Original Study

Predictors of Early Discontinuation of Effective Contraception by Teens at High Risk of Pregnancy

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A B S T R A C T

Study Objective: In the United States, teen pregnancy rates are declining. However, the United States still has the highest teen pregnancy rate among high-income countries. Understanding factors that predict discontinuation of effective contraception might help to further decrease teen pregnancy. We aimed to assess predictors of early discontinuation of effective contraception during typical use by high-risk teens.

Design, Setting, Participants, Interventions, and Main Outcome Measures: We recruited 145 women aged 13-20 years (mean, 17.7 ± 1.8 years); 68% (99/145) Hispanic; 26% (38/145) black; 14% (20/145) ever pregnant; and 4% (6/145) high school dropouts who chose an effective contraceptive method during a health care visit and we prospectively assessed use of the method after 6 months. Contraceptive choices of the 130 participants who were reassessed at 6 months (90% retention) were: intrauterine device (IUD), 26% (34/130); depot medroxyprogesterone acetate (DMPA), 8% (10/130); combined oral contraceptives (COCs), 48% (62/130); transdermal patch (Patch), 13% (17/130); and intravaginal ring (Ring), 5% (7/130).

Results: After 6 months, only 49 of 130 (38%) continued their chosen method; 28 of 130 (22%) never initiated the method; and 53 of 130 (40%) discontinued. Users and nonusers at 6 months did not differ according to cultural and/or social characteristics (age, ethnicity, acculturation, education, health literacy) but differed according to contraceptive method type. For the 102 of 130 who initiated a method, 88% continued use of the IUD, 20% DMPA, 43% COC, 17% Patch and Ring ($P < .001$). Using Cox proportional hazards multivariable analysis, compared with IUDs, all other methods predicted discontinuation: DMPA (hazard ratio [HR], 5.6; 95% confidence interval [CI], 1.2-26.7; $P < .05$); COCs (HR, 6.6; 95% CI, 1.8-25; $P < .01$); Patch and Ring (HR, 12; 95% CI, 3.0-48; $P < .001$). Discontinuation was also predicted by past use of hormonal contraceptives (HR, 1.9; 95% CI, 1.0-3.6; $P < .05$) and high school dropout (HR, 8.2; 95% CI, 1.6-41; $P < .01$).

Conclusion: Contraceptive method type is the strongest predictor of early discontinuation; compared with IUDs, all other methods are 6-12 times more likely to be discontinued. Cultural and/or social characteristics, with the exception of school dropout, are of little predictive value. Increasing the use of IUDs by high-risk teens could decrease discontinuation rates and possibly teen pregnancy rates.

Key Words: Hormonal contraceptive, Intrauterine device, Adolescent pregnancy, Contraceptive continuation

Introduction

In the United States, teen pregnancy rates have continued to decline over the past decade. However, the United States still has the highest rate of teen pregnancy among high-income countries,[1] with non-Hispanic black and Hispanic teens having twice the pregnancy rate of non-Hispanic white teens.[2] Two national studies, the National Survey of Family Growth and the Youth Risk Behavior Survey, found no significant change in the proportion of teens who were currently sexually active over the past decade.[3] Thus, the declining teen pregnancy rate is attributed to an improvement in the use of effective contraception by teens.[3–5] Researchers from the Guttmacher Institute, who used data from the National Survey of Family Growth, found that use of hormonal contraceptives by sexually active 15- to 19-year-old women in the United States increased from 37% in 2006-2008 to 47% in 2008-2010 and the use of long-acting reversible contraceptives (LARCs) by US teens tripled from 1.4% to 4.4% over the same time period.[3] However, despite their high theoretical effectiveness, short-acting hormonal contraceptives are known to be less effective in typical use,[6] in part, because of early discontinuation. In clinical samples of adolescents, 6- to 9-month continuation rates that range from 29% to 70% have been reported for hormonal contraceptives including depot medroxyprogesterone acetate (DMPA) and combination oral contraceptives (COCs).[7–10] Information on continuation rates for intrauterine devices (IUDs) in typical use by US teens is limited but 1 large study found a 12-month rate of more than 80%.[5] A better understanding of factors that predict discontinuation of effective contraception by teens at high risk of pregnancy will help in promotion of strategies to increase adherence and further decrease the teen pregnancy rate.

