

ORIGINAL RESEARCH COMMUNICATION

# Effect of the melanocortin-3 receptor C17A and G241A variants on weight loss in childhood obesity<sup>1,2,3</sup>

Nicola Santoro, Laura Perrone, Grazia Cirillo, Paolo Raimondo, Alessandra Amato, Carmine Brienza and Emanuele Miraglia del Giudice

<sup>1</sup> From the Department of Pediatrics "F Fede," Seconda Università degli Studi di Napoli, Napoli, Italy

**Background:** The central melanocortin system is critical for the long-term regulation of energy homeostasis. Melanocortin-3 receptor (*MC3R*) knock-out mice, despite being hypophagic, have increased fat mass and higher feed efficiency than do their wild-type littermates.

**Objective:** The aim was to evaluate whether, in childhood obesity, *MC3R* variants are associated with changes in fatness reduction as a consequence of a weight-reduction program.

**Design:** Molecular screening of the *MC3R* coding region in 184 obese children, 77 girls and 107 boys [ $\bar{x}$  ( $\pm$ SEM) body mass index (BMI; in kg/m<sup>2</sup>) z score:  $3.3 \pm 2.3$ ; age  $9.2 \pm 2$  y], was performed. BMI was evaluated at baseline and after 6 and 12 mo of the weight loss program.

**Results:** No new mutations were found. Two previously described polymorphisms, C17A (Thr6Lys) and G241A (Val81Ile), were observed in 20 patients in almost complete linkage disequilibrium. No significant differences in BMI z scores were observed at baseline of the weight-loss program between the genotypes; however, at follow-up, heterozygotes showed a significantly higher BMI z score ( $P = 0.03$ ). When the patients were divided according to the amount of weight lost, a higher prevalence of heterozygotes was observed among subjects who lowered their BMI z score  $<1.5$  ( $P = 0.03$ ).

**Conclusion:** These results suggest a gene-diet interaction between the *MC3R* C17A and G241A variants and a weight loss program for the ability to lose weight in childhood obesity.

**Key Words:** *MC3R* gene • polymorphism • childhood obesity • weight loss • BMI z score

## This Article

- ▶ [Full Text](#)
- ▶ [Full Text \(PDF\)](#)
- ▶ [Purchase Article](#)
- ▶ [View Shopping Cart](#)
- ▶ [Alert me when this article is cited](#)
- ▶ [Alert me if a correction is posted](#)
- ▶ [Citation Map](#)

## Services

- ▶ [Similar articles in this journal](#)
- ▶ [Similar articles in PubMed](#)
- ▶ [Alert me to new issues of the journal](#)
- ▶ [Download to citation manager](#)
- ▶ [Get Permissions](#)

## Citing Articles

- ▶ [Citing Articles via Google Scholar](#)

## Google Scholar

- ▶ [Articles by Santoro, N.](#)
- ▶ [Articles by del Giudice, E. M.](#)
- ▶ [Search for Related Content](#)

## PubMed

- ▶ [PubMed Citation](#)
- ▶ [Articles by Santoro, N.](#)
- ▶ [Articles by del Giudice, E. M.](#)

## Agricola

- ▶ [Articles by Santoro, N.](#)
- ▶ [Articles by del Giudice, E. M.](#)