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YOUNG-ONSET TYPE 2 DIABETES FROM THE TARGET T2D STUDY COHORT IN MALAYSIA: CLINICAL CHARACTERISTICS, ASSOCIATION WITH METABOLIC CONTROL AND COMPLICATIONS

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INTRODUCTION
This study aims to describe the clinical characteristics of individuals with young-onset (age 40 years) T2D, its association with metabolic control and complications.

METHODOLOGY
The TARGET-T2D study is a cross-sectional study (December 2021-June 2022) involving T2D adults followed up at eight tertiary hospitals in Klang Valley, Malaysia. We compared the demographic, clinical characteristics, achievement of metabolic targets, and complications of the T2D individuals diagnosed before the age of 40 vs. those diagnosed at age 40 and above. The association between young-onset T2D with the achievement of HbA1c, blood pressure, and lipid targets as well as atherosclerotic cardiovascular disease (ASCVD), heart failure hospitalization, estimated glomerular filtration rate (eGFR) 30 mg/mmol), end-stage kidney disease (ESKD) and diabetic retinopathy were explored.

RESULTS
Among the 5087 individuals, 1908 (37.5%) had young-onset T2D. They were younger in age (48.6 vs. 65.3 years) but had longer disease duration (17.0 vs. 13.4 years) and a higher prevalence of family history of diabetes (82.9% vs. 71.0%) compared to those with usual onset T2D.

There was significantly higher rate of obesity (65.3% vs. 53.7%), poorer HbA1c control (8.5 + 2.0% vs. 7.9 + 1.8%) and more atherogenic lipid profile (higher low-density cholesterol [LDL-C] and triglyceride with lower high-density cholesterol levels) among the young-onset T2D individuals. The rate of achievement of HbA1c and lipid targets were thus significantly lower with 12.2% (vs. 19.5%) attained HbA1c <6.5% while 55.6% (vs. 68.2%) attained LDL-C <2.6 mmol/L. There was higher usage of insulin, SGLT-2 inhibitor and GLP-1 receptor agonist but lower usage of statin among the young-onset T2D cohort.

The young-onset T2D individuals had significantly less ASCVD (23.7% vs. 33.5%) and eGFR <60 ml/min/1.73 m^2 (22.9% vs. 34.6%) but more severe albuminuria (19.3% vs. 14.2%), ESKD (3.8% vs. 1.7%), retinopathy (39.4% vs. 24.7%), metabolic associated fatty liver disease (15.3% vs. 11.6%) and obstructive sleep apnoea (6.7% vs. 4.1%). The poorer glycaemic control along with less ASCVD and more severe renal and metabolic complications were no longer significant after adjustment of the confounders including age, diabetes duration, body mass index, smoking, HbA1c, blood pressure, lipid profile and medications. Only the poorer attainment of LDL-C <2.6 mmol/L and reduced prevalence of eGFR <60 ml/min/1.73 m^2 remained significant after adjustment.

CONCLUSION
We have a high proportion of T2D adults diagnosed at young age who were less likely to achieve target HbA1c and LDL-C compared to those with usual onset T2D, The higher burden of severe renal and metabolic complications at a young age warrants a more proactive and strategic approach in prevention or delay of the early onset diabetes in the young and to improve the attainment of metabolic targets to reduce long term cardio-metabolic complications.

KEYWORDS
young-onset, type 2 diabetes, metabolic targets, diabetes complications