Background and Objective

The prevalence of type 2 diabetes (T2D) is significantly increased in pediatric population, which is affected by obesity worldwide.1 The progression of insulin resistance to T2D in obese children has been shown to be faster than in adults. Therefore, screening for T2D seems meaningful especially in high risk groups such as children and adolescents with obesity, family history of T2D, and those with clinical features of insulin resistance (hyperinsulinemia, dyslipidemia, polyol pathway syndrome, or acanthosis nigricans). The current study aimed to estimate the prevalence of prediabetes and T2D and their associated risk factors among obese and overweight high risk Egyptian children and adolescents using strip HbA1c as a screening test.

Methodology

The current cross-sectional study was conducted on 339 children and adolescents (between 5 and 18 years) at high risk for T2D recruited from Cairo University Children’s Hospital outpatient clinics over a period of 10 months. Patients with hemoglobinopathies, known T1D and children on steroid therapy were excluded. Study design was approved by Research Ethics Committee of Cairo University. Informed consents were obtained from study participants (their legal guardians). Study population was subjected to full history taking (birth weight, family history of T2D, GDM, HTN or CHD), clinical evaluation (including BP assessment, signs of insulin resistance), anthropometric measurements (BMI, waist circumference), and screened for prediabetes and T2D using strip HbA1c and OGTT. Subjects with abnormal HbA1c (defined as HbA1c >5.7%) were subjected to serum HbA1c for confirmation.

Results

The study included 156 males (46%) and 183 females (54%) with mean age of 9.5±2.84 yrs; 77% had family history of T2D (n=263) and 49% had obesity in the family. Most of these studied patients (87%) were obese, while the rest were overweight according to BMI Egyptian growth curves. 5.9% and 13.3% had HTN according to systolic and diastolic BP percentiles respectively. More than half of the patients had acanthosis, while 12.6% of females had hirsutism [Table 1].

Table (1): Demographic and clinical data of study group.

![Image](image-url)

Table (2): Different study parameters in both normal and abnormal glycemic groups as by HbA1c and OGTT.

![Image](image-url)

Figure (3): Correlation between HbA1c and OGTT.

Figure (5): Concordance and discrepancy between OGTT and HbA1c in diagnosing T2D.

Figure (4): ROC curve of HbA1c as predictor of prediabetes/diabetes. OGTT and HbA1c in diagnosing T2D.

Moderate direct significant correlation was detected between HbA1c and each of FBS (r=0.39, p<0.001) and OGTT (r=0.26, p<0.001) [Figure 3]. Significant association between age and prediabetes/T2D was found using both OGTT and HbA1c (p value of 0.03 & 0.001 respectively). [Table 3]

Table (3): Correlation between HbA1c/OGTT and age as well as anthropometry in the study group.

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Conclusion

T2D and prediabetes are common conditions in obese and overweight Egyptian children and adolescents based on OGTT. Higher prevalence was detected based on HbA1c. Strip HbA1c had high sensitivity and specificity compared to OGTT and can be used for screening for prediabetes and T2D in high risk group.

References

4.I declare I have no conflict of interest