by Landis and Koch [14]. Baseline characteristics of patients who were continuers by survey were stratified by whether or not they were also continuers by pharmacy claims data. We used Poisson regression to evaluate the relative risk of discontinuation because discontinuation was a common outcome. We used a stepwise selection process to identify factors associated with a discrepancy in continuation status among women who self-reported continuation yet their pharmacy claims data suggested discontinuation.

3. Results

Baseline characteristics of OCP, (n=769), patch (n=153), and ring (n=588) users are presented in Table 1. There were significant differences between the groups in terms of race, socioeconomic status, and past reproductive history. Patch users were significantly more likely than OCP and ring users to require public assistance ($p<0.01$) and to be uninsured ($p<0.01$). Patch users had more previous unintended pregnancies ($p<0.01$), and were significantly more likely to have had an abortion ($p<0.01$).

Continuation rates at 12 months by self-report were 59%, 45%, and 57% for OCP, patch, and ring, respectively. Using pharmacy claims, continuation rates were lower at 38%, 28%, and 37%, respectively. For all three methods, there was only moderate agreement between self-report and pharmacy claims (kappa and 95% confidence interval for OCP, patch, and ring respectively = 0.46 [0.40–0.52], 0.54 [0.39–0.68], and 0.54 [0.47–0.61]).

Table 2 shows the characteristics of participants who were continuers by self-reported survey data, stratified by whether or not they were continuers by pharmacy claims data. Reproductive and demographic characteristics associated with disagreement in continuation by self-report and pharmacy claims data include public insurance, higher parity, and history of STI. Conversely, higher educational attainment was associated with agreement in continuation status. Among women who continued their method by self-report and by pharmacy claims, the unintended pregnancy rate was 0.4%; however, those who discontinued by pharmacy claims had an unintended pregnancy rate of 4.9% ($p<0.01$).

4. Discussion

Our study suggests that women overestimate their 12-month continuation of OCP, patch, and ring increasing their risk of unintended pregnancy. Self-reported continuation rates were comparable to previous reports [5–9]. Continuation rates by pharmacy claims in this study were similar to rates of “timely refills” at 12 months as reported from a large pharmacy database study, despite the previous study using a 14-day timely refill threshold [12]. However, our study is unique in directly comparing these rates. For all three contraceptive methods, the agreement between self-reported continuation rates and pharmacy-verified continuation rates was moderate.

The differences seen between self-report and pharmacy claims are driven by several factors. Social desirability bias, which is common in studies related to contraception and family planning, may lead to inflated continuation rates by self-report [15]. Women in our study may be particularly at risk of social desirability bias as the survey was conducted by the same research group that was providing their no-cost contraception. Additionally, women may not have interpreted gaps in their contraceptive use as discontinuation. For example, a woman who does not have a current partner may temporarily suspend use of her contraception without considering that she has discontinued the method. It is also possible that women received their contraceptives at a non-study pharmacy; thus their survey data would reflect continuation while pharmacy data would not. However, we believe this was uncommon. There were many participating pharmacy locations in the area (n=82), and women would have to cover the cost of their contraceptive at non-study pharmacies.

We defined discontinuation as non-use of more than 30 days. We selected this period for several reasons. First, when women reported starting or stopping a method by survey data, only month and year were recorded. Month level pharmacy data, including a 30-day gap constituting discontinuation, could then be readily compared to survey data. Second, brief interruptions in use, which many women would not consider method discontinuation, should not have affected survey or pharmacy continuation status.

Our analysis included detailed clinical information collected from participants. This allowed us to compare differences between subpopulations of women who reported continuation and did or did not fill their prescriptions as reported. We identified certain subgroups with discrepancy between continuation status by self-report versus pharmacy claims. Specifically, having public health insurance, higher parity, and history of an STI were all associated with discrepancy in continuation status according to claims data among self-reported continuers. Having public insurance and higher parity have all previously been linked to increased risk of contraceptive discontinuation [6]. These women may have impediments to accessing their contraception on a timely basis, or lack of understanding that gaps in usage can affect contraceptive effectiveness.

A limitation of our findings is that our study reflects a selected population of women at high-risk for unintended pregnancy willing to start a new method of contraception. Women who wanted to continue their current contraception were not eligible, which may have weighted our sample population toward lower continuation rates. However, our results are generalizable to women starting a new form of contraception or who desire to change methods. Our analysis includes 21 (1.4%) women who discontinued their method to become pregnant. We included these participants because our objective was to measure agreement between continuation rates regardless of reason for discontinuation. Reason for discontinuation was purposefully not assessed as part of this study, as it had previously been reported elsewhere [5].

We found many women report refillable contraceptive continuation despite data from prescription refills that do no support continued use. This disagreement was relatively constant for women who chose OCPs, the patch, or the ring. These results suggest that previously published continuation rates obtained by participant self-report may actually overestimate contraceptive continuation, especially among certain high-risk women. These discrepant continuation rates also highlight the importance of broad education on using refillable methods effectively and offering emergency contraception routinely as many women will not have “perfect use” of their method.

Acknowledgments

Acknowledgement of financial support: The Contraceptive CHOICE Project is funded by an anonymous foundation. This publication also was supported by the Washington University Institute of Clinical and Translational Sciences grant UL1 TR000448 from the National Center for Advancing Translational Sciences. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. Dr. Peipert receives research funding from Bayer, Teva, and Merck, and serves on advisory boards for Teva Pharmaceuticals, Bayer Healthcare Pharmaceuticals, and MicroCHIPS.

References

1. Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. Perspect Sex Reprod Health. 2006; 38:90–6. [PubMed: 16772190]
2. Trussell J. Contraceptive failure in the United States. Contraception. 2011; 83:397–404. [PubMed: 21477680]
3. Rosenberg MJ, Burnhill MS, Waugh MS, Grimes DA, Hillard PJA. Compliance and oral contraceptives: a review. Contraception. 1995; 52:137–41. [PubMed: 7587184]

4. Pratt WF, Bachrach CA. What do women use when they stop using the pill? Fam Plann Perspect. 1987; 19:257–66. [PubMed: 3436413]
5. Stuart JE, Secura GM, Zhao Q, Pittman ME, Peipert JF. Factors associated with 12-month discontinuation among contraceptive pill, patch, and ring users. Obstet Gynecol. 2013; 121:330–6. [PubMed: 23344283]
6. Vaughan B, Trussell J, Kost K, Singh S, Jones R. Discontinuation and resumption of contraceptive use: results from the 2002 National Survey of Family Growth. Contraception. 2008; 78:271–83. [PubMed: 18847574]
7. Hall KS, White KO, Reame N, Westhoff C. Studying the Use of Oral Contraception: A Review of Measurement Approaches. J Womens Health. 2010; 19:2203–10.
8. Peipert JF, Zhao Q, Allsworth JE, Petrosky E, Madden T, Eisenberg D, et al. Continuation and satisfaction of reversible contraception. Obstet Gynecol. 2011; 117:1105–13. [PubMed: 21508749]
9. Lete I, Perez-Campos E, Correa M, Robledo J, de la Vida E, Martinez T, et al. Continuation Rate of Combined Hormonal Contraception: A Prospective Multicenter Study. J Womens Health. 2012; 21:490–5.
10. Jay S, Durant RH, Litt IF, Linder CW, Shoffitt T. Riboflavin, Self-Report, and Serum Norethindrone - Comparison of Their Use as Indicators of Adolescent Compliance with Oral-Contraceptives. Am J Dis Child. 1984; 138:70–3. [PubMed: 6362397]
11. Potter L, Oakley D, de Leon-Wong E, Cañamar R. Measuring compliance among oral contraceptive users. Fam Plann Perspect. 1996; 28:154–8. [PubMed: 8853280]
12. Nelson AL, Westhoff C, Schnare SM. Real-World Patterns of Prescription Refills for Branded Hormonal Contraceptives. Obstet Gynecol. 2008; 112:782–7. [PubMed: 18827120]
13. Secura GM, Allsworth JE, Madden T, Mullersman JL, Peipert JF. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. Am J Obstet Gynecol. 2010; 203:e111–7.
14. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977; 33:159–74. [PubMed: 843571]
15. Stuart GS, Grimes DA. Social desirability bias in family planning studies: a neglected problem. Contraception. 2009; 80:108–12. [PubMed: 19631784]

