Association between High Triglyceride-Glucose Index and Diabetic Nephropathy in Asian Populations

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Dear Editor,

I just read the insightful article entitled Association Between High Triglyceride-Glucose Index and Diabetic Nephropathy in Asian Populations: A Meta-Analysis Perspective which appeared in The Egyptian Journal of Internal Medicine. The research revealed some important outcomes with the relationship between metabolic indices and their association with developing diabetic nephropathy [1]. As a clinician mainly interested in the care of diabetes patients, I would like to expand the discussion on this theme by considering the importance of the Triglyceride-Glucose (TyG) index, especially regarding Asian population conditions.

Diabetes mellitus (DM) still accounts for one of the most widespread chronic diseases across different parts of the globe, taking a significant toll, especially on Asians and causing microvascular complications like nephropathy. Newer therapies in diabetes go beyond glycemic control to target the associated metabolic dysfunctions. The latest innovations in the development of thiazole derivatives incorporating pyrazole scaffolds are promising for antidiabetic and anti-inflammatory activities and provide fresh grounds in diabetes management [2].

TyG index based on triglycerides and glucose levels is now considered a very promising indicator of insulin resistance. It is increasingly being recognized that finding a high TyG index would usually indicate not only metabolic derangement but also substantially higher incidence rates of much more diabetic complications, nephropathy inclusive. Recent meta-analytic reports present extremely convincing evidence in favour of this relationship especially strong among Asian populations, for they are most affected by kidney disease regarding diabetes.

Elevated TyG index values have been associated with several complications other than diabetic nephropathy, namely heart disease, chronic kidney disease progress, and increased mildly inflammatory responses. Recent studies have also established the association of the TyG index with oxidative stress and endothelial dysfunction, which are vital mechanisms that lead to both microvascular and macrovascular diabetic complications [3]. This indicates that including TyG as a routine marker would offer a significant opportunity to predict multiple adverse outcomes associated with diabetes.

The most recent meta-analysis by Zhang *et al.* (2020) pooled data from multiple cohort studies across several Asian countries and found a solid association between increased TyG index values and increased risk of development of diabetic nephropathy. Moreover, it discussed the ability of TyG to serve as an early predictive biomarker that could be integrated into routine clinical practice in the follow-up of patients at risk of kidney damage.

This becomes even more important as diabetic nephropathy is usually silent in the early stages, making early detection critically important to prevent end-stage renal disease [4].

Unique problems exist in Asian populations' genetics and dietary habits, which may predispose them to even higher occurrences of developing insulin resistance and, subsequently, kidney complications. It would revolutionize the treatment of diabetes in this high-risk population if diabetic nephropathy prediction could be done using easy-to-construct indices such as TyG [5].

There is still some gap in literature that needs to be filled despite the promise of such research findings. Future prospective studies need to be designed with a large sample and encompass diverse Asian subpopulations to unravel the temporal relationship between TyG index and nephropathy. Besides, the role of TyG at different stages of nephropathy (for example, from early microalbuminuria to more advanced kidney disease) should be further investigated.

In conclusion, TyG index indeed has enormous potentials as a non-invasive, low-cost tool for identifying subjects at a higher risk for developing diabetic nephropathy in the Asian population. I hope this observation provokes further explorations into the clinical worth of TyG, which would ultimately benefit patient practice in improving outcomes through early intervention.

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Received: April 04, 2025; Revised: April 28, 2025; Accepted: May 07, 2025
DOI: https://doi.org/10.37184/jlnh.2959-1805.3.22

I appreciate your considering this letter and looking forward to your thoughts on this important issue.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

1. Tiongco RE, Cayanan ND, Dominguez MJ, Geonzon K, Mercado JA, Pineda-Cortel MR. High triglyceride-glucose index in patients with diabetes mellitus is associated with an increased likelihood of nephropathy development: evidence from a meta-analysis among Asian population. Egypt J Intern Med 2025; 37(14).
   DOI: https://doi.org/10.1186/s43162-025-00402-3
2. Fadaly WAA, Elshewy A, Nemr MTM, Abdou K, Sayed AM, Kahk NM. Discovery of novel thiazole derivatives containing pyrazole scaffold as PPAR-γ Agonists, α-Glucosidase, α-Amylase and COX-2 inhibitors; Design, synthesis and in silico study. Bioorg Chem 2024; 152: 107760.
   DOI: https://doi.org/10.1016/j.bioorg.2024.107760
3. Nemr MTM, Abdelaziz MA, Teleb M, Elmasry AE, Elshaier YAAM. An overview on pharmaceutical applications of phosphodiesterase enzyme 5 (PDE5) inhibitors. Mol Divers 2024. Online ahead of print.
   DOI: https://doi.org/10.1007/s11030-024-11016-2 PMID: 39592536
4. Zhang XX, Kong J, Yun K. Prevalence of diabetic nephropathy among patients with type 2 diabetes mellitus in China: a meta-analysis of observational studies. J Diabetes Res 2020; 2020: 2315607.
   DOI: https://doi.org/10.1155/2020/2315607 PMID: 32090116
5. Chamroonkiadtikun P, Ananchaisarp T, Wanichanon W. The triglyceride-glucose index, a predictor of type 2 diabetes development: a retrospective cohort study. Prim Care Diabetes 2020; 14(2): 161-7.
   DOI: https://doi.org/10.1016/j.pcd.2019.08.004 PMID: 31466834