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LETTER TO THE EDITOR

When cardiology meets endocrinology: could subclinical hypothyroidism be a reliable predictor of worsened cardiovascular outcomes following acute myocardial infarction in patients with diabetes?

In this issue of *Acta Cardiologica*, Lei Liu and colleagues present interesting data supporting a view that acute myocardial infarction (AMI) patients with diabetes and subclinical hypothyroidism (SCH) was associated with worsened in-hospital outcomes and higher 30-day and long-term mortality [1]. Although similar results have been described in some previous studies, these new results may challenge current knowledge on pathophysiological links between the heart, the thyroid and diabetes.

There are several mechanisms that might explain the associations of SCH and high-normal TSH with cardiovascular death. Previous studies reported that low thyroid function (even within the normal range) is associated with insulin resistance/metabolic syndrome, progression of atherosclerosis and increased cardiovascular disease risk [2].

Such correlation studies between SCH and cardiovascular morbidity and mortality are limited, as causality is not demonstrated and the mechanisms remain unexplored. Moreover, whereas SCH characteristically presents with elevated thyroid-stimulating hormone (TSH) and normal thyroxine (T4) levels, the range of TSH elevation may vary from one study to another. Importantly, as the TSH distribution differs by sex and age, stratum-specific analyses need to be conducted to estimate the associations of TSH with mortality using category-specific tertiles to define low, middle, and high-normal TSH in each analysis [3]. Another limiting factor is that historical and follow-up thyroid hormone data of patients are not available to study. Finally, AMI itself, as an acute illness and as a confounding factor, may contribute to TSH and thyroid hormone changes [4].

In the future, to improve SCH and cardiovascular studies, it would be advisable to evaluate thyroid structural and functional alterations. Iodine status and thyroid autoimmunity would be helpful to evaluate the cause of SCH, whereas thyroid gland ultrasounds may be useful to ascertain structural changes in the gland. As peripheral thyroid hormones are subjected to acute regulation, some researchers have proposed that the FT3/FT4 ratio could improve the understanding of thyroid homeostasis. Indeed, a low FT3/F4 ratio had been linked to poor prognosis of AMI in euthyroid patients with Type 2 diabetes [5].

What other measures could improve our understanding of the pathophysiological links between SCH and AMI in patients with diabetes? As SCH could be a valuable risk factor to predict poor cardiovascular outcome in patients with diabetes, further study will be needed to examine the clinical benefit of medical intervention in such patients with elevated TSH concentrations. Until now, no publication has definitely demonstrated that treating SCH can improve the cardiovascular outcome of AMI patients. Whether thyroid hormone treatment could improve patients' clinical cardiovascular outcomes remains inconclusive and awaits further study [6]. Future investigations with larger sample sizes and longitudinal measures of TSH levels and cardiovascular events are warranted to overcome these limitations, to replicate and validate these findings, and to estimate the overall impact of the association between thyroid function and cardiovascular mortality.

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References

[1] Liu L, Zeng B, Zhang J, et al. Impact of subclinical hypothyroidism on in-hospital outcomes and long-term mortality among acute myocardial infarction patients with diabetic mellitus. Acta Cardiol. 2023;1–9. doi:10.1080/00015385.2023.2279421.

[2] Mehran L, Amouzegar A, Azizi F. Thyroid disease and the metabolic syndrome. Curr Opin Endocrinol Diabetes Obes. 2019;26(5):256–265. doi:10.1097/MED.0000000000000500. Q1

[3] Boucai L, Hollowell JG, Surks MI. An approach for development of age-, gender-, and ethnicity-specific thyrotropin reference limits. Thyroid. 2011;21(1):5–11. doi:10.1089/thy.2010.0092.

[4] Van den Berghe G. Thyroid non-thyroidal illness in the ICU: a syndrome with different faces. Thyroid. 2014;24(10):1456–1465. doi:10.1089/thy.2014.0201.

[5] He X, Gao R, Wu Y, et al. Low FT3/FT4 ratio is linked to poor prognosis of acute myocardial infarction in euthyroid patients with type 2 diabetes mellitus. J Clin Med. 2022;11(21):6530. doi:10.3390/jcm11216530.

[6] Shi C, Bao Y, Chen X, et al. The effectiveness of thyroid hormone replacement therapy on heart failure and low-triiodothyronine syndrome: an updated systematic review and meta-analysis of randomized controlled trials. Endocr Pract. 2022;28(11):1178–1186. doi:10.1016/j.eprac.2022.07.004.

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