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Early Age at First Intercourse and Subsequent Gaps in Contraceptive Use

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Abstract

Background: Sexual debut before age 15 years has been associated with increased sexual risk behaviors among teens, but little is known about its effects beyond adolescence. This study examines the relationship between the age at first intercourse and subsequent contraceptive gaps.
Methods: We identified 3538 sexually active, fertile women participants from the 2006–2008 National Survey of Family Growth. Women were classified as consistent contraceptive users or inconsistent/nonusers. Age at first intercourse with a man was determined by self-report and categorized as <15, 15–17, and ≥ 18 years.
Results: Twenty-three percent reported gaps in contraceptive use in the year prior to interview. Compared with women who were 18 or older at first intercourse, women who were <15 years of age at the time of first intercourse were nearly two times as likely to report a gap in contraceptive use (adjusted odds ratio: 1.93; 95% confidence interval: 1.23–3.00).
Conclusions: Age at first intercourse is associated with inconsistent or nonuse of contraceptives in later life. Primary prevention efforts should be established to empower girls to make informed and autonomous decisions about sexual debut. Personalized contraceptive counseling has been demonstrated as being effective in increasing contraceptive use and compliance and should be offered to all women, with particular focus on women who report an early age at first intercourse or other factors associated with inconsistent contraceptive use.

Introduction

The average age of sexual debut for girls in the United States is 17 years of age.[1] Sociodemographic factors associated with contraceptive use have been well documented.[2–4] Sexual debut before age 15 years has been associated with increased sexual risk behaviors including unprotected intercourse,[5] multiple sexual partners,[6] and pregnancy[7] among teens. Although recent research has begun to examine the importance of the timing of sexual debut on physical, mental,[8] and reproductive outcomes throughout life,[9] little is known about the effect of sexual debut before age 15 years beyond adolescence. Previously, we reported that sexual debut before age 15 years (in particular, involuntary sexual debut before age 15 years) was associated with increased risk of experiencing multiple unintended pregnancies later in life,[10] suggesting that early sexual experiences may influence a woman's reproductive health beyond adolescence.

Persistent nonuse or gaps in contraceptive use among sexually active, fecund women who were not planning a pregnancy put them at risk for unintended pregnancy. In the United States, each year there are 3.1 million unintended pregnancies, 50% of which occur among women not using contraceptives in the month of conception.[11] Approximately half of unintended pregnancies end in abortion.[11] Unintended pregnancies resulting in births are associated with detrimental prenatal behavior, including drug and alcohol abuse, and poor birth outcomes.[12] Additionally, unintended pregnancies resulting in births account for 51% of publicly funded births nationwide, accounting for $11.1 billion in public maternity care expenditures.[13] Contraceptive nonuse is one of the most important processes contributing to unintended pregnancy. Approximately 10% of sexually active, fertile women not seeking a pregnancy are persistent nonusers of contraceptives, and an additional 15% of women experience a gap in contraceptive use lasting at least 1 month.[2,4] Contraceptive use gaps are associated with black race, lower levels of education, being uninsured or having Medicaid, being >40 years of age, and having infrequent intercourse.[2] This study seeks to examine the relationship between the age of first vaginal intercourse and subsequent gaps in contraceptive use. Understanding the impact of the timing of first intercourse on contraceptive nonuse later in life may be important in

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promoting contraceptive use and preventing unintended pregnancy.

Materials and Methods

Data were obtained from the first data release of the continuous National Survey of Family Growth (NSFG) comprised of 7356 face-to-face interviews with women aged 15–44 years, collected between July 2006 and December 2008. The NSFG is designed to collect information on factors affecting "childbearing, marriage, and parenthood from a national probability sample of women and men 15–44 years of age".[14] The sampling procedure has been described elsewhere.[15] We obtained ethical approval from the Virginia Commonwealth University Human Subjects Review Board.

For this study we sought to identify women at risk of unintended pregnancy. That is, we did not include women who were currently pregnant ($n=330$) or trying to conceive ($n=242$), who reported that they had never had sex ($n=1027$) or did not have at least one sex partner in the year prior to interview ($n=656$). A total of 67 women had missing contraceptive use data and an additional 144 women had missing data on one of the other variables in the analysis.