Implications

This article directly compares contraception continuation rates by self-report and by pharmacy claims data. The study suggests that previously reported continuation rates from survey data overestimate specific method use.

Table 1

Baseline demographic and reproductive characteristics by chosen method among women in the Contraceptive CHOICE project

Characteristics	OCP (n=769)	Patch (n=153)	Ring (n=588)	P
Age	23.8±5.2	24.2±4.6	24.4±4.5	0.12
Race				**<0.01**
Black	336 (43.7)	89 (58.2)	223 (38.0)	
White	370 (48.1)	53 (34.6)	310 (52.8)	
Others	63 (8.2)	11 (7.2)	54 (9.2)	
Education				**<0.01**
High school or less	199 (25.9)	45 (29.4)	108 (18.4)	
Some college	345 (44.9)	73 (47.7)	256 (43.5)	
College or graduate degree	225 (29.3)	35 (22.9)	224 (38.1)	
Marital Status				0.06
Single/Never married	556 (72.3)	109 (71.2)	411 (69.9)	
Married/Living with partner	183 (23.8)	32 (20.9)	158 (26.9)	
Separated/Divorced/Widowed	30 (3.9)	12 (7.8)	19 (3.2)	
Receives public assistance[a]	157 (20.4)	50 (32.9)	108 (18.4)	**<0.01**
Insurance				**<0.01**
None	336 (44.0)	83 (54.6)	221 (38.2)	
Private	382 (50.0)	56 (36.8)	334 (57.7)	
Public	46 (6.0)	13 (8.6)	24 (4.1)	
Gravidity				**<0.01**
0	403 (52.4)	53 (34.6)	303 (51.5)	
1	168 (21.8)	46 (30.1)	126 (21.4)	
2	109 (14.2)	19 (12.4)	70 (11.9)	
3 or higher	89 (11.6)	35 (22.9)	89 (15.1)	
Parity				**<0.01**
0	570 (74.1)	88 (57.5)	415 (70.6)	
1	120 (15.6)	39 (25.5)	107 (18.2)	
2	57 (7.4)	16 (10.5)	44 (7.5)	
3 or higher	22 (2.9)	10 (6.5)	22 (3.7)	
No. of unintended pregnancies				**<0.01**
0	433 (56.5)	58 (37.9)	320 (54.4)	
1	189 (24.7)	51 (33.3)	145 (24.7)	
2	86 (11.2)	18 (11.8)	64 (10.9)	
3 or higher	58 (7.6)	26 (17.0)	59 (10.0)	
History of abortion	221 (28.7)	65 (42.5)	168 (28.6)	**<0.01**
History of STI[b]	222 (28.9)	66 (43.1)	226 (38.4)	**<0.01**
STI at baseline[c]	51 (7.1)	12 (8.4)	24 (4.3)	0.05

OCP, oral contraceptive pill; STI, sexually transmitted infection.

Data are mean±standard deviation or n (%).

[a]"Self-reported current receipt of food stamps; vouchers from the supplementary nutritional program for women, infants, and children (WIC); welfare; or unemployment benefits.

[b]Reported a history of *Chlamydia trachomatis*, *Neisseria gonorrhea*, *Trichomonas vaginalis*, syphilis, herpes, or human immunodeficiency virus at study enrollment

[c]Tested positive for *C. trachomatis*, *N. gonorrhea*, or *T. vaginalis* at study enrollment.

All values in bold are statistically significant at $p<0.05$.

