Kidney Function Assessment In Geriatric Patients

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Introduction

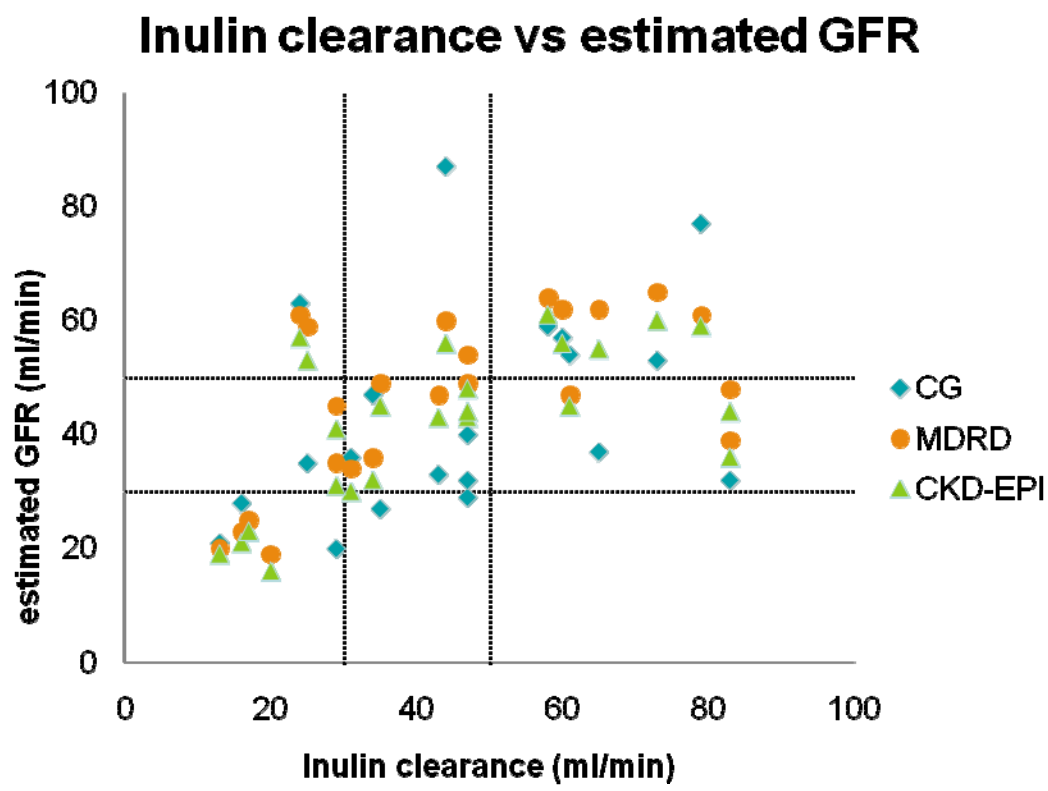
The gold standard to measure the glomerular filtration rate (GFR) of the kidneys is inulin clearance. Various methods exist for estimating GFR, usually based on serum creatinin. The most widely used methods are the Cockroft-Gault (CG) and Modification of Diet in Renal Disease (MDRD) equations. The objective of this study was to determine the best method to estimate GFR in geriatric patients.

Methods

From January until December 2010 inulin clearance was determined in 24 geriatric patients using the Inutest single shot method with measurements during 8 hours. Information about age, gender, race, height, weight, medication use, and comorbidities were collected. Serum creatinin, cystatin C, ureum and albumin values were determined just before the inulin infusion. A comparison was made between inulin clearance and the CG, MDRD (short version), and the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equations. The correlation coefficients between these methods and the inulin clearance were calculated.

Results

Mean age of the study population was 81 years (range 71-91), 62% was female. Mean GFR measured was 44 ml/min (range 13-83). The correlations and mean differences are described in Table 1. The CKD-EPI and MDRD equation correlated similar (0.60 vs 0.59). The MDRD slightly underestimates the true GFR, and the CKD-EPI slightly overestimates the true GFR. The range of mean differences varied widely in all methods.



<30 ml/min = severe renal impairment
30-50 ml/min = moderate renal impairment
>50 ml/min = mild renal impairment to normal renal function

Table 1. Correlations and differences

		CG	MDRD	CKD-EPI
Inulin	Pearson correlation	0.44	0.59	0.60
	Sig. (2-tailed)	<0.05	<0.05	<0.05
	Mean difference ml/min (range)	3 (-43 - 51)	-2 (-37 - 44)	2 (-33 - 47)

Conclusions

- MDRD and CKD-EPI estimate GFR similar; both perform slightly better than CG.
- Although at mean the equations estimate GFR well, at individual level they may differ widely
- However, the individual estimations predict the categorized severity of renal impairment (mild to severe) rather well.

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