Uric acid levels and outcomes from coronary artery bypass grafting: Is it the chicken or the egg?

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Elevated uric acid levels are associated with risk factors common to patients who require coronary artery bypass graft (CABG) surgery. In this edition of the *Journal*, Hills and coworkers now propose that hyperuricemia may also be an independent risk factor for adverse events after CABG surgery.¹ In this single-center, retrospective series, the authors have shown that patients with hyperuricemia undergoing isolated, nonemergency surgery have a higher incidence of mortality over a 3-year period. Hyperuricemia has been associated with adverse cardiovascular events in patients with atherosclerotic disease.² Furthermore, it has been shown that cardiovascular events are decreased in patients undergoing CABG who receive allopurinol in the perioperative period.³ Thus, this study would be novel if the authors showed that in a group of patients undergoing cardiac surgery with optimal perioperative care, hyperuricemia still emerged as a marker of increased long-term cardiovascular mortality. Unfortunately, the authors have not provided us with that data.

Patients with hyperuricemia were more likely to be older, to have worse renal function, to be obese, to have reduced ejection fraction, and to have higher Euroscores. All of these factors are associated with reduced long-term survival after CABG surgery. The incidence of diabetes mellitus in this series was relatively low, only 11%, suggesting that this disease may have been undiagnosed. Studies have shown that undiagnosed diabetes mellitus is a significant predictor of decreased survival 1 year after CABG.⁴ Could it be that a significant number of these patients with hyperuricemia actually had diabetes mellitus? We are not told about perioperative glucose and glycosylated hemoglobin values. Furthermore, there was no formal protocol to maintain glycemic control during the perioperative period.

No data are provided regarding the perioperative use of beta-blockers, statins, and angiotensin enzyme inhibitors,

or low-density lipoprotein levels before surgery. Hyperuricemia has been associated with hypercholesterolemia, which results in decreased graft patency and increased cardiovascular events.⁵ The underuse of statins could easily have accounted for the poor long-term outcomes in the patients with hyperuricemia. Furthermore, we are not told how many patients with hyperuricemia had a diagnosis of gout preoperatively and how many actually received allopurinol before or after surgery. The exact causes of death are not provided, and the sample size is limited such that only univariate analyses could be performed.

We are still left wondering whether it is the elevated uric acid levels or the comorbidities associated with them that are responsible for the poor long-term survival. Furthermore, because the high uric acid levels were not appropriately treated, we have no idea as to whether survival could be improved if these patients were properly treated with allopurinol. The answer to these questions can only be provided from a larger cohort of patients who receive appropriate therapy for hyperuricemia, as well as for diabetes and hypercholesterolemia. Until then, in patients with hyperuricemia after CABG surgery, we are left to wonder, is it the chicken or the egg?

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