THE PREDICTIVE VALUE OF TRIGLYCERIDE – GLUCOSE INDEX FOR METABOLIC-DYSFUNCTION ASSOCIATED STEATOTIC LIVER DISEASE IN AN AFRICAN COHORT AT THE MATER MISERICORDIAE HOSPITAL, NAIROBI, KENYA

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Abstract

Background

MASLD, the commonest cause of CLD, has become a silent epidemic posing significant health and economic challenges with a pathophysiological basis that centers around Insulin Resistance (IR). The most widely available tool currently utilized for diagnosis is an abdominal U/S study. However, low sensitivity for early disease, relatively high acquisition costs in LMICs such as Kenya, and limited availability of both infrastructure and personnel in rural settings limit its use. The TyG index, a marker for IR, is emerging as a potential biomarker that can reliably predict the occurrence of MASLD and the possible progression to cirrhosis. As biochemical analyzers are more widely available countrywide and aren't operator-dependent, a biochemical test that could predict MASLD occurrence could add value by increasing inclusivity in health access. A TG paradox in individuals of African ancestry has been described, necessitating validation of this index in this population.

Methods

This retrospective cross-sectional study reviewed abdominal ultrasound records performed between 2020 and 2025. Cases demonstrating hepatic steatosis were identified and matched with corresponding laboratory data, including fasting lipid profiles and glucose levels. Only participants with complete datasets were included. The TyG index and TyG-BMI were calculated, and demographic, clinical, and metabolic parameters were used to characterize participants. Statistical analysis was conducted using R software.

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Results

The TyG index demonstrated modest predictive ability for hepatic steatosis, with an area under the ROC curve (AUC) of 0.60 (95% CI: 0.481–0.717; p = 0.100). The optimal cutoff value (TyG = 4.79) yielded a sensitivity of 85.3% and specificity of 67.5%. TyG values increased across steatosis grades (p = 0.107), and no significant correlation was observed between TyG and steatosis severity (ρ = 0.109, p = 0.310). In both univariable and multivariable logistic regression analyses, TyG was independently associated with moderate-to-severe steatosis, with OR 2.67 (95% CI 0.71-10.04) (p=0.147) and aOR 2.11 (95% CI 0.53-8.38) (p=0.287), respectively.

Conclusion

The TyG index is a validated clinical tool for predicting MASLD occurrence and severity, with applicability even in individuals of African ancestry despite the TG paradox. Its low acquisition cost would promote inclusivity in healthcare access in resource-constrained and rural settings. More research is needed, including a prospective study design and a more representative sample, to validate this tool for NHB populations properly.

5 key words: MASLD, TyG Index, Triglycerides, glucose, Liver