

GYNECOLOGY

Condom use and incident sexually transmitted infection after initiation of long-acting reversible contraception

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BACKGROUND: Use of more effective contraception may lead to less condom use and increased incidence of sexually transmitted infection.

OBJECTIVE: The objective of this study was to compare changes in condom use and incidence of sexually transmitted infection acquisition among new initiators of long-acting reversible contraceptives to those initiating non-long-acting reversible contraceptive methods.

STUDY DESIGN: This is a secondary analysis of the Contraceptive CHOICE Project. We included 2 sample populations of 12-month continuous contraceptive users. The first included users with complete condom data (baseline, and 3, 6, and 12 months) (long-acting reversible contraceptive users: $n = 2371$; other methods: $n = 575$). The second included users with 12-month sexually transmitted infection data (long-acting reversible contraceptive users: $n = 2102$; other methods: $n = 592$). Self-reported condom use was assessed at baseline and at 3, 6, and 12 months following enrollment. Changes in condom use and incident sexually transmitted infection rates were compared using χ^2 tests. Risk factors for sexually transmitted infection acquisition were identified using multivariable logistic regression.

RESULTS: Few participants in either group reported consistent condom use across all survey time points and with all partners (long-acting reversible contraceptive users: 5.2%; other methods: 11.3%; $P < .001$). There was no difference in change of condom use at 3, 6, and 12 months compared to baseline condom use regardless of method type ($P = .65$). A total of 94 incident sexually transmitted infections were documented, with long-acting reversible contraceptive users accounting for a higher proportion (3.9% vs 2.0%; $P = .03$). Initiation of a long-acting reversible contraceptive method was associated with increased sexually transmitted infection incidence (odds ratio, 2.0; 95% confidence ratio, 1.07–3.72).

CONCLUSION: Long-acting reversible contraceptive initiators reported lower rates of consistent condom use, but did not demonstrate a change in condom use when compared to preinitiation behaviors. Long-acting reversible contraceptive users were more likely to acquire a sexually transmitted infection in the 12 months following initiation.

Key words: long-acting reversible contraception, sexually transmitted infection

Introduction

Long-acting reversible contraceptives (LARCs) are the most effective reversible methods of pregnancy prevention,¹ however they do not provide protection against sexually transmitted infections (STIs).^{2–6} Barrier methods, such as condoms, are the most effective method for STI prevention,^{2,7} but have a typical use contraceptive failure rate of 15–17%.^{8,9} Clinicians have long recommended dual protection with an effective contraceptive method along with condom use. Poor adherence to these recommendations poses a challenge to reliable prevention of both STIs and pregnancy.^{5–7,10,11} Several studies have suggested that rates of dual-method use among LARC users is lower than among

users of other short-acting reversible methods.^{10,12–15} Available literature indicates that across women of all reproductive ages, there is low adherence to dual-method use.^{6,10} Studies evaluating factors associated with higher rates of dual-method compliance have shown age,⁵ race, and number of sexual partners,¹⁵ but not necessarily contraceptive method, to be associated¹⁶ with dual use. Most studies, however, have not specifically compared LARC to non-LARC users.

Varying risk perception,^{5,15} partner discordance in condom preference,¹⁵ intermittent or partner-specific condom use,^{5,6,13} and potential social desirability and recall bias^{2,10,12} make accurate assessment of condom use difficult. Additionally, few studies specifically evaluate the correlation between reported changes in condom use and acquisition of STIs.

The objective of this analysis was to examine the change in condom use in women initiating LARC methods vs those initiating non-LARC methods, as well as to evaluate rates of incident STI in

women initiating LARC and non-LARC methods. We hypothesized that there would be no difference in condom use behavior or incident STIs in women initiated LARC or non-LARC methods.

Materials and Methods

This is a secondary analysis of the Contraceptive CHOICE Project, a prospective cohort study in which 9256 women were offered the contraceptive method of their choice at no cost for 2–3 years. Full details of this study were previously published.¹⁷ This analysis includes 2 distinct populations of participants who chose a method and continued using that method through 12 months (Figure). To evaluate changes in condom use behaviors, we included all participants who provided complete data (baseline and 3-, 6-, and 12-month surveys) on condom use ($N = 2946$). Condom use behaviors were collected through a series of questions. Participants were first asked to identify their current number of sexual partners, and if they had multiple partners, they were asked each question as it related to the

