Peak growth velocity in infancy is positively associated with blood pressure in school-aged children.

Abstract:
Rapid growth velocity in early life may be a risk factor for obesity, elevated blood pressure, and adverse metabolic markers in childhood, but results are not consistent. We analysed the association between peak growth velocity during the first 2 years of life and blood pressure, fasting glucose and insulin at 10 years of age. A prospective German birth cohort (LISAplus) provided data on growth, blood pressure, glucose, and insulin for 1127 children up to the age of 10 years. All children had a birth weight of at least 2500 g. Growth was modelled using nonlinear mixed-effect Reed1 models. Associations between peak growth velocities and metabolic outcomes were calculated with linear regression models. Potential confounders were sequentially adjusted for. Higher peak height velocity (PHV) and peak weight velocity (PWV) in infancy were associated with significant increase in systolic blood pressure (SBP) and diastolic blood pressure (DBP) in children at 10 years. For each 10.2 cm/year [2 standard deviation (SD)] increase in PHV, SBP increased by 2.94 mmHg [95% confidence interval
(CI) 1.34, 4.54] after adjustment for potential confounders including birth weight and body mass index. A 5.1 kg/year (2 SD) higher PWV was associated with a 2.13 mmHg (95% CI 0.51, 3.74) increase in SBP and a 1.91 mmHg (95% CI 0.52, 3.30) increase in DBP. No consistent associations were found between PHV or PWV and the Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) index after multiple adjustments. Blood pressure and metabolic outcomes at school age may be associated with growth patterns in early life, regardless of relative weight during school age.