The influence of insulin resistance on weight loss in obese pre-pubertal children

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Objectives: Childhood obesity has reached epidemic proportions and is associated with several metabolic and cardiovascular complications. Obesity-related insulin resistance (IR) has been demonstrated to be one the main causes for the development of these complications already in youth. **Methods**: The aim of our study was to evaluate whether the degree of IR influences weight loss during a weight management program. We recruited 65 pre-pubertal Caucasian children (age mean ± SD: 8.7 ± 1.9years), affected by severe obesity (BMI > 97th percentile). At baseline (T0), all children underwent anthropometric measurements, assessment of blood pressure, plasma lipids and fasting insulin and glucose. Homeostasis model assessment of IR (HOMA-IR) was calculated and patients were divided into two groups: group A HOMA-IR > 97th percentile (n = 38) and group B HOMA-IR < 97th percentile (n = 27)[1]. Children were encouraged to follow a hypocaloric diet for the subsequent 6 months (T6) and assessed again at the end of this period. Differences between and within the groups were analyzed by unpaired and paired t-tests respectively. Associations between variables were assessed by regression analysis. **Results**: At baseline there were no differences in terms of age, gender, SDs-BMI, WHR and lipid levels between the two groups; whereas diastolic blood pressure was significantly higher in group A (P = 0.01). The change in SDS-BMI between T6 and T0 was significantly different between group A and group B (0.04 ± 0.11 vs. 0.11 ± 0.12; P = 0.004). In particular, whereas in group A there was not significant change in SDS-BMI between T6 and T0 (2.28 ± 0.44 vs. 2.32 ± 0.38; P = 0.09), a significant improvement in SDS-BMI was found in group B (2.12 ± 0.3 vs. 2.24 ± 0.28;P = 0.001). In a multiple regression, HOMA-IR at baseline was an independent predictor of changes in SDS-BMI (b = 0.50; P < 0.001; R^2=0.40), after adjusting for age, gender, and BMI at baseline. **Conclusions**: In conclusion, this study shows that IR significantly influences weight loss during a weight management program. In particular, a higher degree of IR is associated with a resistance in weight loss, thus suggesting that obese insulin-resistant children might need a stricter program to obtain effective results.

Reference:

1. Capanna R, Masuccio F, Giannini C, Chiarelli F, Mohn A. Validation of percentiles for insulin sensitivity indexes in healthy paediatric subjects: HOMA-IR AND WBISI. Pediatr Diabetes 2007; ISPAD 2007, Berlino