Original Study

Teenage Pregnancy and the Influence of Paternal Involvement on Fetal Outcomes

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A B S T R A C T

Study Objective: We sought to assess the impact of paternal involvement on adverse birth outcomes in teenage mothers.
Design: Using vital records data, we generated odds ratios (OR) and 95% confidence intervals (CI) to assess the association between paternal involvement and fetal outcomes in 192,747 teenage mothers. Paternal involvement status was based on presence/absence of paternal first and/or last name on the birth certificate.
Setting: Data were obtained from vital records data from singleton births in Florida between 1998 and 2007.
Participants: The study population consisted of 192,747 teenage mothers ≤ 20 years old with live single births in the State of Florida.
Main Outcome Measures: Low birth weight, very low birth weight, preterm birth, very preterm birth, small for gestational age (SGA), neonatal death, post-neonatal death, and infant death.
Results: Risks of SGA (OR = 1.06; 95% CI: 1.03-1.10), low birth weight (OR = 1.19; 95% CI: 1.15-1.23), very low birth weight (OR = 1.53; 95% CI: 1.41-1.67), preterm birth (OR = 1.21; 95% CI: 1.17-1.25), and very preterm birth (OR = 1.49; 95% CI: 1.38-1.62) were elevated for mothers in the father-absent group. When results were stratified by race, black teenagers in the father-absent group had the highest risks of adverse birth outcomes when compared to white teenagers in the father-involved group.
Conclusions: Lack of paternal involvement is a risk factor for adverse birth outcomes among teenage mothers; risks are most pronounced among African-American teenagers. Our findings suggest that increased paternal involvement can have a positive impact on birth outcomes for teenage mothers, which may be important for decreasing the racial disparities in infant morbidities. More studies assessing the impact of greater paternal involvement on birth outcomes are needed.
Key Words: Teenage pregnancy, Paternal involvement, Social support, Infant morbidity, Preterm birth, Infant SGA, Racial disparities

Introduction

Whereas some studies have examined the effects of paternal anthropometric characteristics, occupation, education, and age on adverse birth outcomes such as preterm birth and low birthweight,[1] few have evaluated the contribution of paternal involvement during pregnancy on infant morbidity.[2–5] Though paternal involvement is difficult to measure, past studies have used marital status as a proxy indicator.[6,7] However, increasing numbers of families are composed of unwed couples,[4] with both parents involved during pregnancy as well as the subsequent upbringing of the child. Furthermore, paternal involvement varies according to the degree to which the parents are involved with one another (eg, romantically involved and cohabitating; romantically involved but living apart; not romantically involved).[5,8] Despite these nuances, the presence or absence of paternal information on the birth certificate has been shown to be a good indicator of the father's involvement.[9] As a result, in addition to marital status, more recent studies have included partial or complete lack of fathers' names or demographics on the birth certificate as an additional surrogate indicator of paternal engagement.[2,4,10,11] When both marital status and presence of paternal information on the birth certificate are considered, the risks of infant morbidity tend to decrease as the parents' relationship moves from unmarried with the father's name missing to married with the father's name included.[4,5,10] One study that used a Likert scale to assess paternal support found that better support during pregnancy—based on how often the father showed he cared about the mother, criticized her, and supported her financially—decreased the odds of preterm birth compared to mothers lacking such support.[12] The effects of low paternal involvement appear to be particularly important for African American women; several of these studies found that the risks of adverse birth outcomes associated with fathers' noninvolvement were markedly higher for African American mothers when results were stratified by race.[2,10,13]

Although previous studies have examined the impact of paternal support on adverse pregnancy outcome among teenagers combined with women ≥20 years old as one obstetric entity,[4,9,11] or focused exclusively on women ≥20 years old,[2,13] none has examined the effects of paternal involvement among teenage mothers alone. In effect, it is estimated that as many as 30% of teens will become pregnant at least once before the age of 20.[14] The rate of teen

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pregnancy is disproportionately higher among black and Hispanic teens (126 per 1000 and 127 per 1000, respectively), as compared to non-Hispanic whites (44 per 1000 births).[15] According to the Guttmacher Institute, the United States adolescent pregnancy rate is 72.9 per 1000 women aged 15-19[15]; of those, 42.5 per 1000 end in live births, 19.9 per 1000 in abortion, and 10.5 per 1000 result in miscarriage or stillbirth.[15] Additionally, teen pregnancy is associated with adverse socioeconomic and psychological influences such as poverty, limited parent-child interactions, single-parent homes, peer relationships, psychological factors, limited decision-making skills, and level of education.[16] Therefore, despite the possibility that a teen mother's own parents or family might provide some form of social support,[17] the involvement of the infant's father may be especially important for these young mothers. Accordingly, this study will use the presence or absence of fathers' names on state of Florida birth certificate records to determine the impact of paternal involvement on adverse birth outcomes in teenage mothers.

