Nonalcoholic fatty liver is not associated with the relationship between insulin secretion and insulin sensitivity in obese children: matched case-control study.

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Background: No study so far has evaluated the relationship between insulin secretion (ISEC) and insulin sensitivity (ISEN) in pediatric nonalcoholic fatty liver disease (NAFLD). We evaluated the relationship between ISEC and ISEN in young obese patients with and without NAFLD.

Methods: We matched 401 $NAFLD^+$ and 595 $NAFLD^-$ children by sex (same), age (≤1 year), pubertal status (same), and body mass index (BMI; ≤0.05 standard deviation scores) using coarsened exact matching. The insulinogenic index and the ratio between the incremental areas under the curve of insulin and glucose were used as indices of ISEC. The quantitative ISEN check index, the oral glucose ISEN index, the Stumvoll index, and the Matsuda ISEN index were used as indices of ISEN. The association of NAFLD with the relationship between ISEC (response) and ISEN (predictor) was evaluated using median regression.

Results: The NAFLD·ISEN interaction was not significant in any regression model, implying commons slopes for $NAFLD^+$ and $NAFLD^-$ children. When such interaction was removed from the models, the NAFLD term was not significant, implying commons intercepts for $NAFLD^+$ and $NAFLD^-$ children.

Conclusion: NAFLD is not associated with the relationship between ISEN and ISEC in young obese children strictly matched for sex, age, pubertal status, and BMI.