

Metabolic clustering of risk factors: Evaluation of triglyceride-glucose index (TyG index) for evaluation of insulin resistance



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Abstract

Background: Metabolic syndromes over the years have structured definitions to classify an individual with the disease. Literature review suggests insulin resistance is hallmark of these metabolic clustering. While measuring insulin resistance directly or indirectly remains technically difficult in general practice, along with multiple stability issues for insulin, various indirect measures have been suggested by authorities. Fasting triglycerides-glucose (TyG) index is one such marker, which is recently been suggested as a useful diagnostic marker to predict metabolic syndrome. However, limited data is available on the subject with almost no literature from our region on the subject.

Objective:

1. To correlate TyG index with insulin resistance, anthropometric indices, small dense LDLc, HbA1c and nephropathy
2. To evaluate TyG index as a marker to diagnose metabolic syndrome in comparison to other available markers.

Design cross sectional Analysis: Place and duration of study-From Jun-2016 to July-2017 at PSS HAFEEZ hospital Islamabad

Subjects and Methods: From a finally selected sample size of 227 male and female subjects we evaluated their anthropometric data, HbA1c, lipid profile including calculated sdLDLc, urine albumin creatinine ratio (UACR) and insulin resistance (HOMAIR). TyG index was calculated using formula of Simental-Mendia LE et al. Aforementioned parameters were correlated with TyG index; differences between subjects with and without metabolic syndrome were calculated using Independent sample t-test. Finally ROC curve analysis was carried out to measure AUC for candidate parameters including TyG Index for comparison. **Results:** TyG index in comparison to other markers like fasting triglycerides, HOMAIR, HDLc and non-HDLc demonstrated higher positive linear correlation with BMI, atherogenic dyslipidaemia (sdLDLc), nephropathy (UACR), HbA1c and insulin resistance. TyG index showed significant differences between various markers among subjects with and without metabolic syndrome as per IDF criteria. AUC (Area Under Curve) demonstrated highest AUC for TyG as [(0.764, 95% CI 0.700-0.828, p-value≤0.001)] followed by fasting triglycerides [(0.724, 95% CI 0.656-0.791, p-value≤0.001)], sdLDLc [(0.695, 95% CI 0.626-0.763, p-value≤0.001)], fasting plasma glucose [(0.686, 95% CI 0.616-0.756, p-value≤0.001)], Non-HDLc [(0.640, 95% CI 0.626-0.763, p-value≤0.001)] and HOMAIR [(0.619, 95% CI 0.545-0.694, p-value≤0.001)].

Conclusion: TyG index, having the highest AUC in comparison to fasting glucose, triglycerides, sdLDLc, non-HDLc and HOMAIR can act as better marker for diagnosing metabolic syndrome

Biography

Sikandar Hayat Khan is a Medical profession. He did his fellowship in Chemical Pathology from Pakistan and later did a Post-graduate diploma in Endocrinology and Diabetes from UK. He later managed to complete my Masters in Cancer, Molecular Pathology & Genomics from UK. Over 25 years in the field of his medical profession, he managed to publish over 65 publications in the field of metabolic diseases especially type-2 diabetes mellitus, insulin resistance, lipidology. In recent years he developed specific interest in molecular pathology of metabolic diseases including type-2 diabetes mellitus.



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