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Screening for Prediabetes in Youth with Obesity: Evaluating the TyG Index

You're listening to *Clinician's Roundtable* on ReachMD, and this is an *AudioAbstract*. I'm Ryan Quigley. Today, we're reviewing a cross-sectional study published in *Frontiers in Endocrinology* in September 2025, which evaluated the triglyceride–glucose index, or TyG index, as a potential screening tool for prediabetes mellitus in children and adolescents with obesity.

For some background, prediabetes in youth is becoming more common worldwide, especially among adolescents with obesity, where rates can exceed 25 percent in the US. The condition often progresses to type 2 diabetes within just a few years, which is faster than the typical course in adults.

At the same time, the tools we commonly use for screening, like fasting glucose or HbA1c, may miss early metabolic dysfunction. Oral glucose tolerance testing remains the gold standard, but it's difficult to use in routine practice. This study aimed to determine whether the TyG index, which is calculated using fasting glucose and triglyceride levels, could offer a simpler and more accessible alternative.

The study included 213 children and adolescents between eight and 18 years of age who were hospitalized at Henan Provincial People's Hospital in China, all of whom had obesity defined by a body mass index above the 95th percentile. Based on oral glucose tolerance testing, participants were classified as having either normal glucose tolerance or prediabetes.

The researchers used LASSO regression to select key predictive variables and then performed logistic regression and ROC curve analysis to compare the TyG index with fasting glucose, triglycerides, HbA1c, and homeostasis model assessment of insulin resistance, or HOMA-IR for short.

The results demonstrated that the TyG index was significantly higher in those with prediabetes and was independently associated with prediabetes risk, even after adjusting for potential confounders like BMI, blood pressure, lipid levels, and family history. In fully adjusted models, the TyG index had an odds ratio of 13.29 for predicting prediabetes.

In the ROC curve analysis, the TyG index achieved an area under the curve of 0.78. While this was numerically higher than the values for fasting glucose, triglycerides, and HOMA-IR, and just below that of the two-hour post-load glucose, the overlapping confidence intervals suggest that these differences were not statistically significant. The optimal TyG cutoff identified in this study was approximately 8.9, corresponding to a sensitivity of about 55 percent and a specificity of 85 percent.

When children were divided into three groups based on TyG index values, those in the highest group—defined as a TyG index above 8.9—had a 13-fold higher risk of prediabetes compared to those in the lowest group, with a TyG index of 8.42 or below. The risk rose progressively across the tertiles, supporting the TyG index not only as a potential screening tool, but also as a means of stratifying risk within this population.

Mechanistically, the TyG index may reflect both impaired glucose regulation and lipid metabolism, providing a more complete picture of hepatic insulin resistance. Unlike HOMA-IR, it doesn't require insulin testing and can be calculated from labs that are already standard in pediatric evaluations. This makes it particularly useful in primary care and school-based health settings.

However, there are some limitations to this research. It was a cross-sectional study, so it cannot show cause and effect or predict long-term outcomes. It was also conducted in a single center, which may limit how well the findings apply to other populations. And although the TyG index showed good specificity, its moderate sensitivity means it should not be used alone for definitive screening.

In summary, the TyG index appears to be a practical, affordable, and reasonably accurate tool for identifying prediabetes in children and adolescents with obesity. It may be especially valuable in settings where traditional testing is limited or where early stratification could

improve targeted follow-up. Larger, multiethnic, and longitudinal studies are still needed to determine how best to use this tool in clinical practice.

This has been an *AudioAbstract*, and I'm Ryan Quigley. To access this and other episodes in our series, visit *Clinician's Roundtable* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!

Reference

Liu H, Wang L, Zhu X, et al. Can the triglyceride-glucose index identify prediabetes in children and adolescents with obesity? a cross-sectional study. *Front Endocrinol (Lausanne)*. 2025;16:1657912. Published 2025 Sep 25. doi:10.3389/fendo.2025.1657912