Minority adolescents living in areas of socioeconomic disadvantage, and from families with diverse cultural attitudes toward teenage sexuality and contraception are at high risk of unintended pregnancy. Bronx County, New

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York, the location of this study, has a population of 1.4 million and is one of the most ethnically and culturally diverse counties in the United States.[11,12] In 2011, Bronx County reported 98.6 pregnancies per 1000 women aged 15-19 years, compared with national rates of 57.4 pregnancies per 1000 15- to 19-year-old women.[13,14] Thus, the Bronx teen pregnancy rate is more than 70% higher than the national rate. However, sexual activity rates for teens in Bronx County are not higher than national rates.[15,16] Findings from the 2011 Youth Risk Behavior Survey indicate that girls who reside in Bronx County reported a significantly lower rate of use of hormonal contraceptives or LARCs at their last sexual intercourse compared with high school girls nationwide: 19% vs 30%, respectively.[15,16]

The purpose of this study was to assess predictors of early discontinuation of effective contraception during typical use by adolescents who live in Bronx County. The predictors we examined included measures of acculturation, school achievement, functional health literacy, as well as contraceptive method type.

Materials and Methods

Participants

From July 2012 to December 2013, we recruited a sample of 13- to 20-year-old women who chose a short-acting hormonal contraceptive method or an IUD during a health care visit. Continued use and reasons for nonuse were assessed prospectively at 3 and 6 months after the initial visit (see the Measures section). Recruitment sites included a hospital-based adolescent medicine practice, a community clinic, and 2 school-based health centers, all located in Bronx County, New York. All 4 recruitment sites provide confidential reproductive health care for teens. Adolescents who chose a short-acting hormonal contraceptive method or an IUD either for the first time or at least 6 months after stopping such a method were identified by their providers at the visit and were then approached by the research personnel. Patients who were found to be pregnant, were in foster care, or did not speak English were excluded. Adolescent patients provided informed consent; parental consent was not required. The study was approved by the institutional review boards of the Albert Einstein College of Medicine/Children's Hospital at Montefiore and the Children's Aid Society.

Of 153 consecutive patients approached, 145 (95%) agreed to participate. Contraceptive options at all 4 recruitment sites included IUDs, DMPA, COCs, transdermal patch (Patch), and intravaginal ring (Ring). At all 4 recruitment sites the IUD could be inserted at the time of the initial visit depending on provider availability, with no additional charge to the patient for the device. However, because of a limited number of trained providers, most participants who chose IUDs were given an appointment to return at a later date for insertion. All 4 sites provided DMPA shots on-site at the time of the initial visit. The community clinic site and the school-based health centers receive funding to dispense COCs, Patch, and Ring free of charge on-site whereas the hospital-based practice provides prescriptions for these methods to be filled at an outside pharmacy.

Measures

At enrollment, participants completed a self-administered questionnaire developed for this study that included the following measures: parental acculturation was assessed with questions about the language their parents prefer to use to speak to them at home.[17,18] School achievement was measured with questions on current school enrollment and last completed grade in school. Participants were coded as high school dropouts if they were not enrolled in school and the last completed grade was 11 or below. Functional health literacy was measured with administration of a tool validated in the adolescent age group, the Short Test of Functional Health Literacy.[19] This tool is used to assess reading comprehension using 36 fill-in-the-blank, multiple choice questions within 2 health-related prose passages. The scores are categorized as inadequate, marginal, or adequate functional health literacy. Reproductive history was assessed with a question on which contraceptive method was chosen today (day of recruitment), whether they had ever used birth control in the past and, if so, which methods were used and when they were last used. They were also asked if they had ever been pregnant. Continuation was assessed at 3 and 6 months after enrollment. Participants were contacted by telephone or in person and a structured interview was administered that included questions about contraceptive method use. Participants were considered as continuers if they were still using the chosen contraceptive method when assessed at 6 months. If participants reported that they never initiated their chosen method, reasons for not initiating the method were elicited. If participants initiated their chosen method but discontinued before 6 months, they were asked when and why they stopped using the method. Of the 145 participants enrolled, we were unable to contact 27. For 12 of 27, we were able to assess contraceptive method continuation from provider documentation in electronic medical records. The 15 of 27 participants with no documented visits in electronic medical records during the study period, or with visits that did not document contraceptive method use or nonuse were considered lost to follow-up. Thus we had 6-month outcome data for our primary measure of continuation on 130 of 145 of our participants (90%).

Statistical Analyses

Descriptive statistics were used to characterize demographic, acculturation, educational, functional health literacy, and reproductive history variables as well as continuation rates. To compare differences in variables of interest between users and nonusers after 6 months, we used the Student t test for continuous variables and χ^2 or Fisher exact test for categorical variables. Nonparametric alternatives were used for non-normally distributed data. Because of the small number of participants who chose Patch and Ring and similarity of the methods, we grouped