



4CPS-159: ESTIMATING RENAL FUNCTION FOR DRUG DOSING: CORRELATION BETWEEN CKD-EPI AND COCKCROFTGAULT IN AN ELDERLY POPULATION

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Background and Importance

Estimates of **glomerular filtration rate (eGFR)** should provide accurate measure of an individual's kidney function. This is even more important in old people since there is age-related physiological change in the kidney, which could lead to reduced GFR. The overestimation of GFR may lead to **drug toxicity** and the underestimation may lead to sub-therapeutic drug levels. (1,2)

Use of multiple equations to evaluate renal function can lead to differences and corresponding drug dosing regimens. The **Cockcroft-Gault (CG)** equation, despite inaccurate in the elderly, remains the most widely used equation for determining the creatinine clearance (CrCl). On the other hand, estimation of GFR using the **CKD-EPI** has gained increasing acceptance. (1,3) This formula is used to classify chronic kidney disease. (4)

Aim and Objectives

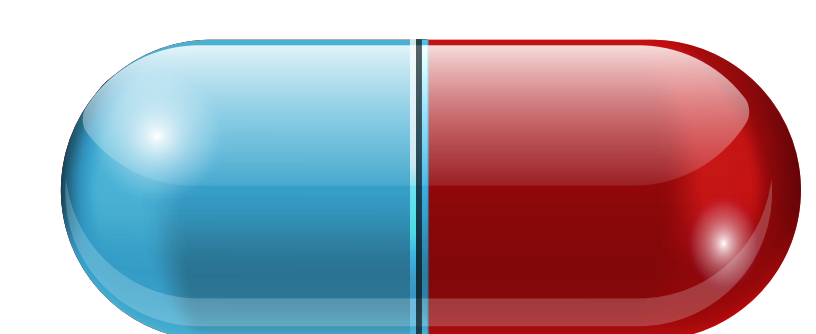
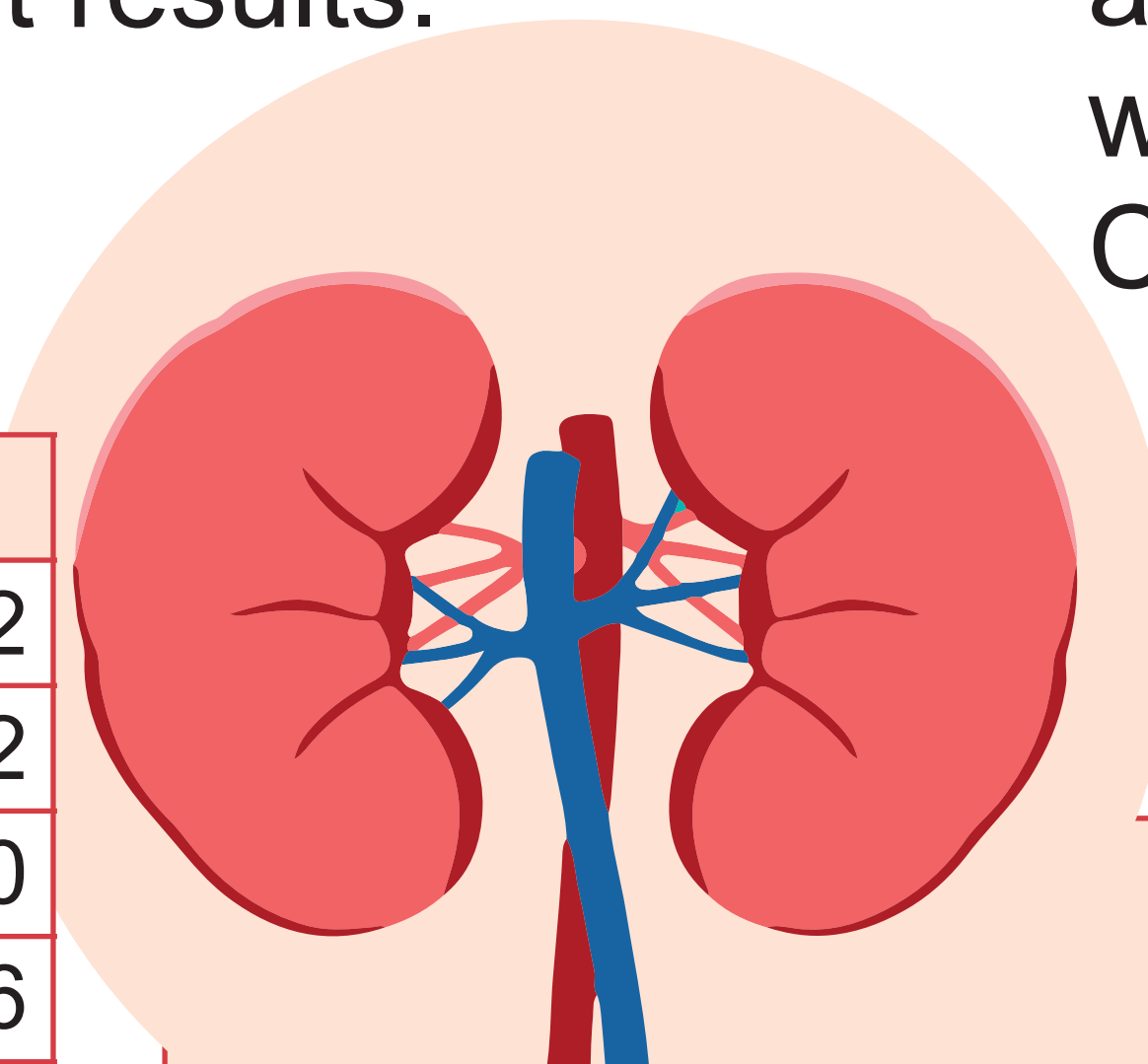
To determine the correlation between estimated CrCl by CG with eGFR by CKD-EPI. Additionally, we have compared the differences among dose adjustments recommendations and evaluated the patient's profile in the most discrepant results.