The remaining 3358 women who reported that they were fecund (i.e., not surgically or medically sterile) were included in the analysis.

Women reported whether or not they had intercourse with a male partner within the 12 months preceding the interview. For each month in which women reported sexual activity, the participants reported any contraceptive method use, including partner's vasectomy or withdrawal. We classified women into two categories of contraceptive use: (1) consistent users (reference category) or (2) inconsistent users. Women were considered to be consistent users of contraception if they reported the use of any type of contraceptive method in each sexually active month, regardless of the number of sexually active months. Inconsistent users were women reporting a contraceptive use gap of at least one sexually active month. All contraceptive methods were considered equally without any differentiation by method.

The primary determinant of interest was age at first intercourse. To assess age at first intercourse, women were asked, "At any time in your life, have you ever had sexual intercourse with a man, that is, made love, had sex, or gone all the way?" Women were specifically instructed not to count oral or anal sex, heavy petting, or other forms of sexual activity that did not involve vaginal penetration. Women answering yes to this question were then asked for the month and year of this first intercourse and their age at the time of first intercourse. Age at first sexual intercourse was categorized as <15, 15–17, and ≥ 18 years. This categorization allowed comparison to previous literature.[10,16]

We reviewed the literature to understand which factors have been associated with age at first intercourse and/or contraceptive use. These fell in three domains: sociodemographic factors, childhood factors, and sexual history factors.

Contraceptive gaps and nonuse are associated with race/ethnicity, education, insurance status, age, and marital status.[2,11] Thus we considered each respondent's age at interview (15–19, 20–34, 35–45 years), education (less than high school, high school graduate or equivalent, or at least some college), self-reported race and ethnicity (white, non-Hispanic, black, non-Hispanic, Hispanic, or other non-Hispanic), whether respondent was foreign born, and marital status (married, cohabitating, formerly married, not cohabitating, or never married). Economic factors may influence a woman's ability to obtain and consistently use contraceptive drugs or devices; therefore, we considered economic indicators at the time of interview including current insurance status (private insurance, Medicaid, or no coverage) and poverty status based on income as a percentage of the federal poverty level ($<100\%$, 100–199%, or $>200\%$).

Adolescent sexual behavior research has shown that childhood and family factors including socioeconomic status during childhood,[17,18] parental living situation,[17,18] and mother's reproductive history, particularly early childbearing,[17,19] are associated with the occurrence of adolescent pregnancy,[20] earlier sexual intercourse,[17,20] and more risky sexual practices including increased number of lifetime sex partners.[17,18] These factors are also associated with multiple unintended pregnancies.[10] Childhood family status was assessed by asking respondents about the parents or parental figures they resided with at age 14. Parental living situation at age 14 was then categorized as living with two biological or adoptive parents or living in any other parental or nonparental situation. To estimate socioeconomic status during childhood, respondents were asked to identify the highest level of education that their mother or mother figure (less than high school, high school graduate, or at least some college) and that their father or father figure had completed (less than high school, high school graduate, at least some college, or no father figure). "No father figure" was considered to be a valid category because the absence of a father in the home has meaning as a proxy for childhood socioeconomic status.[21]

Having a mother who was a teenage mother has been associated with early age of intercourse, having a teen pregnancy, and other sexual risk behaviors.[22,23] Respondents were asked to identify their mother's age at the time of her first birth, from which we identified women whose mother had a first birth during her teens, defined as <18 years of age.

Finally, we considered the respondent's sexual history variables, specifically the number of sexual partners in the 12 months before the interview (1 or ≥ 2) and the number of months in the prior year with at least one reported episode of intercourse with a male partner (1–4, 5–9, 10–12 months). We also evaluated whether the respondent had ever been pregnant, her future pregnancy intentions, and abortion history. Pregnancy and abortion history were based on self report. Two dummy variables using a nested coding approach were defined.[24] First, women were classified as ever having been pregnant (yes/no). Then, women who had at least one pregnancy were asked how each pregnancy ended (live birth, stillbirth, pregnancy loss, or abortion). The number of abortions was counted and women were classified as having ever had an abortion (yes/no). With this approach we were able to evaluate the effect of abortion history only among women having experienced at least one pregnancy. Women were considered as intending a future pregnancy if they responded "yes" or undecided to the survey question, "Looking to the future, do you, yourself want to have a baby (or another baby)?" These categories were considered together because we hypothesized that women undecided about their future childbearing intentions would be more similar to those

desiring to preserve fertility with respect to contraceptive decision making.

