INVITED EDITORIAL

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# Chronic kidney disease and cardiovascular disease: what came first, the chicken or the egg?

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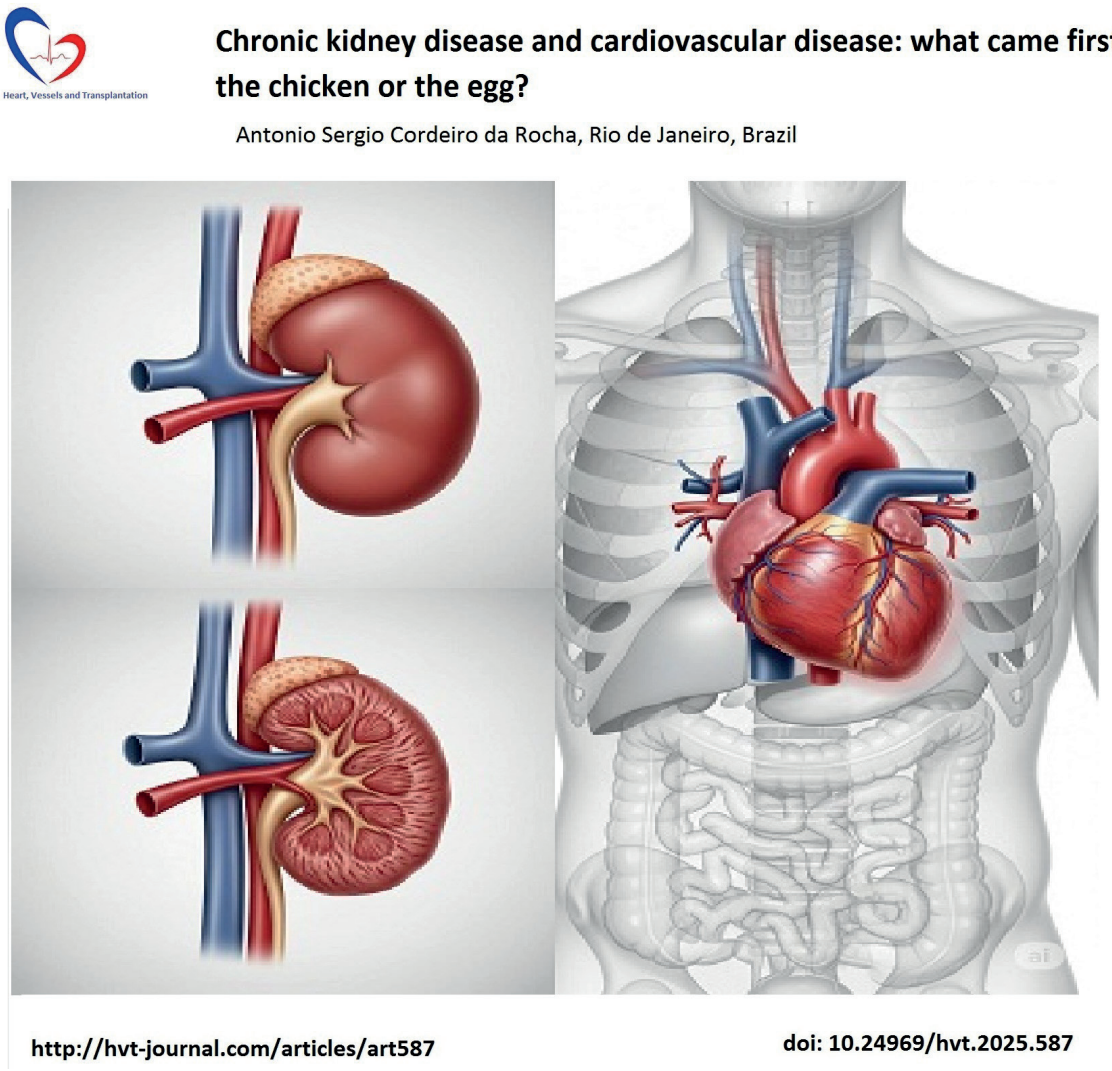
## Graphical abstract




**Key words:** Atherosclerotic cardiovascular disease, chronic kidney disease, risk factors

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Chronic kidney disease (CKD) and cardiovascular disease (CVD) have a complex interrelationship. It has been shown that they generally share the same prevalent risk factors. It is assumed that, depending on age, CVD precedes CKD. On the other hand, CKD contributes to the worsening of already established CVD (1-3).

