

Evaluating the impact of early growth patterns on long-term health outcomes for large for gestational age infants

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Introduction:

Large for gestational age (LGA) infants face immediate and long-term health outcomes. Emerging evidence suggests that LGA infants may exhibit a distinct growth pattern characterized by decelerated growth in early life, also termed catch-down growth. Although initial findings hint at a protective effect of catch-down growth against health complications associated with being LGA, the precise nature of this relationship and its implications for future health outcomes remain poorly understood.

Objective:

This retrospective study evaluates the impact of growth patterns of LGA infants and its correlation to obesity and long-term metabolic outcomes.

Methods:

This cohort study examines patterns of infants born large for gestational age (LGA) and their association with long-term health outcomes. The study includes singleton LGA infants (birth weight ≥ 90 th percentile for gestational age) born at Southern California Kaiser Medical Centers between 01/01/2009 and 12/31/2013. Exclusion criteria include congenital anomalies, multiple pregnancies, post-term births, and missing growth data. The study endpoint of 12/31/2024 allows for data collection on patients up to 15 years of age. The sample study initially included 18,399 LGA infants, with 8,642 excluded due to missing data, yielding the final cohort.

Growth patterns were categorized based on standardized z-score changes from birth to 6 months: catch-up growth ($>+0.67$), catch-down growth (<-0.67), and stable growth with no up/down (-0.67 to $+0.67$). Long-term outcomes, including obesity and metabolic markers (lipid levels, blood pressure, and glucose), were collected.

Results:

Catch-up growth is associated with increased odds of obesity at 5 and 10 years, with a stronger association at 5 years. Children who experienced catch-up growth are 12x more likely to be obese at 5 years old compared to those who had catch-down growth.

Our initial findings emphasize the importance of monitoring growth patterns in early childhood to understand the potential obesity risk later in life.

Odds Ratio Comparison for Obesity in Term Large-for-Gestational-Age Infants by Weight Growth Pattern	
Obesity at 5 Years Old	
Catch-up vs Catch-down	OR=12.41(10.8;14.2)
Catch-up vs No Up/Down	OR=4.79(4.42;5.16)
Catch-down vs No Up/Down	OR=0.38(0.33;0.44)
Obesity at 10 Years Old	
Catch-up vs Catch-down	OR=3.93(3.60;4.26)
Catch-up vs No Up/Down	OR=2.50(2.35;2.65)
Catch-down vs No Up/Down	OR=0.64(0.58;0.70)

We further aim to correlate these growth patterns to metabolic markers during study period. We aim to identify patients who meet criteria for metabolic syndrome by ages 10 and 15, using established pediatric definitions (DeBoer, 2019). Results of secondary outcomes to be completed by 4/2025.

Reference

DeBoer, M. D. (2019). Assessing and managing the metabolic syndrome in children and adolescents. *Nutrients*, *11*(8), 1788. <https://doi.org/10.3390/nu11081788>



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