

The Relationship Between IGF-I and -II Concentrations and Body Composition at Birth and Over the First 2 Months

Background

- Rapid weight gain during the early stages of life increases the future risk of many conditions, including obesity and cardiovascular disease.¹ The ability to predict such rapid weight gain could prove clinically relevant.
- The hormones insulin-like growth factor (IGF)-I and -II are involved in regulating fetal and postnatal growth. Some data suggest that they regulate different components of weight: fat mass versus lean mass.²
- The relationships of IGF-I and -II to body composition at birth and during early life have not been fully explored.
- **Objective:** The investigators of this study assessed whether IGF-I and -II concentrations at birth correspond with 1) body composition at birth and 2) changes in body composition during the first 2 months of life.

Methods

- The study population included infants enrolled in the Cork BASELINE Birth Cohort Study (Ireland, enrollment from August 2008 to August 2011).
 - All infants were healthy and born between 37 and 42 weeks of gestation to first-time, low-risk mothers with singleton pregnancies.
- At birth, umbilical cord specimens were taken. IGF-I and -II concentrations were measured with a previously developed liquid chromatography/mass spectrometry assay at Quest Diagnostics.³
- Air displacement plethysmography was conducted at birth and at 2 months to determine body density. Fat mass (FM) and fat-free mass (FFM) were calculated and corrected for body length (L).
- Linear regression analyses were conducted to examine the relationship of IGF-I and IGF-II concentration Z-scores with body composition Z-scores, which were previously determined.^{3,4}

Results

- Cord blood specimens and body composition measurements were available for 601 infants.
- At birth:
 - Higher IGF-I concentrations were associated with greater FM/L³ ($R^2 = 0.05$, $P < 0.001$) and FFM/L² ($R^2 = 0.04$, $P < 0.001$) Z-scores, but the concentrations accounted for little variance in body composition.
 - IGF-II concentrations were not associated with FM/L³ Z-scores, but higher IGF-II Z-scores were associated with greater FFM/L² Z-scores ($R^2 = 0.01$, $P = 0.02$).
- Birth IGF-I and -II concentrations were not associated with body composition at 2 months.
- However, lower IGF-I concentrations at birth were weakly associated with increases in body composition from birth to 2 months: FM/L³ ($R^2 = 0.05$, $P < 0.001$) and FFM/L² ($R^2 = 0.03$, $P < 0.001$).

Conclusions

- IGF-I levels at birth correlated with fat and lean mass at birth but accounted for a small amount of variance.
- IGF-I concentrations were inversely correlated with the changes in body composition that occurred in the first 2 months of life.

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Webpage

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