Statistical analysis

To account for the complex survey design of the NSFG, all analyses of the data were conducted using SUDAAN, [25] with sample weights provided in the NSFG.[15] We first compared the characteristics of women according to their category of contraceptive use (inconsistent and consistent users [referent]). Logistic regression models were used to understand the relationship between age at first intercourse and inconsistent contraceptive use adjusting for sociodemographic, childhood, and sexual history variables. An iterative process of modeling was employed in which potential confounders were individually introduced into the model. Potential confounders were retained in the model if their addition resulted in a greater than 10% change in the odds ratio for the association between age at first intercourse and inconsistent or nonuse of contraceptives. To determine if the impact of age at first intercourse decreases with increasing age at interview we conducted a sensitivity analysis of women at least 18 years old at first interview and stratified the crude and fully adjusted model by age at interview (18–24, 25–34, or 35–44 years). Additionally, to estimate the effect of involuntary first sex on the relationship between age at first intercourse and contraceptive use gaps, we conducted a sensitivity analysis among women 18 or older at the time of interview (for whom the relevant question was asked).

Results

The average age of first intercourse in our sample was 17.5 years of age, with 13% ($n = 517$) of women reporting their first intercourse at <15 years of age. Inconsistent use of contraceptives in the year prior to interview was reported by 22.7% of women. Among contraceptive users, the most common methods used in the month prior to interview were the oral contraceptive pill (31%), condoms (21%), and various forms of long-acting reversible contraceptives (e.g., intrauterine devices, injectables or implants; 10%). Characteristics of the sample by contraceptive use status are summarized in Table 1. Compared with consistent users of contraceptives, inconsistent users were more likely to be black or Hispanic, married or cohabitating, and have lower levels of education, lower income, and Medicaid or no insurance coverage. Inconsistent users were also more likely to report at least one pregnancy and have less frequent intercourse in the year prior to interview, as compared with consistent users. Having a mother or father with less than a high school education was associated with an increased risk of inconsistent use of contraceptives in crude models, but lost significance after adjustment for the respondent's own highest level of education.

Table 2 shows the relationship between age at sexual debut and contraceptive use. Experiencing first intercourse before age 15 was associated with an increased risk of reporting inconsistent use of contraceptives in the year prior to interview. Relative to women reporting a sexual debut at 18 years of age or older, women reporting age at first sexual intercourse as less than 15 years were more likely to report inconsistent use (crude odds ratio [OR]: 2.57; 95% confidence interval [CI]: 1.72–3.87), as well as women whose sexual debut was between 15 and 17 years (crude OR: 1.48; 95% CI: 1.11–1.98). After adjustment for all potential confounders, as compared with women who were 18 or older at first intercourse, women who were <15 years old at the time of first intercourse were 1.93 times as likely (adjusted odds ratio [aOR]: 1.93; 95% CI: 1.23–3.00) to have inconsistent contraceptive use in the year prior to interview and women who were 15–17 years old at the time of first intercourse were 1.23 times as likely to use contraceptives inconsistently (aOR: 1.23; 95% CI: 0.89–1.70).

While other factors predominate gaps in contraceptive use among women interviewed between ages 18 and 24 years, being <15 years at first sex remained an important factor for women aged 25–34 or 35–44 years at time of interview (data not shown). After adjustment for all potential confounders women who were 25–34 or 35–44 years old at time of interview and <15 years of age at first intercourse had two times ($aOR_{25\text{-}34yrs}$: 2.01; 95% CI: 1.08–3.72) and 4.5 times ($aOR_{35\text{-}44yrs}$: 4.51; 95% CI: 1.58–12.84) increased likelihood of inconsistent contraceptive use as compared with women in the same age group who were 18 or older at first intercourse. Among women who were 18–24 years old at interview, those who reported their first intercourse at less than 15 years of age were no more likely to report inconsistent contraceptive use as compared with women who were 18 or older at first intercourse (aOR: 0.76; 95% CI: 0.29–2.00).

