

Association between use of marijuana and time to pregnancy in men and women: findings from the National Survey of Family Growth

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Objective: To determine if regular use of marijuana has an impact on time to pregnancy.

Design: Retrospective review of cross-sectional survey data from male and female respondents aged 15–44 years who participated in the 2002, 2006–2010, and 2011–2015 National Survey of Family Growth.

Setting: Not applicable.

Participant(s): The National Survey of Family Growth is a nationally representative population-based sample derived from stratified multistage area probability sampling of 121 geographic areas in the U.S. Our analytic sample was participants who were actively trying to conceive.

Intervention(s): Exposure status was based on the respondents' answers regarding their marijuana use in the preceding 12 months.

Main Outcome Measure(s): The main outcome was estimated time to pregnancy, which was hypothesized before analysis to be delayed by regular marijuana use.

Result(s): A total of 758 male and 1,076 female participants responded that they were actively trying to conceive. Overall, 16.5% of men reported using any marijuana while attempting to conceive, versus 11.5% of women. The time ratio to pregnancy for never smokers versus daily users of marijuana in men was 1.08 (95% confidence interval 0.79–1.47) and in women 0.92 (0.43–1.95), demonstrating no statistically significant impact of marijuana use on time to pregnancy.

Conclusion(s): Our study suggests that neither marijuana use nor frequency of marijuana use was associated with time to pregnancy for men and women. (Fertil Steril® 2018; ■:■–■. ©2018 by American Society for Reproductive Medicine.)

Key Words: Fertility, infertility, marijuana

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About 15% of couples are unable to conceive after 1 year of trying and are labeled infertile (1, 2). Although many lifestyle factors including alcohol use, psychosocial stress, Western dietary preference, higher body mass index (BMI) and waist circumference, and smoking have all been associated with delayed pregnancy, marijuana use has been relatively understudied (3–7).

Marijuana is the most commonly used recreational drug in the United States today, with an estimated 22.2 million people using it within the preceding month and 117 million lifetime users (8–10). It is also the fastest growing recreational drug, with an increase in uptake of 4% from 2002 to 2015. Interestingly, there is a widening gender gap in the use of marijuana, with an increasingly higher prevalence

among men than women (8). Twenty-six states and the District of Columbia currently have laws that have broadened legalization of medical marijuana and seven states and the District of Columbia have laws permitting recreational use (11).

To date, there are limited data regarding the impact of marijuana use on fertility. Plowden et al. performed a small secondary analysis of a randomized controlled trial that had a total of 1,228 enrolled subjects, examining time-to-pregnancy (TTP) effect of alcohol, tobacco, and marijuana and finding that marijuana use in the preceding year led to delayed TTP (12). Wesselink et al., in an internet-based

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prospective study, found that in a study of 510 couples, women who smoked marijuana at least once a week had reduced fecundability whereas men who smoked marijuana at least once a week had increased fecundability (13). Gundersen et al. studied a cohort of Danish men and reported reduced sperm concentration and total sperm count in weekly users of marijuana (14). Mueller et al. in 1990 found that women who used marijuana within the year preceding attempted pregnancy were twice as likely to have ovulatory infertility (15). Since 2002, the prevalence of pregnant women using marijuana has increased 62%, with the highest percentage of women using marijuana during pregnancy being 18–25 years of age (16, 17). Although the prenatal impact of marijuana ranges from fetal growth restriction to placental resistance to preterm birth, the clinical impact on the ability to conceive remains unknown (18, 19). Given increased legalization of both recreational and medical marijuana in the United States, the highest rates of marijuana use being among the reproductive ages, and limited knowledge regarding its effects on infertility, the present study sought to determine the association between marijuana use and TTP among men and women.

METHODS

Design and Study Population

The study population was composed of 758 male and 1,076 female respondents aged 15–44 years who participated in the 2002, 2006–2010, and 2011–2015 National Survey of Family Growth (NSFG; www.cdc.gov/nchs/nsfg) and were actively trying to become pregnant. The target population for this survey was all reproductive-age men and women in the United States; to obtain a nationally representative sample, the participants were derived via stratified multistage area probability sampling of 121 geographic areas in the United States. Selection was random, but sampling was done at higher rates for certain subgroups, such as Hispanic men and women, non-Hispanic black men and women, and teenagers (15–19 y). The overall response rate was 78% for men and 80% for women for 2002, 75% men and 78% women for 2006–2010, and 72% men and 73% women for 2011–2015. The NSFG survey was reviewed and approved by Research Ethics Review Board of the Centers for Disease Control and Prevention and National Center for Statistics and the University of Michigan.

Data Collection

Data for the NSFG were collected through questionnaires distributed to households across the United States by trained interviewers using computer-assisted interviewing techniques. Information was collected on sociodemographic characteristics, health history, sexual behaviors and attitudes, fatherhood, drug use, birth expectations, and characteristics of current and former partners or cohabiting partners. Only one individual per household was surveyed, and given the nature of the survey, information on motherhood was not collected from women who were currently trying to conceive.

For the current-duration approach, we used methods that have been previously described and applied to NSFG data (20–24). Briefly, two questions in the NSFG directly assessed the duration of the respondent's current pregnancy attempt. Women who were not using a method of contraception nor pregnant but were sexually active at the time of interview ($n = 1,078$ potentially eligible respondents) were asked, "Is the reason you are not using a method of birth control now because you, yourself, want to become pregnant as soon as possible?" Women who responded "Yes" were then asked, "How long have you been trying to become pregnant? (number of months or years)," which was used to determine their current duration of pregnancy attempt ("current duration") in months. Regardless of pregnancy intentions, women were not considered to be at risk for pregnancy if they had a live birth or stillbirth within the past 3 months, reported one or more months without intercourse in the past 3 months, or if their current partner had a vasectomy. Women were not included in the current-duration analysis if they were not at risk of pregnancy (i.e., using contraception, pregnant, or not sexually active) or were at risk but not currently trying to become pregnant. Similarly, men were asked if they were married, cohabiting, or in a sexually active relationship with at least one partner in the last year. Men who were with a female partner within the past year who was not known to be physically unable to have a child were asked about their partner's current pregnancy status. Men/couples considered to be "at risk for pregnancy" were sexually active in the past year, reported that they or their partner was not using contraception, and had a partner who was not currently pregnant. Similarly to women, men's current duration values were derived from two questions: "Are you and your wife/partner currently trying to get pregnant?" and if so, "How long have you been trying to become pregnant? (number of months or years)?" In survey years 2006–2015, men and women who reported that it was impossible for them or their partner to have a baby for reasons other than surgical sterilization were not included in the current-duration sample.

The current-duration approach was developed to improve the study of fecundity because it can be challenging to measure the length of pregnancy attempts, i.e., TTP. Retrospective and prospective TTP study designs can miss certain aspects that contribute to pregnancy (25). For example, some women never get pregnant and may be missed by retrospective studies among pregnant women, thereby biasing results. Furthermore, women who do not plan their pregnancies can be missed in prospective studies because women must join the studies before the start of their pregnancy attempt (26–29). The current-duration approach is a recent method that uses cross-sectional data to estimate fecundity and infertility rates. Unlike retrospective and prospective TTP studies, the current-duration approach uses cross-sectional design (used by many existing population-based surveys) and includes couples who do not plan their pregnancies and couples that will never get pregnant.

We censored attempts >36 months to control for measurement error in longer attempts. Recall for TTP has been shown to be acceptable for shorter periods, so we censored

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