# The Triglyceride to High-Density Lipoprotein Cholesterol Ratio Is a Useful Marker to Predict Unfavorable Cardiovascular Outcomes, But Other Confounding Factors Should Be Considered

*To the Editor:*

We read with interest the article entitled "The Role of Plasma Triglyceride/High-Density Lipoprotein Cholesterol Ratio to Predict New Cardiovascular Events in Essential Hypertensive Patients" by Turak and colleagues[1] published in the *Journal of Clinical Hypertension*. The authors investigated the association of plasma triglyceride/high-density lipoprotein cholesterol (TG/HDL-C) ratio with fatal and nonfatal major adverse cardiovascular events (MACEs). They concluded that plasma TG/HDL-C ratio might be used as a novel marker for new cardiovascular events in essential hypertensive patients.

However, factors other than plasma TG/HDL-C ratio may also be attributed to the development of cardiovascular disease. Firstly, the effect of renin-angiotensin system blockade was not analyzed in the present study. The use of angiotensin-converting enzyme inhibitors or angiotensin receptor blockers has the potential to reduce MACEs in diabetic patients.[2,3] Thus, the probable impact of these drugs on relevant cardiovascular events, an issue not discussed in the paper, is of clinical importance.

Secondly, the dipping or nondipping pattern of hypertension should have been determined. Nocturnal dipping refers to a 10% or more reduction in average systolic and diastolic blood pressure at nighttime compared with daytime average values. A lesser magnitude of nocturnal reduction is defined as nondipping pattern, which is also shown to increase MACEs and target organ damage in hypertensive patients.[4,5] Although not always possible in clinical practice, 24-hour ambulatory blood pressure monitoring (ABPM) provides valuable information about cardiovascular risk. As the participants in the present study did not undergo ABPM, the likely impact of nondipping pattern in hypertensive patients was not assessed—a limitation that should be considered in the interpretation of the results.

Finally, the increased mortality and morbidity risk in patients with hypertension signifies the necessity of a simple and inexpensive marker in clinical practice. However, the prognostic importance of plasma TG/HDL-C ratio remains a controversial topic. Recent evidence suggests the plasma TG/HDL-C ratio as a well-established estimate of insulin resistance, which is closely associated with unfavorable cardiovascular outcomes.[6] Oxidative stress and inflammatory status may also contribute to the development of both fatal and nonfatal cardiovascular events. Furthermore, endothelial dysfunction appears to be a consistent finding not only in hypertensive patients, but also in those with diabetes or chronic kidney disease, which were reported to be additional independent predictors of fatal and nonfatal events in the present study. However, further studies are required to better elucidate their interactions and contribution to endothelial dysfunction.

Despite all this uncertainty, the plasma TG/HDL-C ratio seems to emerge as a simple and reproducible predictor of cardiovascular risk in hypertensive patients.

*Disclosures: Financial disclosure statements have been obtained, and no conflicts of interest have been reported by the authors or by any individuals in control of the content of this article.*

Hilmi Umut Ünal, MD;[1] Yalçın Başaran, MD;[2] Mustafa Gezer, MD[1]

*From the [1]Department of Nephrology, Gulhane Military Medical Academy, Ankara, Turkey; [2]Department of Endocrinology, Gulhane Military Medical Academy, Ankara, Turkey*

## References

1. Turak O, Afşar B, Ozcan F, et al. The role of plasma triglyceride/high-density lipoprotein cholesterol ratio to predict new cardiovascular events in essential hypertensive patients. *J Clin Hypertens. (Greenwich)*. 2016;18:772–777.
2. Nakao YM, Teramukai S, Tanaka S, et al. Effects of renin-angiotensin system blockades on cardiovascular outcomes in patients with diabetes mellitus: a systematic review and meta-analysis. *Diabetes Res Clin Pract*. 2012;96:68–75.
3. Schmieder RE, Hilgers KF, Schlaich MP, et al. Renin-angiotensin system and cardiovascular risk. *Lancet*. 2007;369:1208–1219.
4. Cuspidi C, Macca G, Sampieri L, et al. Target organ damage and nondipping pattern defined by two sessions of ambulatory blood pressure monitoring in recently diagnosed essential hypertensive patients. *J Hypertens*. 2001;19:1539–1545.
5. Cuspidi C, Sala C, Tadic M, et al. Non-dipping pattern and subclinical cardiac damage in untreated hypertension: a systematic review and meta-analysis of echocardiographic studies. *Am J Hypertens*. 2015;28:1392–1402.
6. Salazar MR, Carbajal HA, Espeche WG, et al. Relation among the plasma triglyceride/high-density lipoprotein cholesterol concentration ratio, insulin resistance, and associated cardio-metabolic risk factors in men and women. *Am J Cardiol*. 2012;109:1749–1753.

doi: 10.1111/jch.12807