It has been recognized that in low and middle-income countries there is a large gap between CKD burden and adequate healthcare for these patients. In addition to the increasing prevalence of hypertension and diabetes, there is limited access to kidney replacement therapy in these countries, which highlights the importance of early identification and correction of risk factors in primary care (4).

In this June 2025 issue of the journal, Birhan et al. evaluated the prevalence of atherosclerotic CVD and risk factors in patients with pre-dialysis CKD in a specialized center in the capital of Ethiopia (5).

In a cross-sectional study, they analyzed 216 non-consecutive patients followed at the hospital's renal clinic. The mean age of the patients was 55.6 years, and 149 (69%) were male. Hypertension was present in 197 (91.2%), and diabetes in 104 (48.1%) patients, but according to the authors they are the leading cause of the CKD in 34.3% and 41.7% of the patients, respectively.

Considering that one-third of the study population is under 50 years of age, the question remains as to what causes CKD in these patients. Although the authors did not report the relationship between age group and causes of CKD in the population studied, Table 2 shows that almost 17% had obstructive uropathy, glomerulonephritis, or autosomal dominant polycystic kidney disease, and 7.4% unknown causes. Therefore, it is assumed that these patients have a lower prevalence of cardiovascular diseases than patients with CKD associated with changes in metabolism, specially diabetes, or systemic arterial hypertension (4).

To diagnose atherosclerotic CVD the authors used the previous history of acute coronary syndrome, evidence of coronary disease on echocardiography, documentation of peripheral arterial disease by Doppler ultrasonography or a history of ischemic or hemorrhagic stroke or transient ischemic attack. According to these criteria, the prevalence of atherosclerotic cardiovascular disease was 27.8%, ischemic heart disease in 31, cerebrovascular disease in 24, and peripheral arterial disease in 9 patients. However, only 3 patients underwent to coronary angiography, all with coronary artery disease, and the authors did not inform why these patients underwent coronary angiography.

Analyzing the study as a whole, it is clear, as the authors emphasized in the limitations, that the diagnosis of atherosclerotic CVD, especially ischemic heart disease, was underestimated. However, even with these limitations, the authors demonstrated a high prevalence of atherosclerotic CVDs and risk factors, mainly diabetes and systemic arterial hypertension among patients with CKD evaluated in the kidney disease clinic of their country.

Between 1990 and 2019, CKD has risen from the 19th to 11th in rank among the leading causes of death worldwide, and that the highest concentration of deaths was in low- and moderate-income countries. Currently, kidney disease awareness remains low, and worldwide only 6% of the general population and 10% of the high-risk population are aware of their CKD status. Therefore, the authors' efforts to analyze the prevalence of CVD in patients with CKD are commendable, with the aim of motivating the scientific community in their country to identify risk factors and early CVD in these patients. And it seems obvious that slowing CKD progression at early stage should provide not only economic benefits but prevent the development of kidney failure and cardiovascular complications (4).

It is also important to emphasize that there is growing knowledge about the complex interaction between metabolic risk factors, CKD and the cardiovascular system, with the consequent expansion of new therapies to prevent or mitigate metabolic risk factors, slow the progression of kidney disease and reduce the associated cardiovascular risk (1-3).

Although it is difficult to answer which came first due to the complex interaction between CKD and atherosclerotic CVD, it is clear that they share many risk factors, and that CKD in any stage is a proinflammatory state strongly associated with high cardiovascular risk (1).

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