



ECHO

Environmental influences
on Child Health Outcomes

A program supported by the NIH

Study Summary

Weight Gain During Infancy in Children Born Preterm Associated with Higher Risk of Obesity, According to New ECHO Research

Authors: Michael O’Shea, et al.

Who sponsored this study?

The Environmental influences on Child Health Outcomes (ECHO) Program, Office of the Director, National Institutes of Health supported this research.

Why was this study needed?

Infants born preterm typically have a period of poor growth in their first few months. After this stretch, they typically exhibit “catch-up” growth defined by an increase in weight z-score—a measure to classify a child’s nutritional status—during childhood and adolescence.

Prior research suggested that a “trade-off” may be associated with catch-up growth, such that individuals with more rapid weight gain during infancy have better neurodevelopmental outcomes than individuals with less weight gain. However, rapid catch-up growth during infancy has also been associated with a higher risk of becoming overweight or obese.

This study can help inform evidence-based guidelines for managing infant nutrition and growth monitoring after infants born very preterm (prior to 32 weeks of gestation) are discharged from a neonatal intensive care unit (NICU), to support rates of growth less likely to contribute to childhood overweight and obesity.

What were the study results?

In comparison to infants with low weight gain after birth, infants with very high weight gain after NICU discharge, which was experienced by 13.6% of participants, had higher body mass index (BMI) scores and a higher risk of obesity at 12-48 months.

The study team found no evidence that very high weight gain after NICU discharge was associated with better neurodevelopmental outcomes at 12 to 48 months of age. However, infants with very low weight gain after NICU discharge had lower scores on cognitive and language assessments. No significant differences were found between girls and boys.

Footnote: Results reported here are for a single study. Other or future studies may provide new information or different results. You should not make changes to your health without first consulting your healthcare professional.

What was the study's impact?

The study's findings suggest possible benefits of close monitoring of post-NICU growth and healthier feeding practices to prevent obesity, which is associated with multiple adverse health outcomes. However, as single studies rarely provide sufficient evidence to change clinical practice, the authors note that the current study should not be the sole basis for such changes.

Who was involved?

This study involved 1,400 children born before 32 weeks of gestation in hospitals in multiple states in the U.S. between 2002 and 2020. A majority of these children experienced neonatal complications—issues faced during the first 28 days of life—the most common of which was neonatal chronic lung disease.

What happened during the study?

After birth, the participants were followed for 1 to 4 years, at which point their BMI and neurodevelopmental outcomes were assessed. Data about each of the participants were shared, with appropriate informed consent from a parent or guardian, with the ECHO Cohort Consortium. This allowed for analyses of relationships between weight gain following NICU discharge and neurodevelopmental outcomes and BMI at 1 to 4 years of age.

What happens next?

Future studies are needed to evaluate the relationship between the pace of weight gain during early childhood, long-term developmental outcomes, and changes in children's BMI. This study focused on weight gain among infants born very preterm after discharge from the NICU. Additional studies are needed to observe the effects of different rates of catch-up growth on infants born closer to term.

Where can I learn more?

Access the full journal article, titled "Association of Growth During Infancy with Neurodevelopment and Obesity in Children Born Very Preterm: The Environmental Influences on Child Health Outcomes Cohort," in the [Journal of Pediatrics](#).

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