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Prevalence and Association between Anti-Glutamic Acid Decarboxylase Antibody Positivity and Body Mass Index in Type 2 Diabetes Mellitus

Nur ‘Aini Eddy Warman, Nur Asmak Abdullah, Aimi Fadilah Mohamad, Fatimah Zaherah Mohamed Shah, Mohd Hazriq Awang, Nur Haziqah Baharum, Rohana Abdul Ghani

Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia

Corresponding Author email: ainieddy@gmail.com

Introduction:

Latent Autoimmune Diabetes in Youth (LADY) is a slow progressive form of autoimmune diabetes often misclassified as Type 2 Diabetes Mellitus (T2DM) due to overlapping clinical features and lack of routine autoantibody screening. Patients with LADY have poorer glycaemic control and higher cardiovascular risks. This study aimed to determine the prevalence of anti-glutamic acid decarboxylase antibodies (anti-GAD) positive among young-onset T2DM patients, and to determine its association with body mass index (BMI).

Methods:

This cross-sectional study included 164 patients aged 18-60 years diagnosed with T2DM before the age of 40. Participants were screened for anti-GAD antibodies to identify LADY cases. Clinical and biochemical parameters were assessed, including C-peptide levels. Results were presented as medians with interquartile ranges, and comparisons between groups were performed using the Mann–Whitney U test.

Results:

Anti-GAD positivity was identified in 13.4% (22/164) of the cohort. Patients with positive anti-GAD antibodies had a significantly lower weight (67.02 kg (61.42, 78.87) vs 84.2 kg (68.70, 98.45), $p < 0.001$) and a significantly lower BMI (28.5 kg/m² (24.0, 32.0) vs. 31.0 kg/m² (27.0-35.0); $p = 0.013$) compared with anti-GAD–negative patients. Anti-GAD–positive patients demonstrated lower C-peptide levels (2.4 ng/mL (1.4, 4.3) vs 1.8 ng/mL (0.7, 2.7); $p = 0.026$). There was no difference in the age, diabetes duration, HbA1c, LDL-c and triglycerides level between the 2 groups.

Conclusions:

Anti-GAD positivity was identified in 13.4% of young-onset patients initially classified T2DM, indicating that LADY represents a clinically relevant but under-recognised subgroup. Anti- GAD–positive patients had significantly lower weight and BMI, along with lower C-peptide levels, despite similar glycaemic and lipid profiles compared with antibody-negative patients. This phenotype suggests reduced endogenous insulin secretion rather than obesity-driven insulin resistance as the predominant mechanism. These findings highlight the heterogeneity of young-onset diabetes and support consideration of targeted autoantibody screening, particularly in individuals with lower BMI or atypical metabolic features.