Acute kidney injury after cardiac surgery: *Et puis après?*

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In this issue of the *Journal*, O'Sullivan and coauthors¹ report on the effect of obesity (defined as body mass index ≥ 30 kg/m²) on acute kidney injury (AKI) after cardiac surgery. Their multivariate logistic regression revealed that obesity was independently associated with the development of postoperative AKI (odds ratio [OR], 2.12; 95% confidence interval [CI], 1.27-3.54; $P = .004$), as were, to a lower extent, age (OR, 0.98; 95% CI, 0.96-1.0; $P = .04$) and cardiopulmonary bypass time (OR, 0.99; 95% CI, 0.98-1.0; $P = .048$) but not diabetes and peripheral vascular disease. O'Sullivan and coauthors conclude that obesity is independently associated with an increased risk of AKI after cardiac surgery and that further understanding of the molecular basis of this association is critical to the design of preventative strategies.

O'Sullivan and coauthors¹ retrospective analysis of 432 consecutive patients provides an interesting look into obesity as a neglected risk factor. We cannot control the weight of our patients and, although we are certainly aware of the increased risk of infection and respiratory failure, the constant inflammatory state induced by their metabolic disorder is worrisome. One could speculate that graft patency and neurocognitive functions could be affected as well.

The prevention of AKI in the short term demonstrated in the CORONARY trial^{2,3} is certainly a bonus for patients but, despite a clear protective effect from off-pump coronary artery bypass grafting at 30 days (OR, 0.87; 95% CI, 0.80-0.96; $P = .01$) against Acute Kidney Injury Network stage 1 (and with a strong trend in Acute Kidney Injury Network stages 2 and 3), off-pump surgery failed to prevent dialysis or renal replacement therapy at 30 days. Furthermore, Garg and associates⁴ have unequivocally demonstrated from the Coronary Artery Bypass Surgery Off or On Pump Revascularization Study (CORONARY) trial that AKI after on-pump or off-pump coronary artery bypass grafting does not increase the risk of dialysis

or renal replacement therapy at 1 year. A smaller and nonrandomized trial by Schopka and colleagues⁵ is plagued with a weak methodology and is not relevant to this topic.

Therefore, because AKI appears to be nonpredictive of dialysis and reversible at 1 year, we can ask the following logical questions: Should AKI after cardiac surgery be an outcome of interest to surgeons? Why bother? The answer should be one of caution. Any inflammatory process or injury to the kidney function severe enough to produce AKI should not be taken lightly. A follow-up of 1 year remains short, and the final follow-up of the CORONARY study at 5 years (available in early 2016) should shine more light on this topic. Surgeons should be cautious with trials that use AKI as part of the main outcome, however, as we now know that AKI is not an outcome of comparable severity and prognosis to renal dialysis, death, myocardial infarction, stroke, or revascularization.

Nevertheless, AKI remains an important injury to the kidney function, and proper risk assessment (now including obesity) and appropriate postoperative fluid management are mandatory. Various pharmacologic agents are currently being tested in large cardiac surgery trials, and their results

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Central Message

Obesity appears to be a risk factor for AKI after cardiac surgery. But is AKI an outcome of interest for surgeons?

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may change the future treatment of AKI after cardiac surgery.

References

1. Lu Q, Feng J, Zhou J, Zhao Z, Li H, Teng Z, Jing Z. Endovascular repair by customized branched stent-graft: a promising treatment for chronic aortic dissection involving the arch branches. *J Thorac Cardiovasc Surg*. 2015;150:1622-8.
2. Lamy A, Devereaux PJ, Prabhakaran D, Taggart DP, Hu S, Paolasso E, et al; CORONARY Investigators. Off-pump or on-pump coronary-artery bypass grafting at 30 days. *N Engl J Med*. 2012;366:1489-97.
3. Lamy A, Devereaux PJ, Prabhakaran D, Taggart DP, Hu S, Paolasso E, et al; CORONARY Investigators. Effects of off-pump and on-pump coronary-artery bypass grafting at 1 year. *N Engl J Med*. 2013;368:1179-88.
4. Garg AX, Devereaux PJ, Yusuf S, Cuerden MS, Parikh CR, Coca SG, et al; CORONARY Investigator. Kidney function after off-pump or on-pump coronary artery bypass graft surgery: a randomized clinical trial. *JAMA*. 2014;311:2191-8. Erratum in: *JAMA*. 2014;312:97.
5. Schopka S, Diez C, Camboni D, Floerchinger B, Schmid C, Hilker M. Impact of cardiopulmonary bypass on acute kidney injury following coronary artery bypass grafting: a matched pair analysis. *J Cardiothorac Surg*. 2014;9:20.