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Remarkable Indices in Predicting Atherosclerotic Cardiovascular Disease

LETTER TO THE EDITOR

To the Editor,

We read with great interest the article by Song et al titled "Triglyceride-Glucose Index and the Risk of Calcific Aortic Valve Stenosis" and would like to congratulate the authors for highlighting the role of metabolic risk markers in valvular heart diseases.[1] Calcific aortic valve disease and atherosclerotic cardiovascular disease (ASCVD) share similar risk factors and pathogenic mechanisms, leading to comparable clinical outcomes. Therefore, the use of novel approaches and newly developed indices may enable more effective diagnosis, treatment, and follow-up strategies for both clinical conditions. The triglyceride–glucose (TyG) index is a well-known parameter frequently used to assess ASCVDs. We aim to contribute an alternative perspective by integrating this widely used index with several novel indices documented in the literature. In the pathophysiology of ASCVDs, metabolic problems such as insulin resistance, dyslipidemia, and visceral obesity, along with endocrine dysfunction, play a major role.[2,3] New indices have been developed to quantitatively evaluate these risk factors. We know that these indices work through different metabolic pathways. Although ASCVD risk factors are already described in detail in clinical guidelines, combining markers like low-density lipoprotein, triglycerides, and body mass index (BMI) or integrating them with new parameters may improve risk prediction. In the literature, particularly in premature atherosclerosis, various disease groups have been clearly defined, and efforts have been made to develop predictive models before clinical disease onset. Therefore, we aimed to contribute to this topic by integrating our recent publications with updated evidence from the literature. Several studies have evaluated metabolic processes across different diseases using indices such as the TyG index and the C-reactive protein (CRP)-TyG index.[4,5] The TyG index serves as a simple surrogate marker of insulin resistance, while CRP reflects systemic inflammation. The Body Roundness Index (BRI) is an indicator of central obesity, and thyroid-stimulating hormone (TSH) represents thyroid function. Accordingly, the combined assessment of metabolic (TyG), anthropometric (BRI), and endocrine (TSH) markers may offer a valuable approach for improving the prediction of ASCVD risk. In our research, we aimed to examine the combined use of these markers and share our results. In our pilot study on patients with subclinical hypothyroidism, BRI values were significantly higher in those who developed coronary artery disease (CAD), while a new index we developed, BRITSH, was significantly lower in the same group.[6] In hypothyroid patients, BRI showed high performance in predicting CAD (area under the curve (AUC) 86%), and BRITSH showed moderate predictive value (AUC 67%). In multivariate logistic regression analysis, the BRITSH ratio, along with age, diabetes, high-sensitivity CRP, and non-high-density lipoprotein cholesterol, was found to be an independent predictor of CAD. These findings suggest that the BRITSH index, which combines body composition and thyroid function, may be more helpful than traditional measures in predicting CAD risk in hypothyroid patients. In another study, we investigated the TyG-BRI index and its ability to predict in-hospital mortality in elderly patients with ST-elevation myocardial infarction (STEMI). Among octogenarians (≥80 years), those who died during hospitalization had significantly higher TyG-BRI values than survivors.[7] Each unit increase in

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TyG-BRI was associated with a 32% higher risk of in-hospital mortality. A TyG-BRI cutoff value of >30.7 had 83% sensitivity and 67% specificity in predicting mortality. Our results showed that the TyG-BRI index, which can be calculated from routine laboratory and body measurements, may provide independent, low-cost risk prediction beyond traditional risk factors in elderly STEMI patients. This suggests that combining metabolic and body composition indicators may improve risk stratification in older adults. The prognostic value of TyG and combined indices has been studied in various clinical settings. For example, in a recent study of 1095 patients with hypertrophic cardiomyopathy and preserved ejection fraction heart failure, surprisingly, those in the highest TyG quartile had lower long-term all-cause and cardiovascular mortality compared to those with lower TyG values.[8] Furthermore, combining multicomponent parameters may improve the prediction of cardiovascular disease risk (Figure 1). In fact, combining clinical, biochemical, and vascular imaging markers has been shown to significantly improve the detection of asymptomatic atherosclerosis.[9] In conclusion, BRI may help to fill the gap left by BMI in capturing body composition in ASCVD risk prediction. The combined use of metabolic-endocrine indices like TyG-BRI and BRITSH can improve risk classification and provide meaningful contributions to clinical practice. These integrated approaches better reflect the risk caused by metabolic disorders and visceral adiposity and may guide more personalized preventive strategies.

