Associations between BMI and the FTO Gene Are Age Dependent: Results from the GINI and LISA Birth Cohort Studies up to Age 6 Years

Abstract:

Objective: The association between polymorphisms in intron 1 of the fat mass and obesity associated gene (FTO) and obesity-related traits is one of the most robust associations reported for complex traits and is established both in adults and children. However, little is known about the longitudinal dynamics of these polymorphisms on body mass index (BMI), overweight, and obesity.

Methods: This study is based on the 2,732 full-term neonates of the German GINI-plus and LISA-plus birth cohorts, for whom genotyping data on the *Both authors contributed equally to this paper **For list of study group members see acknowledgement section FTO variants rs1558902 (TA) or rs9935401 (GA) were available. Children were followed from birth up to age 6 years. Up to 9 anthropometric measurements of BMI were obtained. Fractional-Polynomial-Generalized Estimation-Equation modeling was used to assess developmental trends and their potential dependence on genotype status.

Results: We observed no evidence for BMI differences between genotypes of both variants for the first 3 years of life. However, from age 3 years onwards, we noted a higher BMI for the homozygous minor alleles carriers in comparison to the other
two genotype groups. However, evidence for statistical significance was reached from the age of 4 years onwards. Conclusions: This is one of the first studies investigating in detail the development of BMI depending on FTO genotype between birth and the age of 6 years in a birth cohort not selected for the phenotype studied. We observed that the association between BMI and FTO genotype evolves gradually and becomes descriptively detectable from the age of 3 years onwards.

Stichworte:
FTO; BMI; Longitudinal; GINI study; LISA study; Birth cohort; Kompetenznetz Adipositas; NGFNplus; MCHEALTH

Zeitschriftentitel:
Obesity Facts

Jahr:
2010

Band:
3

Heft / Issue:
3

Seiten:
3

Volltext / DOI:
http://doi.org/10.1159/000314612

Verlag / Institution:
S. Karger GmbH

Verlagsort:
Freiburg, Germany

Print-ISSN:
1662-4033

E-ISSN:
1662-4033

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Occurences:
- Kollektionen > Open Access Publikationen > 2010
- Kollektionen > Open Access Publikationen > Verlage > Karger

entries: