

Progression to Type 2 Diabetes Among Adolescents with Prediabetes in an Emirati Cohort

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Background

Intermediate hyperglycaemia (HbA1c level 5.7-6.4%), or prediabetes, may be a predictor of risk for Type 2 diabetes (T2D); high fasting plasma glucose being the fifth leading risk factor. However, this is underexplored, particularly for the paediatric age group.

Aims

We have investigated the progression to T2D in Emirati adolescents (age 10-19 years) with prediabetes seen at Imperial College London Diabetes Centre (ICLDC). Remission to normal glucose tolerance (NGT) and maintained prediabetes status in the cohort were also evaluated and compared with the T2D group.

Methods

Adolescents with prediabetes were identified from the ICLDC database. Pertinent details were extracted including age, weight, BMI, fasting blood glucose (FBG), random blood glucose (RBG), and HbA1c level at prediabetes diagnosis. Data analysed using SPSS version 24 and presented as median (inter quartile range-IQR).

Results

Three thousand one hundred fifty-two adolescents (49.4 % female, 100 % Emirati) with prediabetes (age at prediabetes diagnosis 13 (10-16) years) were identified. Of this, 21 (0.67 %) progressed to T2D, 72 (2.28 %) converted to normoglycaemia (prediabetes duration not significant, $p=0.078$); and 3059 (97.05%) remained prediabetic, within 0.85 (0.24-2.40) years. Weight, BMI, FBG, RBG, and HbA1c were significantly ($p<0.05$) higher in the group which progressed to T2D compared to the groups which remitted to NGT or remained prediabetic. (Table 1)

	Parameter Values at Prediabetes Diagnosis			
Parameters	Remained Prediabetic N=3059	Progressed to T2D N=21	Remitted to NGT N=72	p-value
Weight (kg)	57.7 (39.7-79.0)	95.0 (73.8-101)	54.2 (40.7-66.6)	< 0.001
BMI (kg/m ²)	23.9 (18.2-30.6)	33.4 (29.9-35.8)	22.1 (17.7-25.5)	< 0.001
FBG (mmol/L)	5.7 (5.4-5.9)	5.9 (5.7-6.5)	5.6 (5.2-5.9)	0.036
RBG (mmol/L)	5.7 (5.4-5.9)	6.3 (5.3-7.1)	5.6 (5.3-6.0)	0.028
HbA1c (%)	5.6 (5.3-5.8)	5.9 (5.7-6.6)	5.4 (5.1-5.7)	< 0.001

Table 1. Median (IQR) values of prediabetes parameters: groups which progressed to T2D, remitted to NGT, and remained prediabetic compared using Kruskal-Wallis H test.

T2D=Type 2 diabetes, NGT=normal glucose tolerance

Discussion

Results suggest that adolescents with increased weight, BMI, FBG, RBG, and HbA1c at prediabetes diagnosis are more at risk of developing T2D. This may have T2D preventive implications in the cohort, including parameter cut-off assessments for population-specific risk stratification. Stringent weight and glycaemic control monitoring in high risk adolescents may be beneficial.