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Letter Open Access

The association between Triglyceride Glucose-Body Mass Index (TyG-BMI) and metabolic syndrome morbidity and mortality

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Dear Editor

Metabolic syndrome (MetS), also known as Syndrome X, insulin resistance syndrome, or the silent killer, is a significant public health concern worldwide due to its high prevalence and associated health risks. The most recent guidelines suggest that MetS includes obesity and at least two of the following: hypertension, impaired glucose metabolism, or elevated non-HDL cholesterol. The current definition of MetS includes the presence of obesity (waist circumference of 102 cm or more in men and 88 cm or more in women, or a BMI of 30 kg/m2 or more) along with two out of three criteria, which include high blood pressure (Blood pressure of 130/85 mmHg or higher, or taking antihypertensive medication), glucose metabolism disorder (FBS of 100 mg/dL or higher, mean HbA1C of 5.7 or higher, or use of hypoglycemic medication), and an increase in non-HDL cholesterol (atherogenic dyslipidemia) (non-HDL cholesterol of 130 mg/dL or higher, or use of blood lipid-lowering medication).[1,2]

The association between triglyceride glucose-body mass index (TyG-BMI) and metabolic syndrome morbidity and mortality is a topic of great interest and importance in the field of healthcare and medicine. TyG-BMI is a relatively new marker that has been proposed as a predictor of metabolic syndrome and its related complications. TyG-BMI is computed as ln [TG (mg/dL) × FBG (mg/dL)/2] × BMI (kg/m2).[3]

Incorporating BMI into its calculation may allow TyG-BMI to better account for the influence of obesity on insulin resistance (IR), and the combination of obesity and TyG can potentially identify IR more strongly than other surrogate markers since obesity is a well-established risk factor for IR. It is believed to reflect IR, a key underlying factor in the development of metabolic syndrome. [3,4]

Numerous studies have explored the relationship between TyG-BMI and morbidity and mortality related to metabolic syndrome. The findings have been varied, with some studies indicating a significant correlation between TyG-BMI and outcomes associated with metabolic syndrome, while others have not found a notable association.[4-6]

A study delved into the relationship between TyG-BMI and metabolic syndrome within a large cohort of Chinese adults. The researchers discovered that elevated TyG-BMI levels were associated with an increased likelihood of developing metabolic syndrome over a 10-year follow-up period. Moreover, individuals with high TyG-BMI levels exhibited a greater risk of cardiovascular events and mortality compared to those with lower TyG-BMI levels.[5]

Another study explored the association between TyG-BMI and mortality in patients diagnosed with type 2 diabetes. The researchers found that higher TyG-BMI levels were independently associated with a heightened risk of all-cause mortality, cardiovascular mortality, and non-cardiovascular mortality within this population.[6]

The mechanistic link between the TyG-BMI and morbidity and mortality related to metabolic syndrome is an area of active research. It is theorized that elevated TyG-BMI levels signify an underlying dysregulation of lipid and glucose metabolism, leading to systemic inflammation, oxidative stress, and endothelial dysfunction. These pathological processes contribute to the development of metabolic syndrome components such as obesity, hypertension, dyslipidemia, and insulin resistance,

thereby escalating the risk of cardiovascular events and mortality.[4-6]

These results suggest that TyG-BMI could serve as a valuable marker for identifying individuals at high risk of developing metabolic syndrome and its associated complications. By monitoring TyG-BMI levels, healthcare providers may intervene early and implement preventive measures to mitigate the morbidity and mortality associated with metabolic syndrome. However, further research is essential to fully comprehend the relationship between TyG-BMI and morbidity and mortality associated with metabolic syndrome. Longitudinal studies with large sample sizes are imperative to validate these findings and establish optimal cutoff values for TyG-BMI as a predictive marker.

Acknowledgment

None.

Competing interests

None.

Authors' contributions

The authors read and approved the final manuscript. They take responsibility for the integrity of the data and the accuracy of the data analysis.

Abbreviations

Metabolic syndrome: MetS;
Triglyceride glucose-body mass index: TyG-BMI;
Body mass index: BMI;
Insulin resistance: IR;
Triglyceride: TG;
Fasting blood sugar: FBG.

Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

None.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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