

Correlation of Insulin-Like Growth Factor-I and -II Concentrations at Birth Measured by Mass Spectrometry and Growth from Birth to Two Months

Background

- Insulin-like growth factor (IGF)-I and IGF-II contribute to regulating fetal and postnatal growth.¹
- Immunoassays that measure IGF-I and IGF-II concentrations can give inaccurate results because of interference from IGF-binding proteins.²
- To overcome this limitation, a liquid chromatography/mass spectrometry (LCMS) assay was previously developed using isotopically labeled IGF-I as a reference.^{3,4}
- **Objective:** The objective of this study was to use this LCMS assay to measure IGF-I and IGF-II concentrations at birth and evaluate their association with anthropometric measurements at birth and at 2 months.

Methods

- The previously developed LCMS assay^{3,4} was used to measure IGF-I and IGF-II concentrations of 1,100 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 low-risk mothers with singleton pregnancies.
 - Blood samples were taken from umbilical cord blood at birth.
- Sex-specific IGF-I and IGF-II reference curves were generated with Box-Cox transformation, and then IGF-I and IGF-II concentrations were converted to age- and sex-specific Z-scores.
- Anthropometric measurements of weight, length, and occipitofrontal head circumference (OFC) were taken at birth and at 2 months by standard methods, and Z-scores were determined from reference charts.
- Linear regression analysis was conducted to examine the relationship of IGF-I and IGF-II Z-scores with the anthropometric measurements.

Results

- At birth, the average IGF-I concentration was 52.5 ng/mL (males 48.5 ng/mL, females 56.7 ng/mL) and average IGF-II concentration was 424.3 ng/mL (males 420.8 ng/mL, females 428.0 ng/mL).
- IGF-I concentration at birth was associated with weight, length, and OFC. IGF-II concentration at birth was also associated with these anthropometric measurements, but the association was weaker.
- IGF-I concentration at birth was associated with weight and length at 2 months, whereas IGF-II concentration at birth was only associated with length at 2 months.

Conclusions

- Concentrations of IGF-I and IGF-II at birth, as determined by an LCMS assay, are associated with weight, length, and OFC at birth, but with weight and length (IGF-I) or only length (IGF-II) at 2 months.
- These results corroborate those of other studies that used different types of assays; they may also serve as a reference for LCMS assays that measure IGF-I and IGF-II at birth.

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