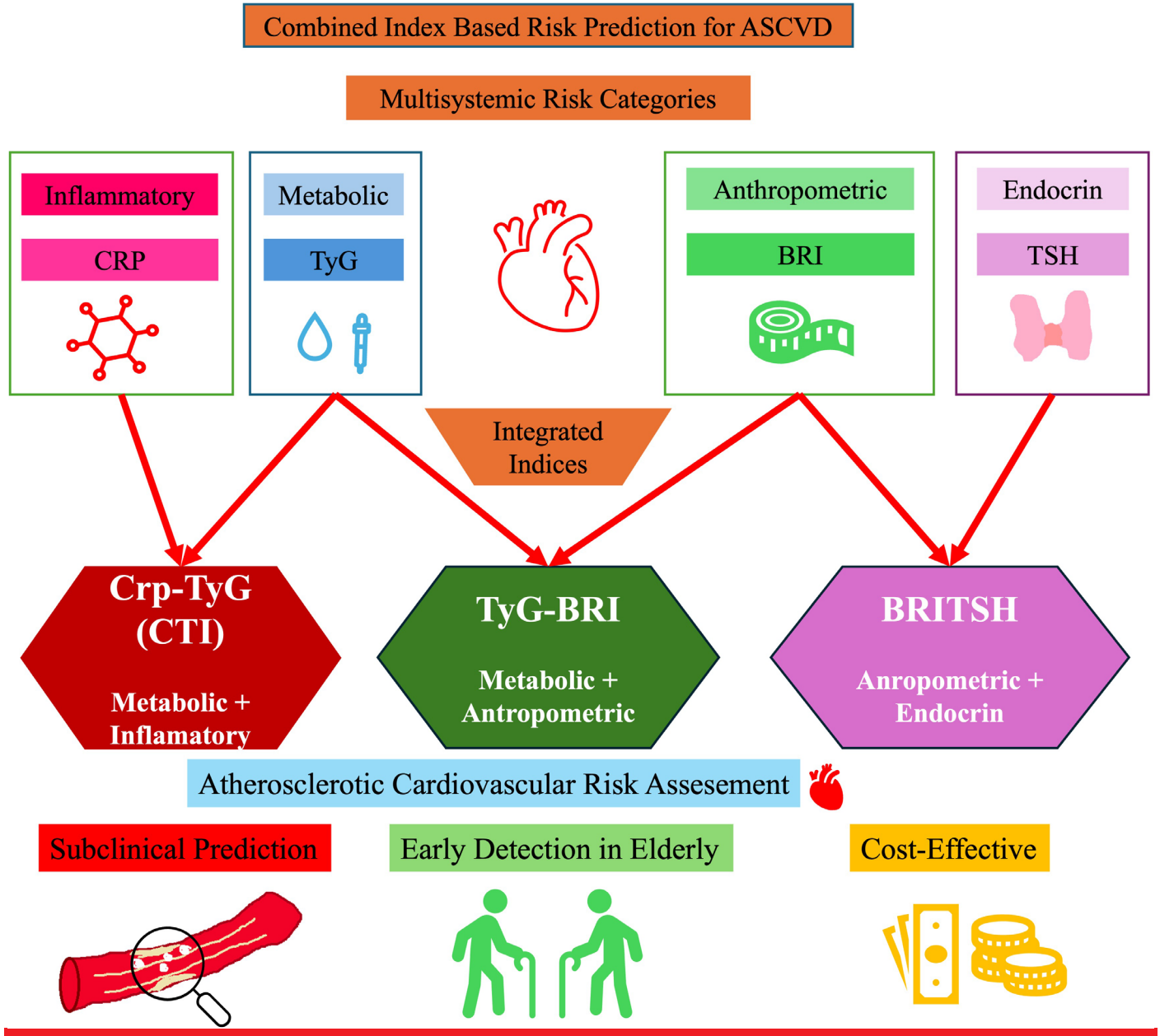

Figure 1. Integrated indices for ASCVD prediction. ASCVD, atherosclerotic cardiovascular diseases; BRI, Body Roundness Index; CRP, C-reactive protein; TSH, thyroid-stimulating hormone; TyG, triglyceride–glucose.

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