Indexing for 1.73-m² Body Surface Area yet a Basic Mistake for Assessing Estimated Glomerular Filtration Rate After Bariatric Surgery

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Dear Editor,

I read with considerable interest the article by Hung et al. [1], exploring the impact of anemia on kidney function after bariatric surgery. However, there are some aspects that may influence the reliability of the results from this and other comparable studies.

In the mentioned study, the course of postoperative estimated glomerular filtration rate (eGFR) was assessed using creatinine-based chronic kidney disease epidemiology collaboration (CKD-EPI) equation expressed in mL/min per 1.73 m². The main logic behind indexing eGFR for 1.73 m² body surface area (BSA) is to compare eGFR among subjects with various body shapes. Researchers should keep in mind that the common eGFR equations, such as the modification of diet in renal disease study (MDRD) and the CKD-EPI, were neither developed nor validated in populations with severe obesity, and one should be cautious with reporting eGFR indexed for BSA in subjects with abnormal anthropometric data, since these values lead to underestimation of the actual GFR in patients with extreme body size [2].

Nevertheless, among patients with extreme BSA, the values of eGFR indexed for BSA are always biased in the same direction, i.e., downward bias; therefore, cross-sectional comparison of eGFR indexed for BSA in patients with severe obesity, such as prior to bariatric surgery, may still be acceptable. I believe that the problem of indexing eGFR for 1.73 m² BSA is especially the case for longitudinal follow-up of the same patients' eGFR before and after significant weight loss, since the level of bias changes while the number of nephrons remains constant. The literature recommends removal of

indexing for BSA by multiplying eGFR by BSA/1.73, in order to develop a solution to this problem.

On the other hand, I should note that despite in cross-sectional settings deindexing of eGFR from 1.73 m² BSA mitigates the bias of an extreme BSA, it is not still sufficient in follow-up studies. That is due to modification of the serum levels of the two common endogenous markers, creatinine and cystatin C, following significant loss in body lean and fat mass after bariatric surgery, respectively.

Researchers should be aware that reliable changes in kidney function after bariatric surgery can only be achieved by measuring GFR values obtained according to the clearance of exogenous filtration tracers.

Compliance with Ethical Standards

Conflict of Interest The author declares that he has no conflict of interest.

References

1. Hung K-C, Wu S-C, Chang Y-J, et al. Impact of preoperative Anemia on postoperative kidney function following laparoscopic bariatric surgery. *Obes Surg.* 2019;1–8.
2. Chang AR, Zafar W, Grams ME. Kidney function in obesity—challenges in indexing and estimation. *Adv Chronic Kidney Dis.* 2018;25(1):31–40.

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