Infant birth weight relative to gestational weight gain in adolescent pregnancy: A study among sisters

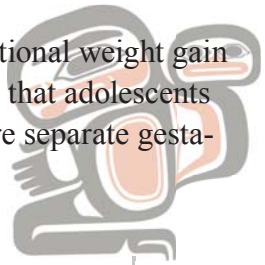
Jeanene Johnson

Objective: To examine the relationship between infant birth weight and gestational weight gain in adolescent primiparas compared to their adult sibling primiparas.

Methods: A population-based, retrospective cohort analysis was conducted using a database of maternally-linked birth certificate and hospital discharge data compiled from Washington State Vital Statistics and the Comprehensive Hospital Abstract Reporting System (CHARS). Subjects were approximately 43,000 sister pairs who gave birth from 1989-2008. For the present analysis, full biological sister pairs were identified in which one sister experienced her first pregnancy during adolescence and the other during adulthood. Data were limited to adolescent sisters aged ≤18 years at delivery and their adult sisters aged 22 to 34 years at delivery, and only primiparous women with full-term (37 to 42 weeks gestation), singleton births were included. Sister pairs were excluded if infant birth weight or gestational weight gain values were missing for either sister or if either bore an infant with a congenital malformation. In order to examine the relationship between infant birth weight and gestational weight gain, multilevel mixed-effects linear regression methods were applied. Covariates examined as potential confounders were Medicaid payer status, smoking during pregnancy, prenatal care adequacy, marital status, gestational diabetes, and preeclampsia.

Results: Data for 1,283 sister pairs were analyzed. The final model included maternal smoking and preeclampsia as covariates, both of which were negatively associated with the infant birth weight outcome (β=-136.86, $P<0.001$; and β=-100.50, $P=0.001$, respectively). A statistically significant, positive relationship was identified between infant birth weight and the age group/gestational weight gain interaction (β=7.13, $P=0.004$). Gestational weight gain alone was also positively associated with infant birth weight (β=10.51, $P<0.001$), whereas adolescent age at delivery demonstrated a negative effect on infant birth weight (β=-141.78, $P=0.001$). At low levels of gestational weight gain, infants born to adults were heavier than infants born to adolescents; however, the gestational weight gain coefficient for adolescents was greater than for adults (β=17.64 vs. 10.51, respectively), suggesting that infants born to adolescents had greater infant birth weight potential with increasing gestational weight gain.

Conclusion: The results from this analysis indicate that the infant birth weight/gestational weight gain relationship differs between adolescent mothers and their adult sisters. This suggests that adolescents and adults transfer gestational weight gain at different rates and may therefore require separate gestational weight gain recommendations.



Thesis Committee:
Jane M. Rees, PhD, MS, RD
Marcia F. Williams, PhD, MPH (Chair)

This study was supported by the US Department of Health and Human Services, Health Resources and Services Administration's Maternal and Child Health Bureau (Title V, Social Security Act), grant #T76MC00011