Materials and Methods

Florida Department of Health (FDOH) birth certificate records from 1998 to 2007 were used for this study, and a total of 193,512 teenage women (less than 20 years of age) with live singleton births were considered for inclusion. We excluded 387 (2.0%) women with births outside the gestational age range of 20 to 44 weeks. An additional 378 (2.0%) records were excluded because of implausible values of birth weight and date of death, yielding a total of 192,747 teenage mothers available for the study. Using presence or absence of the father's first and/or last name on the birth certificate as a surrogate measure of paternal involvement during pregnancy as previously reported and used in the literature,[2,4,10,11,13] we categorized the study population into 2 groups—father-involved and father-absent pregnancies. Father-involved pregnancies encompassed infants whose birth certificates had the father's first and/or last name listed, whereas father-absent pregnancies were those without paternal name listed. For the groups of women studied, we observed that when the father's first name was missing from the birth certificate, his last name was missing as well.

Married women are required by Florida law to list their husbands' information on the birth certificate; however, unless a paternity acknowledgment is obtained, unmarried women do not have to provide the father's information. Missing paternal information suggests limited or nonexistent partner involvement, whereas inclusion of the father's information implies a higher level of engagement.[2,4,9–11] Further, a study found a strong correlation between the proportion of fathers who were involved during the pregnancy and fathers who had their names listed on the birth certificate (87% and 90%, respectively).[8] Hence, the absence of the father's name on the birth certificate is a good marker of lack of paternal involvement for that pregnancy.

Feto-infant morbidities were the main outcomes of interest; these morbidities included low birth weight (<2500 g), very low birth weight (<1500 g), preterm birth (<37 weeks), very preterm birth (<33 weeks), small for gestational age (SGA), neonatal death (death of the newborn within the first 28 days of life), post-neonatal death (death between 28-364 days of life), and infant death (death occurring before 1 year of age). We defined SGA as less than the 10th percentile of birth weight for a given gestational age using population-based national reference curves.[18] Gestational age was calculated in weeks, whereas birth weight was measured immediately after birth and documented in grams. Gestational age was computed by taking the interval between date of last menstrual period reported by the mother at her first prenatal visit and the date of delivery. In situations in which the menstrual estimate of gestational age was inconsistent with birth weight (for example, very low birth weight at term), a clinical estimate computed by the physician was used. In addition, we constructed a composite variable defined as the occurrence of at least 1 of the following morbidity outcomes: low birth weight, very low birth weight, preterm birth, very preterm birth, and SGA.

Covariates considered in this study included: maternal age (<35 or ≥35 years), parity (nulliparous or multiparous), race (non-Hispanic black, non-Hispanic white, Hispanic, and others, which included all other races and ethnicities), marital status (married or unmarried), education (<12 or ≥12 years), cigarette smoking during pregnancy (yes or no), and adequacy of prenatal care (adequate or inadequate). Marital status was included as a covariate in order to measure the independent influence of paternal involvement on outcomes. Adequacy of prenatal care was assessed using the revised graduated index algorithm, which has been found to be more accurate than several others, especially in describing the level of prenatal care use among groups that are high risk.[19] This index assesses the adequacy of care based on the trimester prenatal care began, number of visits, and the gestational age of the infant at birth. Prepregnancy body mass index (BMI) was calculated from height and prepregnancy weight, as recorded on the birth certificate. Computation and comparison of BMI was possible only for births after February 2004, since prior to that period the information for height and prepregnancy weight was not collected on the birth certificate. The 2 groups were additionally compared with respect to the occurrence of several obstetrical complications coded as present or absent in the database (anemia, cardiac disease, type 1 diabetes, chronic hypertension, preeclampsia, eclampsia, abruptio placenta, placenta previa, and renal disease).

Baseline characteristics between father-involved and father-absent births were compared using chi-square tests for categorical variables and *t* tests for continuous variables. The risk for feto-infant morbidity outcomes in teenage mothers among the father-absent group was compared to that of the father-involved group using odds ratios and 95% confidence intervals after adjusting for baseline characteristics (demographics and pregnancy complications) in multiple logistic models. The LOGISTIC procedure in SAS, version 9.2 (SAS Institute, Inc., Cary, NC, March 17, 2008), was used to conduct all analyses. We constructed regression models and assessed goodness-of-fit of the regression models using the -2 log likelihood ratio test. We estimated