

Screening for Type 2 Diabetes in Obese Youth

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OBJECTIVE: To assess available blood tests as potential screening tools for impaired glucose tolerance (IGT) and type 2 diabetes mellitus (T2DM).

METHODS: We studied 468 **obese** (BMI mean: 34.4 kg/m²) children, including a subgroup with serum fasting insulin levels of >15 µIU/mL. Fasting laboratory tests included measurements of serum glucose and insulin, hemoglobin A1c (HbA1c), and 1,5-anhydroglucitol (insulin-resistant subgroup only) levels. An oral glucose-tolerance test was performed on each patient, and 2-hour postload serum glucose and insulin levels were obtained. Fasting blood glucose (BG), Homeostasis Model of Assessment for Insulin Resistance (HOMA-IR), HbA1c, and 1,5-anhydroglucitol values were used as predictors for exceeding various 2-hour BG cut-offs. Receiver operator characteristic curves were fitted to determine area-under-the-curve values as measures of screening efficacy.

RESULTS: In the insulin-resistant subgroup, 3 (2%) patients had T2DM and 23 (12%) had IGT. Optimal sensitivity and specificity to detect T2DM were, respectively, 99% and 96% at HbA1c \geq 6.0%, and 96% and 88% at 1,5-anhydroglucitol < 17.0 µg/mL, with lower values for fasting BG and the HOMA-IR. In the entire study group, 9 (2%) patients had T2DM and 44 (9%) had IGT. Optimal sensitivity and specificity to detect T2DM were, respectively, 86% and 85% at HbA1c levels of 5.7%, 88%, and 93% at a fasting BG level of 104 mg/dL, and 62% and 70% at an HOMA-IR of 7.9.

CONCLUSIONS: HbA1c, 1,5-anhydroglucitol, and fasting BG levels are good predictors of T2DM in **obese** children, whereas HOMA-IR values are not. HbA1c and 1,5-anhydroglucitol are excellent predictors of T2DM in insulin-resistant **obese** children.