

Relationship between glucose metabolism and non-alcoholic fatty liver disease severity in morbidly obese women.

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Background: Non-alcoholic fatty liver disease (NAFLD) is an independent predictor of type 2 diabetes mellitus (T2DM). Insulin resistance and beta-cell dysfunction are involved in the pathogenesis of T2DM. Insulin resistance is associated with NAFLD but little is known about beta-cell dysfunction and NAFLD.

Aim: We tested whether NAFLD severity is associated with insulin sensitivity and beta-cell function in morbidly obese women.

Subjects and methods: We studied 61 Caucasian women aged 18-60 years without T2DM and with a body mass index ranging from 35.3 to 48.8 kg/m². The insulin sensitivity index (ISI) and the disposition index (DI) from oral glucose tolerance testing were used as measures of insulin sensitivity and beta-cell function, respectively. Fat was measured by dual-energy X-ray absorptiometry. Fatty liver was diagnosed by ultrasonography and ordinaly coded as 0 = none, 1 = light, 2 = moderate, 3 = severe. Proportional-odds logistic regression was used to evaluate the association of NAFLD severity with log_eISI and log_eDI with and without correction for total and truncal fat.

Results: The odds of more severe vs. less severe NAFLD decreased for increasing log_eISI [odds ratio (OR) 0.40, 95% CI 0.19-0.84, p<0.05] and log_eDI (OR 0.80, 95% CI 0.69-0.92, p<0.01). Neither total nor truncal fat had any effect on these associations.

Conclusion: In morbidly obese women, NAFLD severity is inversely associated with insulin sensitivity and beta-cell function. The association of NAFLD severity with beta-cell dysfunction is stronger than that with insulin resistance.

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