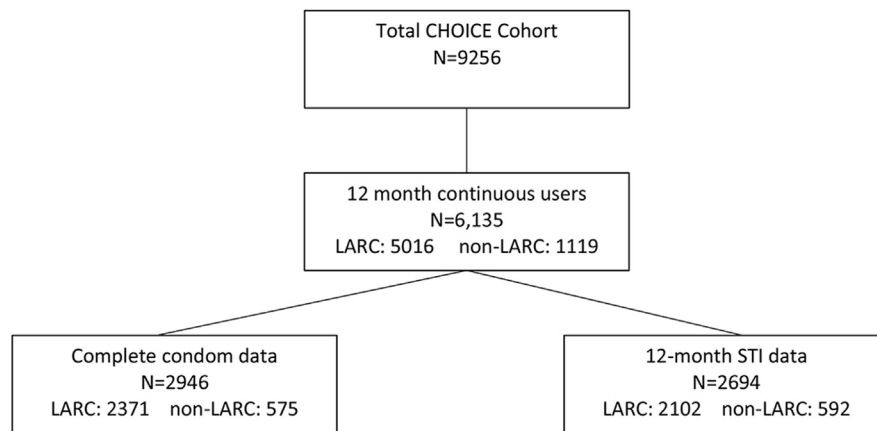
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FIGURE



Analytic population.

LARC, long-acting reversible contraceptive.

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main partner as well as their additional partner(s). Specifically, participants were asked "Since the last time we spoke, when you had vaginal or anal sex with your main (other) partner, how often did you use condoms?" Response options included every time, almost every time, sometimes, almost never, and never. The reason for condom use was also assessed by asking participants if condom use was for pregnancy prevention and/or STI prevention.

To assess the impact of method on incident acquisition, we included all participants for whom STI testing results were available during the 12-month reference period (N = 2694). The CHOICE Project provided STI screening on an annual basis as well as any time a participant requested screening secondary to perceived exposure, or if they reported symptoms of infection. In addition to any testing completed at the research center, possible diagnosis and treatment at other facilities were captured at each survey point. STIs were identified using nucleic acid amplification testing from self-collected swabs sent to each participant annually or in clinic collection. STI testing included *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Trichomonas vaginalis*. Any reported or documented positive

test was considered an incident infection.

The primary objective of this analysis is to evaluate the impact of method choice on condom use behaviors. Secondly, we compare incident STI rates between LARC and non-LARC initiators over a 12-month period. Demographic characteristics of the 2 cohorts are presented as means and SD, or frequencies and percentages based on the data type. Student *t* test or χ^2 tests were performed to examine the differences in subjects' characteristics between LARC and non-LARC users. Frequency of incident STI was calculated for LARC and non-LARC and compared using χ^2 test. Condom use behaviors with both main partner and additional partners were evaluated at baseline and 3, 6, and 12 months. If participants reported different frequency of condom use with main partner vs other partners, the least frequent response was used. Changes in condom use from baseline to follow-up time points were categorized as less frequent use, more frequent use, and no change in use. Multivariable logistic regression models were used to evaluate the association between contraceptive method (LARC vs non-LARC) and STI acquisition. Known risks factors and other clinically relevant factors were

evaluated for their association with STI acquisition and for potential confounding effect. A confounder was identified if a >10% change in the effect size was noted when the covariate was added to the model. All statistical tests were performed using software (Stata 12; StataCorp, College Station, TX). Significance levels were set at type I error <.05.

Results

Of the 9256 participants enrolled in the Contraceptive CHOICE Project, 6135 (66%) were 12-month continuous users of the method they chose at baseline. LARC users comprised 82% of this cohort (LARC: N = 5016; non-LARC: N = 1119). Of those continuous users, 2946 participants provided complete condom use behavior data (LARC: N = 2371; non-LARC: N = 575). The mean age was 26.1 years in the LARC group and 24.4 years in the non-LARC group. The cohort was racially diverse among both LARC and non-LARC initiators. Participants who chose to initiate a non-LARC method were more likely to be younger, uninsured, single, and nulliparous (Table 1). Among the 6135 continuous users, 2694 participants contributed STI results. LARC users comprised 78% of this analytic cohort (LARC: N = 2102; non-LARC: N = 592). This cohort was similar to the condom cohort. However, more LARC users reported a history of STI (LARC: 42.6% [895/2102]; non-LARC: 34.6% [205/592]; *P* < .01).

Consistent condom use, defined as use every time across all time points with all partners, was low for all participants (6.4% or 187/2946); however, non-LARC initiators were significantly more likely to report always using condoms (11.3%) as compared to LARC initiators (5.2%; *P* < .001). While there was overall less consistent condom use among LARC users, the changes in condom use patterns from time of initiation through the 12-month study period was not significantly different (Table 2). Approximately 70% of participants in both LARC and non-LARC groups reported no change in their condom use behaviors when compared to baseline.

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