Changes in plasma levels of gherlin, leptin, and other hormonal and metabolic parameters following standardized breakfast, lunch, and physical exercise before and after a multidisciplinary weight-reduction intervention in obese adolescents.

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Objective: to investigate in severely obese adolescents the effects of a 3-week multidisciplinary weight-reduction intervention involving moderate energy restriction, individualized physical activity and behavior therapy on the response of some hormonal and metabolic parameters to meals and exercise.

Design: clinical longitudinal study on in-patients in a specialized institution.

Subjects: a total of 20 obese adolescents (10 boys and 10 girls) aged 10-17 yr [body mass index (BMI) 37.7±6.1 kg/m^2; fat mass (FM): 44.8±13.2 kg].

Measurements: the changes in plasma concentration of leptin, ghrelin, GH, IGF-I, insulin, glucose, and non-esterified fatty acids (NEFA) in response to standardized meals and exercise bouts were measured before and after the weight-reduction intervention. At the same times, body composition was assessed by bioelectrical impedance as well as appetite sensations using a visual analog scale.

Results: at the end of the intervention, the adolescent have lost body weight and FM (expressed both in kg and %) (p<0.05), without any significant fat-free mass loss (in % terms). In response to both meals and exercise, after the 3-week intervention, plasma leptin concentration decreased significantly (p<0.05), whereas the other hormones (insulin, ghrelin, GH and IGF-I) and metabolic parameters (glucose and NEFA) did not change. Interestingly, appetite was not affected by the intervention.

Conclusion: this 3-week multidisciplinary intervention in obese adolescents induced a significant body weight loss with beneficial changes in body composition. However, despite there being no change in metabolic parameters and ghrelin in response to meals and exercise after the intervention, plasma concentrations of leptin were decreased. The failure of ghrelin levels to increase by this approach might explain the good control of appetite observed at the end of the study.