

RISK FACTORS

Does uric acid level affect renal and cardiovascular risk?

Two papers published in the August 2010 issue of the *American Journal of Kidney Diseases* provide further evidence that hyperuricemia is a risk factor for renal and cardiovascular disease.

Many studies have shown that high serum uric acid level is an independent risk factor for cardiovascular and renal disease, and epidemiological studies have indicated that hyperuricemia might have a causal role in kidney disease. However, as hyperuricemia often occurs in patients with other risk factors for chronic kidney disease (CKD) and cardiovascular disease, including hypertension, diabetes and proteinuria, the independence of the association is unclear.

In one of the two recent studies, Gianni Bellomo and colleagues recorded measurements such as blood pressure, estimated glomerular filtration rates (eGFRs) and serum uric acid levels of 900 healthy normotensive adults. Exclusion criteria included known diabetes, hypertension, nephropathies, gout, or a history of cardiovascular disease. The researchers found that mean eGFR decreased from 97 ml/min/1.73 m² to 88 ml/min/1.73 m² after a median of 59 months of follow-up, and that higher

serum uric acid levels at baseline were associated with a greater risk of eGFR decline in men and women. After adjusting for potential confounding factors (including BMI, blood glucose level, urinary albumin-to-creatinine ratio, baseline eGFR, age and sex), the researchers found that each 59 μmol/l (1 mg/dl) increase in serum uric acid level at baseline was associated with a 23% increase in the risk of an eGFR decrease of >2 ml/min per year.

In the other study, Chi Pang Wen *et al.* followed 484,568 healthy adults who were taking part in a medical screening program in Taiwan for a median of 8.5 years. The researchers found that high serum uric acid level was a risk factor for both all-cause and cardiovascular mortality, even in individuals at very low risk of cardiovascular disease, but that adjustments for proteinuria and eGFR attenuated the association between serum uric acid level and outcome. Just 13.5% of hyperuricemic individuals had significant mortality risks in the absence of overt cardiovascular risk factors, and Wen *et al.* conclude that in most individuals, high uric acid level is “more like a risk marker for mortality than a target for treatment”.



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Whether treatment of hyperuricemia can prevent CKD and cardiovascular disease is unclear, but a recent small study by Marian Goicoechea and colleagues showed that allopurinol, an agent that reduces serum uric acid level, slowed progression of renal disease and reduced the risk of cardiovascular events in 113 patients with CKD.

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Original articles Bellomo, G. *et al.* Association of uric acid with changes in kidney function in healthy normotensive individuals. *Am. J. Kidney Dis.* **56**, 264–272 (2010) | Wen, C. P. *et al.* Is high serum uric acid a risk marker or a target for treatment? Examination of its independent effect in a large cohort with low cardiovascular risk. *Am. J. Kidney Dis.* **56**, 273–288 (2010) | Goicoechea, M. *et al.* Effect of allopurinol in chronic kidney disease progression and cardiovascular risk. *Clin. J. Am. Soc. Nephrol.* **5**, 1388–1393 (2010)