Donor's Versus Recipient's Demographic Data for Estimating Kidney Function in Kidney Transplant Recipients

Dear Editor,

Estimated glomerular filtration rate (eGFR) is clinically used to evaluate the level of kidney function and approximating maintenance doses of drugs that are renally eliminated.

Most commonly used equations for eGFR calculation are the chronic kidney disease epidemiology collaboration, modification of diet in renal diseases, and Cockcroft-Gault. These three formulas use serum creatinine concentration to estimate GFR.[1] All these equations, although with different accuracies, can be applied to estimate drug dosing.[1]

In kidney transplant recipients, allograft rejection and drug-induced nephrotoxicity are the two persistent threats that necessitate kidney function monitoring. Some investigators have assessed the accuracy of commonly used eGFR equations in kidney transplant recipients. One can conclude that they have used recipients' age, weight, and gender in these eGFR formulas since there is no mention of the donors' data in those studies.[2,3] They noted that predictive performances of many eGFR equations are modest in kidney transplant recipients, while biases may significantly be associated with recipients' demographic characteristics including body mass index, age, and sex.[2,3]

These discrepancies may in part be due to the using of recipients' biometric data without considering donor's demographic data for estimating GFR. Patients' demographic characteristics including age, sex, race, and weight are usually considered in eGFR equations since they represent interindividual variations in muscle mass and creatinine production.[2,3] Age is a physiologic factor that affects GFR as well as creatinine production and tubular secretion.[4] In addition, pathologic conditions that are common in older patients (such as diabetes and atherosclerosis) as well as physiologic senescence may alter the accuracy of GFR estimates.[4]

Although not clearly mentioned in the method sections of most studies, one can conclude that all of those studies included demographic characteristics of the kidney transplant recipients in the eGFR equations. Considering the role of age on serum creatinine production may justify the use of recipient's age in equations; however, considering the age of the kidney, donor's age may also need to be taken into account. It seems that evaluating eGFR of paired kidneys from a single donor in two different recipients at different time points after transplantation would be worthy in future studies to assess the role of donors' demographic data on eGFR.

Multiple other factors influence the serum creatinine concentration in kidney transplant recipients. For example, trimethoprim that is administered as a component of cotrimoxazole® for prophylaxis of *Pneumocystis jiroveci* pneumonia inhibits tubular secretion of creatinine. Corticosteroids that are usually administered as induction and maintenance immunosuppressive regimen induce muscle wasting and affect creatinine generation.[5] Hence, higher doses of steroids within the 1st day after transplantation and lower doses later may alter serum creatinine concentrations. Therefore, developing new eGFR equations for use in kidney transplant recipients by including demographic data of the donor, drugs types, and steroid dose may be necessary to optimize the accuracy of eGFR in this population.

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There are no conflicts of interest.

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