Approximately 7% of eligible women over 18 years (of whom the question was asked) reported that their first intercourse was nonvoluntary. Among women <15 years at first intercourse, 18% reported nonvoluntary first sex, compared with 5% and 6% of women who were 15–17 and 18 years or older, respectively, at first intercourse. For women reporting first intercourse at <15 years of age, the magnitude of the association was similar for women reporting that intercourse to be voluntary (aOR: 1.96; 95% CI: 1.22–3.15) and nonvoluntary (aOR: 1.96; 95% CI: 0.77–5.02) compared with women reporting voluntary first intercourse at 18 years or older. However, the confidence interval for nonvoluntary intercourse is wide and contains 1. A similar pattern was observed for women who were 15–17 years at first intercourse (voluntary aOR: 1.25; 95% CI: 0.89–1.73 and nonvoluntary aOR: 1.61 95% CI: 0.90–2.88).

Discussion

This study confirms that the effects of early sexual experiences may linger well beyond adolescence. Our findings are consistent with previous reports supporting the importance of age at sexual debut on sexual health outcomes.[9,10] Indeed, this study illustrates that the impact of sexual debut at <15 years of age on contraceptive use may persist beyond adolescence.

Contraceptive use is an expression of a woman's reproductive control and is affected by access to family planning services and a variety of sociodemographic factors, relationship dynamics, societal norms, and economic factors. We found that 23% of sexually active women had a gap in contraceptive use lasting at least 1 month, despite not seeking pregnancy. Contraceptive use is one of the most important tools for reducing the burden of unplanned pregnancies. Consistent with 2002 and 2006 NSFG data,[26] we identified 8.1% of our sample as nonusers and 14.6% as those who had a gap of at least 1 month. This is comparable with the United Kingdom and Europe and exceeds less developed countries.[27]

Table 1. Respondent Characteristics by Contraceptive Use in the Year Before Interview

	Inconsistent use n = *791 (22.7%)* *Weighted* n = *6,531,544*	*Consistent use* n = *2747 (77.3%)* *Weighted* n = *22,252,561*
	Weighted %	
Age at first intercourse, years		
<15	20.2	11.0
15–17	49.4	46.6
≥18	30.4	42.4
Sociodemographic factors		
Age at interview, years		
15–19	10.3	12.4
20–34	64.7	60.3
35–45	25.0	27.3
Education		
Less than high school	24.2	13.9
High school graduate	26.6	21.8
At least some college	49.2	64.3
Race/ethnicity		
White, non-Hispanic	58.2	66.3
Black, non-Hispanic	17.4	12.5
Hispanic	19.3	14.4
Other, non-Hispanic	5.2	6.8
Foreign born	14.5	15.7
Poverty level[a]		
<100% FPL	27.1	15.5
100–199% FPL	26.6	20.9
≥200% FPL	46.3	63.5
Insurance status		
Private insurance	53.9	71.3
Medicaid	22.0	9.9
No coverage	24.2	18.7
Marital status		
Married	49.5	42.5
Cohabitating	15.6	14.1
Formerly married	10.1	6.8
Never married	24.9	36.6
Childhood/adolescent factors		
Lived with 1 or 0 biological/adoptive parents	36.5	32.5
Mother <18 years at first birth	17.1	13.3
Mother's highest education		
Less than high school	25.0	19.0
High school graduate	32.0	31.3
At least some college	43.1	49.7
Father's highest education		
Less than high school	25.2	16.4
High school graduate	28.4	28.3
At least some college	38.9	48.1
No father figure present	7.5	7.2
Sexual history variables		
Ever pregnant		
Intends future pregnancy/does not know intent	61.0	60.7
Abortion history		
One or more abortions	16.6	13.7
No abortions	63.9	41.9
Never pregnant	19.5	44.4
No. of months had sex		
1–4	14.4	14.3
5–9	24.9	18.9
10–12	60.8	66.8
≥2 sex partners in last 12 months	15.4	16.3

[a]FPL, federal poverty level.

