

Exploring the Relationships in Prenatal Weight Gain, Birth Outcomes, and Postnatal Growth up to 2 Years of Age Using a Longitudinal Cohort in Niger

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Objectives: The first 1000 days of life, from conception until a child's second birthday, is a crucial period during which life-long foundations for good health, growth, and development are established. It has been shown that poor maternal weight gain can contribute to adverse birth outcomes, such as low birth weight, small for gestational age, and prematurity, and such adverse birth outcomes can place children at greater risk for developing wasting and stunting as they age. While it has been suggested that the development of wasting and stunting may be related, the relative impact of poor birth outcomes on weight and height attainment over time is not clear. The objective of this study is to use recently collected longitudinal data to explore the inter-relationships between prenatal weight gain, birth outcomes, and postnatal risk of both wasting and stunting over time.

Methods: Using longitudinal data nested within a large randomized trial conducted in Madarounfa, Niger, we describe prenatal weight gain, the risk of adverse birth outcomes (preterm, small for gestational age, and low birthweight) and postnatal child growth (weight and length/height) up to 2 years of age. We use binomial regression to examine the relationship between prenatal weight gain and adverse birth outcomes. We use generalized estimating equations to examine the risk of wasting and stunting over time and evaluate potential effect modification of postnatal growth by birth outcomes.

Results: We followed 2796 mother-child pairs from pregnancy through 2 years of age. We found that 55.9% of the children were born preterm, 6.4% were born small for gestational weight, and 6.8% were born with low birth weight. Using longitudinal analysis, we are examining the relationship between the risk of wasting and stunting over time.

Conclusions: This analysis will provide evidence to describe the inter-relationships between prenatal weight gain, adverse birth outcomes, and risk of both wasting and stunting over time, with special attention to the inter-relationships between prenatal and postnatal growth.

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