Are pregnancy planning and timing associated with preterm or small for gestational age births?

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Objective: To investigate whether unplanned or poorly timed pregnancies (self-reported at enrollment) are associated with preterm or small for gestational age births.
Design: Prospective cohort study.
Setting: Not applicable.
Patient(s): Two thousand six hundred fifty-four pregnant women <18 weeks estimated gestational age with a singleton pregnancy.
Intervention(s): None.
Main Outcome Measure(s): Preterm and small for gestational age births.
Result(s): In adjusted analyses, pregnancy planning was not statistically significantly associated with preterm (odds ratio [OR] 1.18; 95% confidence interval [CI], 0.85–1.65) or small for gestational age birth (OR 1.17; 95% CI, 0.69–1.97). Similarly, poorly timed pregnancies were not statistically significantly associated with preterm (OR 0.85; 95% CI, 0.53–1.38) or small for gestational age birth (OR 0.92; 95% CI, 0.65–1.29). Combining pregnancy planning (yes/no) and timing (yes/no) into a 4-level category showed no statistically significant association with preterm birth or small for gestational age.
Conclusion(s): In a large cohort with antenatally assessed pregnancy planning and timing, outcome data collected from medical record abstraction, and robust analysis adjusting for multiple confounding factors including maternal demographics, medical conditions, and other risk factors, neither pregnancy planning nor pregnancy timing showed a statistically significant association with preterm or small for gestational age infants. This study improves upon previous analyses that lacked adjustment for confounding and used retrospective self-reporting to assess pregnancy planning and timing, and preterm and small for gestational age births. Findings may differ in higher risk populations with higher prevalence of preterm or small for gestational age births. (Fertil Steril® 2015;104:1484–92. ©2015 by American Society for Reproductive Medicine.)
Key Words: Preterm birth, small for gestational age, unplanned pregnancy

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Unplanned pregnancy—which includes pregnancies that are unintended, mistimed, or unwanted—is common (1, 2). More than half (51%) of all pregnancies in the United States are unplanned (1). The burden of unplanned pregnancy is highest among women ages 18 to 24 years; women who were cohabiting but not married; women whose income is below the poverty line; women with less than a high school diploma; and Black or Hispanic women (1). Unplanned pregnancies that result in live births (60% of unplanned pregnancies and 40% of all births) (1–3) have been associated with a variety of adverse maternal and fetal outcomes including delayed prenatal care, increased physical violence during pregnancy, depression, reduced breastfeeding, decreased interpregnancy intervals, lower likelihood of advanced educational

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attainment, and higher likelihood of behavioral issues for children from unplanned pregnancies (4–7).

Whether unplanned pregnancy is associated with preterm birth and/or delivery of a small for gestational age (SGA) or low birth weight infant is not clear. Although there is support for an association between unplanned pregnancy and either preterm birth (7–17), SGA, or low birth weight (3, 10, 11, 13, 14,17–22), not all studies agree (15,23–27). More clearly understanding risk factors for preterm and SGA births is a public health priority.

Preterm birth, defined as a live birth before 37 completed weeks' gestation, is the leading cause of perinatal morbidity and mortality in developed countries (28). In fact, more infants (35%) die from preterm-related problems, including low birth weight, than from any other single cause in the United States (29). Preterm birth also significantly increases the risk of cerebral palsy, vision impairment, and cognitive or hearing impairment (30).

In 2012, approximately 1 in 9 infants (11.6% of live births) was born preterm in the United States (31). The disparity in demographic distribution of preterm birth mirrors the pattern for unplanned pregnancy. The U.S. rate of preterm birth is highest for non-Hispanic black infants (16.8%), followed by Native Americans (13.6%), Hispanics (11.7%), whites (10.5%) and Asians (10.3%) (31, 32). Preterm birth is highest among women with a history of preterm birth; women younger than 18 or older than 40 years of age; women with income below the poverty line; women with less than a high school diploma; and women with increased stress during pregnancy (31, 32). Birth weight is another important predictor of infant health, and SGA may be associated with intrauterine fetal demise and neonatal morbidity and mortality (31, 33). Studies that explore the impact of pregnancy planning and timing on birth outcomes are vulnerable to false associations if they do not take these critical socioeconomic and demographic factors into consideration.

We sought to gain a better understanding of the relationship between unplanned or poorly timed pregnancy and preterm or SGA birth, and variables (e.g., depression, anxiety, stress, social support) that affect this relationship. We hypothesized that women with unplanned or poorly timed pregnancies would have a higher risk of preterm birth and SGA. By investigating this relationship, there may be an opportunity to identify individual women with unplanned or poorly timed pregnancy and develop interventions to decrease the risk of preterm or SGA birth. And if pregnancy planning and timing are associated with preterm or SGA births, decreasing unplanned or poorly timed pregnancies could be a potentially effective strategy for decreasing the national preterm birth rate. By prospectively assessing pregnancy planning and timing before delivery, collecting outcome data from medical record abstraction instead of birth certificate data or retrospective survey responses from parents, and performing robust adjustments for multiple confounding factors including maternal demographics, medical conditions, and other risk factors, our analysis adds to and improves upon the previous literature.

MATERIALS AND METHODS

Recruitment, Enrollment, and Assessment Procedures

We performed a secondary analysis of a prospective cohort study designed to explore the associations of major depressive episodes and/or antidepressant medication use in pregnancy with adverse birth outcomes, including the risk for preterm birth (34, 35). To be eligible for the study, women had to be at least 18 years of age (16 at the Yale site), less than 18 weeks estimated gestational age with a singleton pregnancy, speak English or Spanish, and have access to a telephone. Women with insulin-dependent diabetes, plans to terminate their pregnancy, or intention to relocate were ineligible. Study size was calculated to show a twofold difference in preterm birth among women exposed to depression or antidepressant medication compared with those who were not exposed, with 85% power assuming a 5% preterm birth rate (34). Detailed study methods, including recruitment, enrollment, and assessment procedures, staff training, and quality control, have been described previously elsewhere (34, 35). Yale University School of Medicine and participating hospitals provided human subjects approval for the study.

Study staff recruited and enrolled pregnant women receiving prenatal care from 137 obstetric practices and hospital-based clinics in Connecticut and western Massachusetts between March 2005 and May 2009. Study follow-up observation continued until September 2009.

After verbal consent was obtained, staff administered a screening questionnaire to collect information on gestational age, current mood, lifetime and current mood and anxiety disorders, antidepressant treatment, and exclusion criteria. In order to meet the study's primary goal of exploring associations between major depressive episodes and/or antidepressant medication use in pregnancy with adverse birth outcomes, all women who met the above criteria and had a current or recent major depressive episode, post-traumatic stress disorder, or were undergoing antidepressant treatment, and a randomly selected comparator group with none of those characteristics were enrolled.

After enrolled participants gave written consent for interviews and medical record review, the study staff conducted an initial home interview before 18 weeks' estimated gestational age (EGA). Staff also interviewed participants by phone at 28 (±2) weeks' gestation and 8 (±4) weeks after delivery. All staff interviewers received extensive training including at least 4 days of instruction and four supervised interviews.

Exposure and Outcome Measures

At the initial interview, interviewers obtained data on demographic and potential confounding variables, including mental health outcomes (e.g., depression, posttraumatic stress disorder) perceived stress, and social support. Maternal age, race, ethnicity, education, marital status, parity, pregnancy history including previous preterm birth, tobacco use, alcohol use, other illicit drug use, and medication use was collected. The Edinburgh Postnatal Depression Scale (EPDS), the