Table 2. Association Between Age at First Intercourse and Inconsistent or Nonuse of Contraceptives

	Crude odds ratio (95% confidence interval)	*Adjusted odds ratio (95% confidence interval)*[a]
Age at first intercourse, years		
<15	2.57 (1.72–3.87)	1.93 (1.23–3.00)
15–17	1.48 (1.11–1.98)	1.23 (0.89–1.70)
≥18	1.00 (Referent)	1.00 (Referent)
Sociodemographic factors		
Education		
Less than high school	2.28 (1.49–3.48)	1.82 (1.16–2.84)
High school graduate	1.59 (1.19–2.12)	1.29 (0.98–1.72)
At least some college	1.00 (Referent)	1.00 (Referent)
Age at interview, years		
15–19	0.77 (0.54–1.12)	0.77 (0.44–1.35)
20–34	1.00 (Referent)	1.00 (Referent)
35–45	0.85 (.59–1.23)	0.90 (0.57–1.42)
Race/ethnicity		
White, non-Hispanic	1.00 (Referent)	1.00 (Referent)
Black, non-Hispanic	1.58 (1.10–2.28)	1.28 (0.81–2.01)
Hispanic	1.53 (1.04–2.27)	1.14 (0.76–1.71)
Other, non-Hispanic	0.87 (0.44–1.72)	1.12 (0.54–2.34)
Foreign born	0.91 (0.67–1.22)	0.58 (0.37–0.92)
Poverty level		
<100% FPL	2.39 (1.59–3.60)	1.52 (1.03–2.25)
100–199% FPL	1.75 (1.17–2.61)	1.30 (0.83–2.02)
≥200% FPL	1.00 (Referent)	1.00 (Referent)
Insurance status		
Private insurance	1.00 (Referent)	1.00 (Referent)
Medicaid	2.92 (1.88–4.54)	1.77 (1.12–2.79)
No coverage	1.71 (1.24–2.34)	1.24 (0.88–1.74)
Marital status		
Married	1.71 (1.18–2.48)	2.50 (1.54–4.08)
Cohabitating	1.63 (1.15–2.30)	1.63 (1.08–2.47)
Formerly married	2.17 (1.18–4.00)	1.88 (0.91–3.87)
Never married	1.00 (Referent)	1.00 (Referent)
Childhood/adolescent factors		
Lived with 1 or 0 biological/adoptive parents	1.19 (0.87–1.64)	0.78 (0.54–1.12)
Mother <18 years at first birth	1.35 (0.96–1.91)	0.94 (0.63–1.39)
Mother's highest level of education		
Less than high school	1.52 (1.06–2.18)	0.84 (0.56–1.26)
High school graduate	1.18 (0.88–1.59)	0.94 (0.70–1.27)
At least some college	1.00 (Referent)	1.00 (Referent)
Father's highest level of education		
Less than high school	1.90 (1.29–2.79)	1.20 (0.75–1.91)
High school graduate	1.24 (0.94–1.63)	0.96 (0.69–1.35)
At least some college	1.00 (Referent)	1.00 (Referent)
No father figure	1.29 (0.79–2.10)	0.93 (0.49–1.80)
Sexual history factors		
Ever pregnant	3.48 (2.55–4.76)	2.82 (1.87–4.26)
Intends future pregnancy/does not know intent	1.01 (0.76–1.34)	1.58 (1.11–2.25)
Ever had an abortion	0.77 (0.53–1.19)	0.87 (0.62–1.21)
≥2 sex partners in last 12 months	0.93 (0.64–1.35)	1.06 (0.67–1.67)
No. of months had sex		
1–4	1.11 (0.70–1.75)	1.54 (0.99–2.38)
5–9	1.44 (1.09–1.91)	2.08 (1.54–2.83)
10–12	1.00 (Referent)	1.00 (Referent)

[a]Adjusted for all factors on the table.

Prior research has noted coercive first intercourse is associated with reduced control over subsequent sexual relationships[28] and a reduced ability to use contraceptives effectively[28] and is strongly associated with experiencing multiple unintended pregnancies.[10] Further, coercive sex, including childhood sexual abuse, has been associated with increased risky sex behaviors[29] and a reduction in self-efficacy,[30] which may contribute to inconsistent contraceptive use. In our nationally representative sample of U.S. women, 18% of those reporting sexual debut before age 15 years indicated that the sexual act was not voluntary. However, this may be a conservative estimate due to underreporting of

coercive acts. That we did not find a larger association between contraceptive use gaps among those reporting nonvoluntary first intercourse may be a function of underreporting or small sample size.

