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Use of HbA1C testing to diagnose pre-diabetes in high risk overweight and obese children: A comparison with fasting glucose and HOMA-IR

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Objective: This study aimed to compare the discriminating power of HbA1C with other Pre-diabetes diagnostic tests specifically in high-risk overweight and obese African American children.

Research Design and Methods: A cross-sectional analysis was performed on a sample of 172 children (70 boys, 102 girls) aged 9-11 years with BMI's above the 85th percentile. Fasting glucose, insulin and HbA1C were analyzed from the plasma samples.

Results: Of the 172 participants included in this analysis, 21 (12.2%) had HbA1C concentrations above the cut-off of 5.7 used to identify pre-diabetes. None (0%) of these 21 participants, however, were observed to have a glucose concentration above the pre-diabetes cut-off of 110 mg/dl, and only 13 of 21 participants had HOMA-IR above the pre-diabetes cut-off of 2.5. When compared to the previously identified glucose cut-off of 110 mg/dl and HOMA-IR cut-off of 2.5 for pre-diabetes, HbA1C showed high specificity (88 and 93%, respectively) but very low sensitivity (0 and 21%, respectively). Glucose, insulin and HOMA-IR were significantly interrelated, but HbA1C was not significantly correlated with these biochemical pre-diabetes assessment variables, nor with anthropometric (BMIZ and WC) risk factors.

Conclusion: Our results suggest that HbA1C had poor discrimination power to identify pre-diabetes in overweight and obese 9-11 year old African American children. Future studies are recommended to compare the feasibility, sensitivity and predictive power of different screening tests currently recommended to avoid inadequacy when screening for pre-diabetes and diabetes.

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