

Cardiovascular burden in uremia

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Uremic illness in patients with chronic kidney disease (CKD) is primarily a consequence of inadequate removal and subsequent accumulation of organic products normally metabolized or excreted by the kidney. Accumulated uremic solutes are termed uremic toxins if they are biologically active. The accumulation of uremic toxins is associated with negative effects on almost every organ system, though most notably on the cardiovascular (CV) system. In patients with CKD, cardiovascular disease (CVD) is associated with substantial morbidity and mortality, and is a major health concern even among those in early stages of this disease. Considerable effort has gone into understanding the mechanisms responsible for such toxicity and to develop therapeutic interventions which can reduce the adverse effects of uremic toxins. Uremic toxins are both a cause and consequence of CKD, and their negative impact on the CV system is thought to be multifactorial with incompletely understood mechanisms. Identifying and understanding factors that negatively impact CV health in patients with CKD is crucial to the development of therapies aimed at reducing adverse CV outcomes. It is well known that CKD is a chronic pro-inflammatory state that is both a cause and a result of oxidative stress. Chronic inflammation (predominantly mediated by macrophages) and oxidative stress play a critical role in the progression of CKD and CKD-related CVD. A broad range of nontraditional risk factors also appear to play a role in the pathogenesis of CVD in patients with CKD. The net effect of these traditional and nontraditional risk factors is an increase in CV-related morbidity and mortality above and beyond that which occur in patients without CKD.