

Unintended pregnancy and preterm birth

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Summary

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About one-third of all pregnancies that result in live births in the US are unintended. Despite the large number of these births, little is known about the outcomes of unintended pregnancies. The purpose of the current study was to evaluate the association between intendedness of pregnancy and preterm birth in a large prospective cohort of women who reported for prenatal care. Pregnant, black, low-income women were enrolled into this study at four hospital-based prenatal care clinics and one off-site hospital-affiliated prenatal clinic in Baltimore City. A self-administered questionnaire to assess demographic and psychosocial data was completed by each woman in the cohort at the time of enrolment in the study. The questionnaire contained an item to measure intendedness of the pregnancy. A total of 922 women comprised the final sample for analysis. For the analyses, intendedness was dichotomised as: intended (wanted now or sooner) vs. unintended (mistimed, unwanted or unsure). Overall, 13.7% of all births to women in the sample were preterm. In a logistic regression model, after controlling for potential confounding by clinical and behavioural predictors of preterm delivery, unintended pregnancy was significantly associated with preterm delivery (adjusted RR = 1.82, 95% confidence interval [1.08, 3.08], $P = 0.026$). In this study of a cohort of urban, clinic-attending, low-income, pregnant black women, unintended pregnancy had a statistically significant association with preterm birth. After adjustment for behavioural and clinical risks, women with unintended pregnancies had almost twice the risk of a preterm delivery as women with intended pregnancies.

Introduction

About one-third of all pregnancies that end in live births in the US and about 50% of all pregnancies are unintended.^{1–3} Unintended pregnancies can be grouped into two categories: those that were not desired at the time the woman became pregnant (mistimed) or those that were not desired then or at any time (unwanted).¹ Over one million infants are born each year as a result of unintended pregnancies and, despite this large number that end in birth, little is known about their outcomes.

One important outcome of unintended pregnancy may be preterm birth, defined as a pregnancy of < 37 weeks from the last menstrual period.⁴ Although results are not entirely consistent, research has

suggested that there may be an association between unintended pregnancy and poor pregnancy outcomes such as preterm birth.^{1,3,5–9} However, most studies of unintended pregnancy and preterm birth have been retrospective in design.^{1,7} In some surveys, for example the National Survey of Family Growth (NSFG) and the National Maternal and Infant Health Survey (NMIHS),^{10–16} women were asked more than a year after the child's birth about intention status at the time of conception. Thus, responses could be biased by the course and outcome of the pregnancy, as well as by time and other events that may have transpired during or after the pregnancy (e.g. job loss or problematic relationship with the father of the child). The length of the recall period (usually from a year or

more after the birth of the child to conception) has been identified as a source of error in the reporting of intendedness of pregnancy.¹⁷

The purpose of the current study was to evaluate the association between intendedness of pregnancy ascertained at the first prenatal visit and preterm birth in a large prospective cohort of women who reported for prenatal care and planned to continue their pregnancies to term.

Methods

Pregnant women were enrolled in this study at four hospital-based prenatal care clinics and one off-site hospital-affiliated prenatal clinic in Baltimore City. All black women aged ≥ 18 years presenting for a first prenatal visit during the two years of study enrolment (1994–95) at any of the five sites were asked to participate in the study. The women were asked by a trained research assistant to complete the study questionnaire. Fewer than 9% of those approached refused to participate. The age restriction was used in order to achieve a somewhat homogeneous study population, free of the well-documented problems of underaged childbearing.^{1,4} Also, unintended pregnancy is likely to have a different meaning for a younger adolescent still in school than for an older woman.

A self-administered questionnaire to assess demographic and psychosocial data was completed by each woman in the cohort at the time of enrolment in the study at the first prenatal visit. The questionnaire contained an item, shown in Appendix 1, to measure intendedness of the pregnancy. Responses to this item were used to classify each pregnancy as intended (the pregnancy was wanted then), mistimed (the pregnancy occurred sooner than desired) or unwanted (the pregnancy was not wanted at all). As in other research, pregnancies that were either mistimed or unwanted were classified as unintended.^{1,3,10–15} Some women replied that they were unsure of their feelings about the pregnancy and, for some analyses, 'unsure' was grouped with 'unintended', because the characteristics and outcomes of these women were very similar.¹⁸ The item that we developed uses response categories that are similar to the National Survey of Family Growth (NSFG),^{10–15} Pregnancy Risk Assessment Monitoring System (PRAMS)^{3,19} and the National Maternal and Infant Health Survey (NMIHS),¹⁶ but the time orientation was different. Our item was

administered at the first prenatal visit and inquired about intendedness at that time.

