

Sensitivity and Specificity of the Hemoglobin A1c Test in Predicting Type 2 Diabetes in Youth

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Although the hemoglobin A1c (HbA1c) test serves as a useful predictor of diabetes in adults, the sensitivity and specificity of the test for predicting type 2 diabetes in youth is not well known. The aim of this study was to evaluate whether HbA1c maintains sensitivity and specificity when compared to the gold standard oral glucose tolerance test (OGTT) in pediatric cases. Based on comparison of fasting plasma glucose (FPG) levels and OGTT two hour plasma glucose (2-hr PG) levels to the recorded HbA1c test results, the sensitivity and specificity of the HbA1c test in children was calculated using standard methods. The study group consisted of 48 individuals considered to be at risk for diabetes based on weight status (body mass index $\geq 85^{\text{th}}$ percentile), preliminary glucose tests, or family history of type 2 diabetes. Of the 48 patients evaluated, 6 patients were diagnosed with diabetes or prediabetes based on FPG levels alone, 3 were diagnosed based on OGTT 2-hr PG levels alone, and 7 were diagnosed based on both FPG and 2-hr PG levels. Sensitivity of the HbA1c test was found to be 54% in reference to FPG levels and 90% in reference to 2-hr PG levels. Specificity of the HbA1c test was found to be 80% and 86% in reference to fasting plasma glucose levels and two hour plasma glucose levels, respectively. The HbA1c test was found to relate more closely to two hour plasma glucose levels both linearly and in terms of positive and negative test results, as can be seen in the percentages reported for sensitivity and specificity of the Hemoglobin A1c test. In conclusion, HbA1c is not a sensitive or specific screening tool for a diagnosis of type 2 diabetes in youth.

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