

Relationship of Body Mass Index Rebound Age and Adverse Cardiovascular Risk Factors in Children

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Purpose: In early childhood BMI reaches a nadir, the BMI rebound, before increasing through later childhood, adolescence, and adulthood. While earlier age of BMI rebound is associated with obesity and obesity-related disease, it is unknown if the timing of BMI rebound is associated with the presence of adverse cardiovascular risk factors in childhood. The aim of this study was to determine if timing of Body Mass Index (BMI) rebound is associated with the presence of adverse cardiovascular risk factors in children at age 7 years. **Methods:** This analysis was performed on data obtained from children participating in a prospective cohort study. BMI values were recorded every four months for four years for each child. At age 7 years the following variables were obtained: systolic and diastolic blood pressure, serum insulin, leptin, lipid profiles, and echocardiographic assessment of left ventricular and left atrial function and geometry. The cohort was divided into three groups based on age of BMI rebound: 1) early BMI rebound age (below the 25th percentile), 2) middle BMI rebound age (between the 25th and 75th percentiles), and 3) late BMI rebound age (above the 75th percentile). **Results:** Mean early and late BMI rebound ages were 4.4 and 6.6 years for boys, and 4.2 and 5.7 years for girls respectively. In both genders, earlier age of BMI rebound was associated with higher BMI and systolic and diastolic blood pressures, higher serum insulin and leptin levels, and higher left ventricular mass and left atrial size at 7 years of age. **Conclusions:** Earlier age of BMI rebound is associated with adverse cardiovascular changes including higher blood pressure, elevated insulin and leptin levels, and left ventricular hypertrophy and left atrial dilatation. This study supports the clinical monitoring of cardiovascular risk factors in children who demonstrate early age of BMI rebound in order to manage and prevent cardiovascular disease.