The original study cohort consisted of 1163 women. After enrolment, 181 women were excluded from the study for a variety of reasons, including lost to follow-up or lost medical records, or moving out of the study area. Severe medical or psychiatric disease, twin pregnancy or abortion were also reasons for exclusion. After these exclusions, 982 women remained in the cohort.

Approximately 94% ($n = 922$) of the 982 women had pregnancies that resulted in live births. The 60 women whose pregnancies resulted in spontaneous abortions or stillbirths were excluded from all analyses, leaving 922 women with live births in the analysis sample.

The prenatal, labour and delivery records for each woman were reviewed by two trained abstractors. Data were abstracted about the outcome of pregnancy and on maternal clinical and behavioural circumstances that might represent confounding factors. Length of gestation was ascertained by the physician using the 'best obstetric estimate', based upon a combination of dates (from last menstrual period), first fetal heart rate heard with a stethoscope, sonograms and fundus height. A length of gestation of < 37 weeks was classified as preterm using the customary definition.^{4,20}

Data were analysed using contingency tables and the chi-square statistic to evaluate the statistical significance of the association between unintended pregnancy and preterm delivery. The strength of the association between intendedness of pregnancy and preterm birth was assessed initially using the unadjusted relative risk (RR). Multiple logistic regression analysis was subsequently used to produce estimates of the RRs adjusted for potential confounding. Independent variables (other than intendedness of pregnancy) were selected for inclusion in the model if they were significantly associated with preterm birth in the bivariate analysis. The beta coefficients and standard errors were used to create 95% confidence intervals (CIs). For these analyses, intendedness was dichotomised as: intended (wanted now or sooner) vs. unintended (mistimed, unwanted or unsure).

Results

Of the 922 women in the sample, approximately one-third (303) indicated that they wanted to be pregnant now or sooner (wanted pregnancies). An additional

Table 1. Variables associated with preterm delivery (< 37 weeks gestation), Baltimore City, 1994–95

	<i>n</i>	% Preterm	Unadjusted relative risk	<i>P</i>
Alcohol use				
Yes	73	21.9	1.69	0.03
No	848	13.0		
Drug use				
Yes	147	22.4	1.85	0.003
No	771	12.1		
Smoking				
Yes	213	19.2	1.61	0.01
No	709	12.0		
Abruptio placentae				
Yes	13	61.5	4.76	0.001
No	904	12.9		
Bleeding during pregnancy				
Yes	47	44.7	3.73	0.001
No	870	12.0		
Chronic disease				
Yes	265	17.4	1.43	0.02
No	645	12.1		
Hospitalised during pregnancy				
Yes	85	56.5	6.06	0.001
No	836	9.3		
Poor weight gain (< 21 lbs)				
Yes	170	21.8	1.94	0.001
No	704	11.2		
Pre-eclampsia				
Yes	32	31.3	2.48	0.001
No	876	12.8		
Previous poor pregnancy outcome				
Yes	296	19.9	1.86	0.001
No	626	10.7		

one-third (312) reported that they wanted to become pregnant at some later time, but not currently (mistimed). Unwanted pregnancies were reported by 10.6% of the women (97), and 22.0% (201) were unsure of the intendedness of the current pregnancy. (Responses to this item were missing for nine women.)

Overall, 13.7% of all births to women in the sample were preterm. The women who characterised their pregnancies as unwanted had the highest risk of preterm outcomes (18.6%). Those women who characterised their pregnancies as mistimed (14.4%) or responded that they were unsure about the intendedness of the pregnancy (15.9%) also had a relatively high risk of preterm birth compared with those women with intended pregnancies (9.6%). Because of the similar risk of preterm birth among those with mistimed and unwanted pregnancies and those who were unsure about intendedness, these women were grouped together for subsequent analyses. Among women

who characterised their pregnancy as mistimed, unwanted or were unsure about its intendedness, 15.6% had a preterm delivery, whereas 9.6% of those who described their pregnancies as intended had a preterm delivery (unadjusted RR = 1.63; 95% CI 1.12, 2.71).

In addition to intendedness of pregnancy, in bivariate analysis, preterm delivery was significantly associated (unadjusted RR > 1.0; *P* < 0.05) with the following clinical and behavioural variables: abruptio placentae; alcohol use; bleeding during pregnancy; chronic disease (e.g. hypertension, asthma); drug use; hospitalisation during pregnancy; poor weight gain (< 21 pounds); pre-eclampsia; previous poor pregnancy outcome (stillbirth, low birthweight, preterm birth or fetal death); and smoking (Table 1).

