WHO SHOULD RETURN FOR AN ORAL GLUCOSE TOLERANCE TEST? A PROPOSED CLINICAL PATHWAY BASED ON RETROSPECTIVE ANALYSIS OF 332 CHILDREN

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Introduction

• Childhood obesity is one of the biggest public health challenges in the 21st century and the rising prevalence resulted in increasing burden of Type 2 diabetes (T2DM).
• Fasting plasma glucose or oral glucose tolerance test (OGTT) is the traditional diagnostic tool for T2D. However, fasting is required and implementation in all overweight/obese children is not practical.
• This study aimed to look for simple non-fasting parameters as predictors for abnormal OGTT and derive a clinical pathway to guide the management of these children.
• This can lessen the burden of additional medical visits for those who have low chance of abnormal OGTT, and allow medical resources to be utilised more efficiently.

Method

• Retrospective chart review on paediatric subjects with OGTT done in the Department of Paediatrics and Adolescent Medicine, Queen Mary Hospital was performed from 2012 to 2018.
• All overweight/obese subjects aged ≤ 20 years with OGTT and HbA1c tests performed were included.
• Subjects with known genetic syndrome/underlying diagnosis that affect glucose homeostasis/diagnosed T2DM were excluded.

Statistical analysis

• All statistical analyses was conducted using SPSS 22.2 statistical package.
• Continuous variables were expressed as mean ± standard deviation or median ± interquartile range depending on normality of data.
• Those with prediabetes and diabetes range of glycemic response, as defined by OGTT, were considered as a group (abnormal OGTT group) for statistical analysis.
• Receivers operating characteristic (ROC) curves and area under curve were constructed to calculate sensitivity and specificity of HbA1c cutoffs.
• A two-tailed p value < 0.05 was considered as statistically significant.

Results

• 332 subjects were included (54.2% males).
• 272 subjects (81.9%) had normal OGTT.
• 60 subjects (18.1%) had abnormal OGTT.
• Mean HbA1c level was significantly higher in abnormal OGTT group (5.6% vs 5.3%, p < 0.001).
• ALT was significantly higher in abnormal OGTT group (36 ± 32 U/L vs 26 ± 20 U/L, p = 0.008).
• Optimal cutoff of HbA1c in identifying abnormal OGTT was 5.5% (sensitivity 66.7%, specificity 71.0%, PPV 33.6%) (Figure 1).
• PPV of abnormal OGTT increased from 33.6% to 61.6% when this HbA1c cutoff was combined with positive family history of T2DM and abnormal age and sex specific ALT.
• Clinical pathway based on HbA1c, family history of T2DM and ALT was derived to stratify risk of abnormal OGTT (Figure 2).

Conclusion

• HbA1c cutoff of 5.5% offers the best combination of sensitivity and specificity in predicting abnormal OGTT when used alone.
• Such HbA1c cutoff, together with ALT level and family history of T2DM represents promising stratifying tools for abnormal OGTT in paediatric subjects with overweight/obesity.
• Further longitudinal studies are needed to assess cost-effectiveness of these screening strategies.