Material and Methods

The study included hospitalized patients in the Medicine ward aged 70 and above with prescriptions of enoxaparin, meropenem, amoxicillin + clavulanate and piperacilin + tazobactam. Demographic data and serum creatinine (SrCr) were collected. CrCl was calculated using CG equation and eGFR by CKD-EPI 2021 equation.

Results

Population characteristics	
Number of patients	32
Men	12
Women	20
Mean age (years)	85,6
Mean serum creatinine (mg/dl)	1,71
Number of Enoxaparin prescriptions	26
Meropenem prescriptions	8
Number of Amoxicillin + clavulanate acid prescriptions	3
Piperacillin and tazobactam prescriptions	2



Population characteristics of patients with different drug dosing recommendation

Age	SrCr (mg/dL)	Weight (kg)	Height (cm)	CrCl CG (mL/min)	GFR CKD (ml/min/1.73m ²)	Prescription
92	1,24	50	155	22,85	40,83	Enoxaparin +Meropenem
94	1,33	53	150	21,64	37,07	Amoxicillin + clavulanate
81	1,6	65	160	28,3	32,2	Enoxaparin
91	2,24	80	170	24,31	27	Meropenem

Conclusion and Revelance

In only four patients did difference in the estimation of renal function using the two equations, leading to different drug dosing recommendation. One patient had both enoxaparin and meropenem prescribed, all others only one drug. It seems that it is safe to use the CKD-EPI equation to drug dosing, with caution in patients with extreme weight and age characteristics. Future studies should extend to a greater number of patients and include other drugs with adjustment to renal function. In order to validate the estimated renal function and understand which formula is closest to reality, it would be important to determine the measured GFR. Controversy remains as to whether adoption of eGFR for drug dosing is appropriate given that dosing recommendations for many available drugs are based on CG estimates of kidney function. Using the same kidney function estimate for management of kidney disease, drug development and dosing would harmonize all clinical areas.

References

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