In a logistic regression model, after controlling for confounding by the clinical and behavioural predictors of preterm delivery, intendedness of pregnancy was significantly associated with preterm delivery (adjusted RR = 1.82, 95% CI 1.08, 3.08). (Table 2).

Independent variables	Unadjusted RR	Adjusted RR [95% CI]
Intendedness of pregnancy	1.63	1.82 [1.08, 3.08]
Alcohol use	1.69	1.67 [0.74, 3.77]
Drug use	1.85	1.72 [0.83, 3.57]
Bleeding during pregnancy	3.73	4.30 [1.96, 9.44]
Chronic medical disease	1.03	1.06 [0.65, 1.74]
Hospitalisation during pregnancy	6.06	10.19 [5.83, 17.82]
Poor weight gain (< 21 lbs)	1.94	1.71 [1.01, 2.89]
Pre-eclampsia	2.48	3.40 [1.43, 8.01]
Previous poor pregnancy outcome	1.86	1.93 [1.22, 3.07]
Smoking	1.61	1.10 [0.58, 2.09]

Table 2. Logistic regression analysis using preterm delivery (< 37 weeks gestation) as dependent variable

Discussion

In this study of a cohort of low-income, urban, clinic-attending pregnant black women, unintended pregnancy had a statistically significant association with preterm birth. After adjustment for behavioural and clinical risks, women with unintended pregnancies (or who were unsure about intendedness) had almost twice the risk of a preterm delivery as women with intended pregnancies.

This study differs from many others concerned with unintended pregnancy in that the self-assessments of intendedness occurred prenatally rather than post-natally. Thus, these study findings cannot be attributed to recall bias. Our study minimised this potential source of error because the ascertainment of intendedness was made at the first prenatal visit rather than after childbirth. In our sample, 75% of the women had enrolled in prenatal care by the 21st week of pregnancy and 85% by the 24th week. Also, unlike other studies of the consequences of unintended pregnancy, our study was able to control for clinical risk factors. Many studies have controlled only for behavioural (e.g. smoking) and demographic factors.⁷⁻⁹

The women in our sample were more likely to report being unsure about intendedness than those in other samples such as the PRAMS or NSFG. This may be because the women in our study had learned fairly recently of the pregnancy, whereas those in the PRAMS and NSFG had already had their babies when asked about their intention. The longer time interval and the experience of childbirth may have resolved uncertainty among women in the PRAMS and NSFG samples.

Some suggest that unwanted pregnancies are more likely to be associated with poor outcomes than those that are mistimed.¹ However, in our sample, the risk of preterm delivery was similar for both these groups. This may reflect the prospective ascertainment of intendedness early in pregnancy in our study.

We did not assess interpregnancy interval. Short interpregnancy interval is possibly associated with unintended pregnancy.¹ Recent findings suggest that very short interpregnancy intervals (< 90 days) may be associated with an increased risk of poor pregnancy outcomes.^{1,21} However, very few women have intervals of this very short duration, so this is not likely to be a significant limitation of our study.^{21,22}

The results of this study provide reason to focus attention on the importance of providing contraception to women to help them to plan the timing of their pregnancies. Preterm birth is a major determinant of the high rate of infant mortality in the US, and is also associated with a risk of very costly medical, cognitive and later educational problems among infants and children.^{4,23-28}

Our results suggest that unintended pregnancy has a significant association with risk of preterm delivery, after adjustment for confounders. Wanted (intended) pregnancies were more likely to have favourable outcomes. The focus in the US on preventing preterm delivery through the provision of prenatal care needs to be expanded to include the provision of care to women who are not pregnant, and a reduction in those circumstances that lead to unintended pregnancy and preterm delivery. Facilitating wanted (intended) pregnancies that occur when they are desired could reduce preterm births and enhance outcomes for women and children. This should be emphasised by both health policy-makers and clinicians.

The sample of women in our study consists entirely of low-income black women. However, unintended pregnancy is clearly a significant public health problem in the US that affects large numbers of women from all sociodemographic groups: blacks and whites; married and unmarried; adolescents and older women. There are few prospective studies of unintended pregnancy and preterm birth, and the findings

reported here, while intriguing and potentially important, need to be replicated.

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Appendix 1

Questionnaire item to assess intendedness of pregnancy

Thinking about this current pregnancy, how do you feel about being pregnant? (check one)

I wanted to be pregnant sooner.

I wanted to be pregnant now.

I wanted to be pregnant later.

I did not want to be pregnant now or at any time in the future.

I am unsure how I feel.