Impact of percent body fat on oral glucose tolerance testing: a cross-sectional study in 1512 obese children.

G. Bedogni, A. Gastaldelli, F. Agosti, A. De Col, N. Marazzi, G. Mazzilli, A. Saezza, A. Sartorio

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Background: Although an association between insulin resistance (IR) and body adiposity has been reported in obese children, this relationship has not been studied as thoroughly as in adults.

Aim: We evaluated the association between oral glucose tolerance testing (OGTT) and percent body fat (PBF) in a sample of 1512 obese children followed at a Pediatric Obesity Clinic.

Subjects and methods: Six hundred and twenty-eight male and 884 female obese children aged 6 to 18 yr were consecutively enrolled into the study. OGTT was performed with administration of 1.75 glucose per kg of body weight (up to 75 g). PBF was estimated through bioelectrical impedance analysis (BIA) using a population-specific formula recently published by our group. Multivariable median regression was used to evaluate the association between 4 outcomes [glucose area under the curve (AUC), insulin AUC, insulin sensitivity index (ISI), and insulinogenic index (IGI)] and gender, age or pubertal status and PBF.

Results: Median PBF was 52% (range 26 to 70%). After correction for age and gender, a 10% increase of PBF was associated with a decrease of -0.50 [95% confidence interval (CI): -0.65 to -0.35] units of ISI and an increase of 0.15 units of IGI (95%CI 0.07 to 0.24).

Conclusions: In obese children, PBF is inversely associated with IR and directly associated to β-cell response as detected by OGTT.