The Relationship between Triglyceride Glucose Index and Glycemic Control in Type 2 Diabetes Mellitus

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Abstract

Background and Aim: Insulin resistance is the most important step in the pathogenesis of type 2 diabetes. Early diagnosis of insulin resistance is very important in terms of preventing diabetes and diabetes related complications. The HOMA-IR is the method used worldwide in the detection of insulin resistance. With this method, it is necessary to measure the insulin value, which is not routinely used in every laboratory. Triglyceride-Glucose Index (TGI) has recently been used as an alternative measurement method in the detection of insulin resistance. The most important feature of this measurement is that it uses fasting glucose and triglyceride values measured in routine clinical practice, and it is also a practical and inexpensive method. The aim of the present study was to investigate the relationship between TGI and glycemic control in patients with type 2 diabetes mellitus (T2DM).

Material and Methods: We retrospectively studied randomly recruited 100 patients with diabetes mellitus admitted to the Department of Internal Medicine, Faculty of Medicine, Adıyaman University between January 2022 and September 2022. Cases were divided into two groups based on their glycemic control. In general, HbA1c levels below 7% were considered good glycemic control, while levels above 7% were considered poor glycemic control. The TGI for these groups was compared along with other laboratory values. Data on cases' demographics and laboratory results were retrospectively

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obtained from hospital records. Patients age, triglyceride, LDL, HDL, total cholesterole, glucose, ALT, creatinine and HbA1c values were retrospectively recorded. The TGI index was calculated using the following equation: Fasting logarithm (ln) [fasting triglycerides (TG, mg/dL)/2 + fasting blood glucose (FBG, mg/dL).

Results: Cases with good glycemic control had a mean TGI of 4.88±0.24, whereas those with poor glycemic control had a mean TGI of 5.17±1.33. When comparing the TGI of both groups, a statistically significant difference was found between them (p-value <0.01). In ROC curve analysis, the optimal cutoff value for poor glucose control was 4.88 with a sensitivity of 47.5% and specificity of 78.3% (AUC=0.24, 95 Cl: 0.15-0.34).

Conclusion: Even though TGI levels were significantly associated with poor glycemic control, optimal cutoff values had low specificity and sensitivity. Therefore, future studies are needed in order to determine the value of TGI in screening for poor glycemic control.

Keywords: triglyceride glucose index, insulin resistance, diabetes mellitus, HbA1c