We stratified by age to determine the extent to which the impact of age at first intercourse changes with increasing time. Our findings indicate that women who were 25–44 years at interview and <15 years at first intercourse had higher odds of inconsistent contraceptive use compared with similar women who were 18 years or older at first intercourse. Whereas women aged 18–24 years at interview and less than 15 years at first intercourse were no more likely to experience contraceptive use gaps as compared with women in the same age group with later sexual debut. We cannot rule out that the age-stratified analyses represent a cohort effect. As societal norms regarding the social acceptability of adolescent and premarital intercourse have changed over time, the impact of age at first intercourse may differentially affect women coming of age with different societal expectations. Additionally, women who were older at time of interview may have been in more stable relationships or held beliefs of subfecundity that reduced incentive to use contraception.

Several hypotheses may explain why sexual debut at <15 years is related to later contraceptive use. First, women who engage in their first intercourse at younger ages may be risk-prone. Risk-proneness is defined as the propensity to be attracted to potentially risky behavior.[31] Early intercourse has been associated with an increase in sexual risk behavior including decreased condom and contraceptive use and unintended pregnancies,[5–7] but may in fact represent an indicator of individuals who have an increased attraction to or tolerance of risk. Identifying such risk-prone individuals in early adolescence and providing specific contraceptive information and readiness discussions may be warranted. Second, sexual debut at <15 years is more likely to be nonvoluntary and even when reported as voluntary, young adults reporting younger age at first intercourse are more likely to report a nonautonomous reason for engaging in intercourse (such as peer pressure or desire to please a partner), experience regret with respect to the timing of intercourse, and report that they wished they had waited longer. If sexual debut at these ages is nonvoluntary or induced by peer-pressure, it may reduce self-efficacy and influence a woman's ability to protect herself from sexual risks.[32] Primary prevention efforts to empower girls to make informed and autonomous decisions about sexual debut as well as cognitive–behavioral interventions aimed at increasing sexually assertive beliefs, behaviors, and practices[32] for women of all ages may be justified.

Nevertheless, these findings do have implications for practice. Brief counseling in clinics is associated with increased sexual health knowledge and lower rates of sexually transmitted infection in young women.[33] A recent study found that among women aged 35–44 years, contraceptive counseling was associated with lower rates of nonuse,[34] and personalized contraceptive counseling has been shown to improve contraceptive adherence.[35] However, less than 20% of women overall report that they have received any form of contraceptive counseling in the 12 months prior to interview. Inquiring about age at first intercourse on patient intake forms may assist providers in identifying women at higher risk for contraceptive use gaps and allow for targeted contraceptive and behavioral counseling.

These data must be considered with several caveats. First, data on psychological factors that may be associated with contraceptive use, such as depression and risk proneness, are not available in the NSFG. Second, contraceptive use in this study was evaluated as self-reported use of any contraceptive drug or device during a month in which intercourse was reported. This definition of contraceptive use is limited in that it does not consider whether contraceptives were used correctly, consistently, or with every episode of intercourse. Additionally as most women in the sample relied on the same methods (pill, condom, long-acting reversible contraceptives), all contraceptive drugs and devices were considered equal, which does not address differences in obtaining, use, and effectiveness of methods. Further, we classified women according to biological age at sexual debut. A more appropriate concept may be sexual readiness, which is characterized by evaluating planning, whether intercourse was consensual, absence of regret, and autonomy of the decision to have sex.[36] Future research should include an evaluation of sexual readiness at first intercourse.

Conclusion

In summary, inconsistent or nonuse of contraceptives is a common, but potentially modifiable factor. In the United States, 3.1 million unintended pregnancies occur each year.[11] Because 50% of unintended pregnancies occur among women not using contraceptives in the month of conception,[11] it is important to further our understanding of factors contributing to gaps in contraceptive use. These findings demonstrate that a young age at first intercourse may affect a woman's reproductive health throughout her life. Our findings may give reason to consider interventions that delay sexual initiation, as well as interventions to promote consistent contraceptive use throughout reproductive life.

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Disclosure Statement

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