

HIGHER GLYCEMIC EXCURSION OF NEWLY DIAGNOSED YOUTH-ONSET TYPE-2 DIABETES MELLITUS MAY BE RELATED TO α -CELL SECRETORY CAPACITY AND NOT TO INSULIN RESISTANCE

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Background: Youth-onset type 2 Diabetes mellitus (T2DM) often presents with high glycemic values. To see the plasma glucose and hemoglobin A1c (HbA1c) at diagnosis and their relationship with α -cell secretory capacity and insulin resistance in phenotypic T2DM of young. **Methods:** This cross-sectional study enrolled 72 newly-diagnosed youth-onset phenotypically T2DM [age range 19-29, median 27, inter-quartile range (IQR) 24-29 years; male 32 (44.4%), female 40 (55.6%)] during March-December'2022 in Endocrinology department, BSMMU. The secretory capacity of α -cell was estimated by fasting C-peptide (measured by chemiluminescence immunoassay) and insulin resistance by calculating visceral adiposity index (VAI) and serum triglyceride/high-density lipoprotein (TG/HDL) ratio. **Results:** Median HbA1c, fasting plasma glucose (FPG), and 2h plasma glucose (2h-PG) of the participants were 8.7% (IQR 6.7-11.0), 10.8 (IQR 7.1-16.3) mmol/L and 18.0 (IQR 13.1-24.3) mmol/L respectively. All glycemic values were negatively correlated to fasting C-peptide (HbA1c: $r=-0.437$, $p<0.001$; FPG: $r=-0.479$, $p<0.001$; 2h-PG: $r=-0.456$, $p<0.001$), body mass index (HbA1c: $r=-0.546$, $p<0.001$; FPG: $r=-0.550$, $p<0.001$; 2h-PG: $r=-0.505$, $p<0.001$) and waist circumference (HbA1c: $r=-0.422$, $p<0.001$; FPG: $r=-0.399$, $p=0.001$; 2h-PG: $r=-0.361$, $p=0.002$). There were no significant correlations of any glycemic values to VAI (HbA1c: $r=-0.037$, $p=0.757$; FPG: $r=0.075$, $p=0.532$; 2h-PG: $r=0.136$, $p=0.254$) or TG/HDL ratio (HbA1c: $r=0.036$, $p=0.764$; FPG: $r=0.144$, $p=0.228$; 2h-PG: $r=0.196$, $p=0.099$). In a linear regression model adjusted for VAI, each nmol reduction of C-peptide was associated with 0.49 (95%CI 0.19-0.79) rise of HbA1c% ($p=0.002$). **Conclusion:** Higher glycemic excursion at diagnosis of youth-onset T2DM is related to lower α -cells reserve and lower obesity indices but not to insulin resistance.

Keywords: Higher glycemic excursion, youth-onset Type-2 Diabetes Mellitus, α -cell secretory capacity, insulin resistance.

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