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Breastfeeding modulates the *PPARG* Pro12Ala polymorphism's influence on BMI of adolescents

The HELENA-Cross Sectional Study

by

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Objectives: Peroxysome proliferator-activated receptor gamma (PPARG) plays a critical role in energy storage. In addition, the *PPARG* Pro12Ala polymorphism has been associated with higher BMI in adulthood (1). Moreover, the association between weight and *PPARG* variants can be influenced by environmental factors like early growth and dietary fat (2), and as recently shown, by breastfeeding in young children (3). Our objective was to assess (i) the possible influence of the *PPARG* Pro12Ala polymorphism on BMI in adolescents and (ii) the modulating effect of breastfeeding on this phenotype.

Methods: Breastfeeding information was obtained retrospectively by a parental questionnaire from 1172 subjects from the HELENA-Cross Sectional Study (CSS) who were genotyped for the *PPARG* Pro12Ala polymorphism. BMI, Tanner status, age, birth weight and socio economic status assessed by the education level of the mother were used in the multivariate analyses.

Results: No significant associations were found between BMI, skin fold thicknesses, circumferences, and body fat percentage and the Pro12Ala polymorphism. When introducing breastfeeding in the model, a significant association was found between BMI and the *PPARG* polymorphism. Indeed, Ala12 allele carriers had lower BMI (delta BMI =-1.77 kg/m², $p < 0.01$) when they had been breastfed than Ala12 carriers who had not been breastfed. This association remained significant after adjustment for age, gender, center and maternal education level.

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Conclusion: Breastfeeding seems to counterbalance the deleterious effect of the *PPARG* Pro12Ala polymorphism on BMI in adolescents.

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