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Original article

Factors associated with pregnancy intention among women who have experienced a short birth interval: findings from the 2009 to 2011 Mississippi and 2009 Tennessee Pregnancy Risk Assessment Monitoring System

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ABSTRACT

Purpose: One-third of all pregnancies in the United States are conceived within 18 months of a prior live birth. Preventing unintended pregnancies may help to decrease the prevalence of pregnancies with these short interpregnancy intervals. However, data on factors associated with pregnancy intention among women who have had short birth intervals are sparse. Pregnancy Risk Assessment Monitoring System data were used to further evaluate these associations.

Methods: Because only Mississippi and Tennessee Pregnancy Risk Assessment Monitoring System include a survey question about birth interval length, this analysis was limited to women from those states who recently had a short birth interval ($n = 384$). Pregnancy intention and demographic, lifestyle, and reproductive data were obtained from surveys and birth certificates. Logistic regression was used to obtain odds ratios (ORs) and 95% confidence intervals (CIs).

Results: Nearly 76% of women with short birth intervals reported their pregnancy as unintended. Women who were non-Hispanic black or consumed alcohol during pregnancy had statistically significant increased odds of reporting the pregnancy with a short birth interval as being unintended (OR = 3.98; 95% CI: 1.73–9.16 and OR = 10.56; 95% CI: 1.80–61.83, respectively).

Conclusions: Although all women should be counseled on postpartum contraceptive use, findings suggest that important subpopulations of women may benefit from more targeted counseling during prenatal care visits and the immediate postpartum hospital stay regarding the importance of using contraception to not only better space pregnancies but also prevent unintended pregnancies.

Introduction

Pregnancies with short interpregnancy intervals account for one-third of pregnancies in the United States [1]. Evidence suggests that women should wait at least 18 months after a live birth before attempting their next pregnancy to avoid adverse pregnancy outcomes [2]. In particular, many studies have demonstrated that short interpregnancy intervals are associated with increased risks of preterm birth and low birth weight [3–16]. Although not studied extensively, research also suggests that short interpregnancy intervals are associated with other adverse pregnancy outcomes including small for gestational age, birth defects, fetal or neonatal death, anemia, premature rupture of membranes, third trimester bleeding, placenta previa, and maternal death [3–5]. Consequently, one of the Healthy People 2020 objectives is to reduce the proportion of pregnancies conceived within 18 months of a previous birth to 29.8%, a 10% improvement [1].

A number of studies have investigated factors associated with short interpregnancy intervals, with many of these studies focusing on adolescents [17–21] or other specific populations such as African-born immigrants [22]. Factors found to be associated with

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short interpregnancy intervals include younger age, minority race/ethnicity, lower income, and lower education [22–25].

Preventing unintended pregnancies may help to decrease the prevalence of pregnancies with short interpregnancy intervals. Some studies of National Survey of Family Growth (NSFG) data have explored how pregnancy intention may impact short interpregnancy intervals [17,23,26]. For example, one study stratified analyses by pregnancy intention status [23] while other studies considered pregnancy intention as a main exposure [26] or used pregnancy intention to further define their outcome measures [17]. However, data on factors associated with pregnancy intention among women who have had short birth intervals are sparse. A recent study that also used NSFG data examined how demographic variables were associated with pregnancy intention among women who had a short interpregnancy interval (defined as a pregnancy conceived within 18 months of a previous birth) [24]. Another study evaluated factors associated with pregnancy intention among women who had interpregnancy intervals of 18 months or less using data from the First Baby Study, a cohort study of Pennsylvania women [27]. Although informative, these studies did have some limitations. The study that used NSFG data was only able to explore the role of demographic variables on pregnancy intention among women experiencing a short interpregnancy interval due to the constraints of the NSFG data set [24]. The findings of the First Baby Study may have had limited generalizability because the women in the cohort were primarily non-Hispanic white, married, and of higher income and educational levels [27].

To our knowledge, the two aforementioned studies are the only studies to specifically examine factors associated with pregnancy intention among women with short birth intervals. To expand on these prior studies, we used population-based data from the Pregnancy Risk Assessment Monitoring System (PRAMS) to evaluate the relationships of selected demographic, lifestyle, and reproductive factors with pregnancy intention among women who recently had a pregnancy with a short birth interval.

Material and methods

PRAMS data from Mississippi (2009–2011) and Tennessee (2009) were used for this secondary data analysis. PRAMS is an annual, state-specific, population-based surveillance system conducted by the Centers for Disease Control and Prevention and state health departments [28]. Every month, a stratified systematic sample of women who have recently given birth to a live infant is drawn from birth certificate files of states participating in PRAMS [28]. The sampled mothers are first mailed letters that introduce them to PRAMS. Then the mothers are sent an initial packet that includes a cover letter, survey, question and answer brochure, calendar to aid memory, and participation incentive. Survey materials are available in both English and Spanish.

The PRAMS survey asks women to recall their attitudes and experiences before, during, and shortly after pregnancy. All states that participate in PRAMS administer a set of “core” questions on their surveys. States may choose to include additional questions that are relevant to the state's population. PRAMS personnel also collect data from birth certificates that are linked with the survey data for analysis. This unique linking and the availability of birth certificate data for all births provides the basis for drawing stratified samples and generalizing results to the state's entire population of births [28]. A question on birth interval length was only included in surveys for Mississippi and Tennessee during phase VI of data collection. Specifically, the survey included the following question: “When your new baby was born, how old was the child born just before your new baby?” Participants could choose from the following responses: 0–12 months, 13–18 months, 19–24 months, more than 2 years but less than 3 years, 3–5 years, or more than 5 years. Although the definition of short birth interval has been inconsistent in the literature, evidence suggests that women should wait at least 18 months after a live birth before attempting a subsequent pregnancy [1]. Therefore, we defined a short birth interval to be less than or equal to 18 months between births.

Thus, this study used 2009–2011 data from Mississippi and 2009 data from Tennessee (the most recent years of available data with response rates near or above the Centers for Disease Control and Prevention–defined threshold of 65%) [29]. Women who were not between the ages of 18–40 years ($n = 80$), did not have a short birth interval (defined as $\leq$18 months between births, $n = 1826$), and did not respond to the question about pregnancy intention ($n = 2$) were excluded from the analysis. Thus, 384 women remained. This secondary data analysis was approved by UNC Charlotte's Institutional Review Board.

Measurement of pregnancy intention

The PRAMS survey asked women to recall their pregnancy intentions. Specifically, women were asked the following question: “Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant? Check one answer.” Response choices for this question were: I wanted to be pregnant sooner, I wanted to be pregnant later, I wanted to be pregnant then, or I did not want to be pregnant then or at any time in the future. For this analysis, women who indicated they wanted to be pregnant then or sooner were considered to have had an intended pregnancy. Women who stated they wanted to be pregnant later or not at all were categorized as having an unintended pregnancy.

Measurement of predictors

Information on demographic, lifestyle, and reproductive factors was collected on the PRAMS survey and birth certificates. Given the limited research on factors associated with pregnancy intention among women who have experienced a short birth interval, we relied on general findings related to unintended pregnancy to inform our selection of predictors [30,31]. Factors considered in this analysis included the following: maternal age, maternal education, maternal race/ethnicity, marital status, income, health insurance, smoking and alcohol use during pregnancy, adequacy of prenatal care (based on the Kessner index), parity, breastfeeding, and contraceptive use. Information on income, alcohol use, breastfeeding, and contraceptive use was gathered from survey data, while all other potential confounding variables were obtained from birth certificate data.

Statistical analysis

Summary statistics of the sample population of women who experienced a short birth interval were calculated. Logistic regression was used to obtain unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) to provide a crude measure of the association between each of the demographic, lifestyle, and reproductive factors and pregnancy intention among women with a short birth interval. A multivariable model was created by first including all potential predictors in the model. Next, a backward elimination procedure was used to retain only those predictors with $P < .20$ [32]. Ultimately, race/ethnicity, health insurance, smoking during pregnancy, and alcohol use during pregnancy were retained in the final multivariable model. SAS survey procedures (version 9.4, SAS Institute Inc. Cary, NC) were used to account for the complex sampling design and weighting used by PRAMS.

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