The Impact of Renal Function on Outcomes of Bariatric Surgery

George L. Blackburn* and Greta Magerowski†

*Center for the Study of Nutrition Medicine and †Center for the Study of Nutrition Medicine, Department of Surgery, Beth Israel Deaconess Medical Center, Boston, Massachusetts

In this issue of JASN, Turgeon et al.1 offer new insights into the relationship between complications from bariatric surgery and kidney function measured by GFR. They report a positive correlation between stage of kidney disease and complication rate. Given significantly higher complication rates in weight loss surgery patients, they recommend careful consideration of potential adverse effects. At the same time, they acknowledge that benefits may outweigh the higher risks of bariatric surgery in these cases.

The public health crisis of obesity in America has fueled growth in the number of candidates for bariatric procedures.2 At the same time, improved safety measures and greater surgical precision have led to a decline in complication rates. This has enabled weight loss surgery to be performed in previously unqualified patients. Among these are diabetic individuals3 with a body mass index <35 kg/m2.

As the number of procedures in patients with CKD increases, treatment guidelines will develop. These will reduce the risk of complications while allowing access to the advantages of surgery, including successful weight loss and improved parameters of kidney function.

Nonetheless, a number of problems still hinder understanding of the risk-to-benefit ratio of bariatric surgery in CKD patients. Turgeron et al. used estimated GFR to classify patients by CKD stage. However, there has been increasing debate over the use of GFR as a marker of kidney function in the obese population.4 Controversy centers on which equation best estimates GFR and whether it should be adjusted to account for the higher average body surface area (BSA) in these patients (1.9 m2).

Indexing GFR according to the standard BSA of 1.73 m2 underestimates the rate in patients with larger BSAs. Nair et al.5 also found that the Modification of Diet in Renal Disease (MDRD) equation, which uses an index of 1.9 m2, also underestimated GFR in diabetic patients with obesity. Although no estimated GFR equation has been validated,6 Michels et al.7 reported that the CKD-Epi formula outperformed both the Cockroft-Gault and MDRD in accurately estimating GFR in obese populations.

GFR tends to be underestimated in obese patients, including those with diabetes. Indeed, debate is ongoing over whether creatinine-based or cystatin C-based GFR estimation is more accurate in these patients.8 A way to accurately estimate GFR in weight loss surgery patients is needed to assess kidney function before and after procedures. However, that goal is elusive, complicated by both body size and the body composition changes that occur as a result of surgery.9

Although there is no perfect way to determine kidney function using GFR, Turgeon et al. show that kidney status has a profound impact on surgical outcomes. Effective measurement can help identify and prevent complications. It can also serve as a means by which clinicians can determine the type of surgery that will provide the best balance between risks and potential gains.

Malabsorptive surgeries can lead to kidney failure even in patients without prior renal dysfunction because of increased hyperoxaluria.10,11 In one report on Roux-en-Y gastric bypass (RYGB), 7.65% of RYGB patients developed hyperoxaluria compared with only 4.63% of controls.10 However, gastric banding or sleeve gastrectomy do not increase urinary oxalate excretion.12,13 Purely restrictive procedures are less likely to result in the development or exacerbation of CKD.14

Although restrictive procedures have lower complication and mortality rates, RYGB has the best weight loss outcomes.15 For patients with CKD, trading greater weight loss for increased risk may be the best option. Weight loss after bariatric surgery is associated with a number of improvements that can help resolve kidney disease—even ESRD, eliminating the need for transplantation.14

Bariatric surgery improves underlying causes of CKD (dyslipidemia, hypertension, urinary albumin excretion, atherosclerosis, and metabolic syndrome). It can also improve measures linked to kidney function (insulin resistance, adiponectin, TNF-α, IL-18, and C-reactive protein).16,17 For patients attempting to meet kidney transplant requirements through surgical weight loss, RYGB may provide the quickest and best weight loss outcomes. It is the most commonly performed procedure in patients with obesity and CKD; it enables them to undergo transplantation.18

Bariatric surgery in CKD patients requires a careful balance of risks and benefits.19,20 High-quality controlled trials
are needed to identify and quantify those risks and benefits. To improve options for predicting surgical risk on a case-by-case basis in patients with obesity and diabetes, studies of GFR estimation techniques are necessary.

DISCLOSURES
None.

REFERENCES