Table 2

Characteristics associated with discrepancy in continuation status among those who self-reported continuing their baseline method at 12 months

	Continuer by Pharmacy Data	Discontinuation by Pharmacy Claims		
Characteristics	**Yes (n=514)**	**No (n=363)**	**Relative Risk (95% CI)**	**Adjusted Relative Risk (95% CI)**
Age	24.4±4.6	24.3±5.2	1.00 (0.98, 1.01)	-
Race				
Black	180 (35.0)	177 (48.8)	**1.39 (1.18, 1.63)**	-
White	294 (57.2)	163 (44.9)	reference	-
Others	40 (7.8)	23 (6.3)	1.02 (0.72, 1.45)	-
Education				
High school or less	91 (17.7)	96 (26.4)	reference	-
Some college	223 (43.4)	173 (47.7)	0.85 (0.71, 1.02)	0.93(0.77, 1.12)
College or graduate degree	200 (38.9)	94 (25.9)	**0.62 (0.50, 0.77)**	**0.72(0.56, 0.91)**
Marital Status				
Single/Never married	342 (66.5)	260 (71.6)	reference	-
Married/Living with partner	155 (30.2)	92 (25.3)	0.86 (0.72, 1.04)	-
Separated/Divorced/Widowed	17 (3.3)	11 (3.0)	0.91 (0.57, 1.46)	-
Receives public assistance[a]	68 (13.3)	98 (27.0)	**1.58 (1.35, 1.85)**	-
Insurance				
None	210 (41.3)	158 (44.3)	1.16 (0.98, 1.37)	1.00(0.84, 1.19)
Private	286 (56.2)	169 (47.3)	Reference	Reference
Public	13 (2.6)	30 (8.4)	**1.88 (1.49, 2.36)**	**1.46(1. 15, 1.86)**
Gravidity				
0	284 (55.3)	160 (44.1)	reference	-
1	114 (22.2)	79 (21.8)	1.14 (0.92, 1.40)	-
2	59 (11.5)	58 (16.0)	**1.38 (1.10, 1.72)**	-
3 or higher	57 (11.1)	66 (18.2)	**1.49 (1.21, 1.83)**	-
Parity				
0	400 (77.8)	227 (62.5)	Reference	Reference
1	71 (13.8)	81 (22.3)	**1.47 (1.23, 1.77)**	**1.26 (1.04, 1.53)**
2	31 (6.0)	36 (9.9)	**1.48 (1.16, 1.90)**	1.26 (0.96, 1.64)

	Continuer by Pharmacy Data	Discontinuation by Pharmacy Claims		
Characteristics	**Yes (n=514)**	**No (n=363)**	**Relative Risk (95% CI)**	**Adjusted Relative Risk (95% CI)**
3 or higher	12 (2.3)	19 (5.2)	**1.69 (1.26, 2.28)**	**1.43 (1.05, 1.95)**
Number of unintended pregnancies				
0	300 (58.5)	183 (50.6)	Reference	-
1	124 (24.2)	91 (25.1)	1.12 (0.92, 1.36)	-
2	49 (9.6)	45 (12.4)	1.26 (0.99, 1.61)	-
3 or higher	40 (7.8)	43 (11.9)	**1.37 (1.08, 1.73)**	-
History of abortion	149 (29.0)	116 (32.0)	1.08 (0.92, 1.28)	-
History of STI[b]	140 (27.2)	136 (37.6)	**1.31 (1.12, 1.53)**	**1.20(1.02, 1.42)**
Any current STI[c]	20 (4.1)	27 (8.0)	**1.43 (1.10, 1.85)**	-

[a]"Self-reported current receipt of food stamps; vouchers from the supplementary nutritional program for women, infants, and children (WIC); welfare; or unemployment benefits.

[b]Reported a history of *Chlamydia trachomatis*, *Neisseria gonorrhea*, *Trichomonas vaginalis*, syphilis, herpes, or human immunodeficiency virus at study enrollment

[c]Tested positive for *C. trachomatis*, *N. gonorrhea*, or *T. vaginalis* at study enrollment.