



Letter to Editor

Is Acidosis or Alkalosis a Risk Factor for Coronary Artery Disease, or is the Mechanism Much More Complex?

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Dear Editor,

I read Amirzadegan et al.'s article titled "Tendency to acidosis or alkalosis: Which one is associated with coronary artery disease?" published in *Journal of Cardiovascular and Thoracic Research*, with great interest.¹ Although the study provides important insights into the pathophysiology of coronary artery disease in relation to acid–base balance, I would like to highlight several points that may help to further clarify the findings.

Multiple mechanisms contribute to the pathophysiology of chronic coronary syndrome and atherosclerosis. Inflammation, oxidative stress, endothelial dysfunction, and metabolic disturbances are among the key contributors to atherogenesis.² Acid–base balance plays a critical role in maintaining enzymatic and cellular function. Disruptions in this balance may impair physiological processes and contribute to tissue injury. Acid–base disturbances may influence endothelial function, oxidative stress, inflammatory pathways, and myocardial metabolism, all of which are implicated in the development and progression of atherosclerosis. Therefore, alterations in acid–base homeostasis may represent not only markers of underlying systemic disease but also potential contributors to cardiovascular pathology.³ However, acid–base homeostasis is a highly dynamic system that can change rapidly and is influenced by numerous physiological and pathological factors.⁴ Temporary or chronic disturbances in acid–base balance may arise from a variety of clinical conditions. Acidosis may develop in the setting of acute or chronic renal dysfunction, dehydration, or carbon dioxide retention secondary to ventilation–perfusion abnormalities, whereas medications such as bicarbonate-containing agents, loop diuretics, and acetazolamide may contribute to alkalosis. Furthermore, diabetes mellitus, obesity, and heart failure are associated with metabolic and neurohormonal alterations that may affect both acid–base regulation and cardiovascular risk. Importantly, these alterations may be transient or persistent, depending on the underlying cause and clinical context. Therefore, the

use of a single blood sample to assess acid–base status may capture only a temporary physiological or pathological state rather than an individual's long-term acid–base profile. This temporal variability may lead to exposure misclassification and potentially attenuate or obscure true associations between acid–base balance and chronic coronary syndrome, a disease that develops progressively over time.^{5,6}

Another important limitation is the lack of detailed information regarding medication use.⁷ Many medications can influence metabolic and acid–base balance, which may affect the study results. While the study failed to demonstrate an association between base excess and the presence of coronary artery disease, an association was observed with the Gensini score, which reflects disease severity. However, the demographic and clinical characteristics of patients with and without coronary artery disease were not compared. In this context, differences in renal function and potential heterogeneity in comorbid conditions—which may influence acid–base balance—could directly affect the results, representing a significant limitation.

Despite these limitations, the study by Amirzadegan and colleagues provides valuable preliminary insights into the relationship between coronary artery disease and acid–base balance. Future well-designed prospective studies are needed to further clarify this association.

Authors' Contribution

Conceptualization: Mehmet Uğur Çalışkan
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Competing Interests

The author declares no conflict of interest in this study.

Ethical Approval

Not applicable.

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