MDRD versus CKD-EPI Equation to estimate Glomerular Filtration Rate in Kidney Transplant Recipients

I. Masson, M. Flamant, N. Maillard, E. Cavalier, O. Moranne, E. Alamartine, C. Mariat, P. Delanaye

Department of Nephrology-Dialysis-Transplantation, University of Liège, CHU Sart Tilman, Liège, Belgium

Objectives:

The new Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) creatinine-based equation was developed to address the systematic underestimation of the glomerular filtration rate (GFR) by the Modified of Diet in Renal Disease (MDRD) study equation in patients with a relatively well-preserved kidney function.

The objective of this study was to *compare the performances of the MDRD Study and CKD-EPI equation* in a large cohort of transplant patients for whom GFR was evaluated either by urinary clearance of inulin or plasma clearance of ^{51}Cr-EDTA.

Methods:

We analyzed the performances of the CKD-EPI equation in comparison to the MDRD Study equation in *825 stable kidney transplant recipients*. Bias, precision and accuracy within 30% of true GFR were determined. GFR was measured by urinary clearance of inulin (n=488) and plasma clearance of ^{51}Cr-EDTA (n=337).

Results:

Demographics

Characteristic	Population (n=825)
Age (year)	52 ± 14 [19-83]
Male	539 (65)
Time post-transplantation (months)	48 ± 69 [3-360]
Weight (kg)	70 ± 15 [38-128]
Height (cm)	167 ± 10 [135-192]
Body mass index (kg/m²)	25 ± 5 [16-44]
≤25	457 (55)
25<BMI≤30	261 (32)
30<BMI	107 (12)
Diabetes	136 (16)
Urine protein rate(mg/day)	
<300	590 (72)
300-1000	182 (22)
>1000	53 (6)
Patients with steroid	381 (46)
Steroid dose (mg/day)	
0	444 (54)
1-10	363 (44)
>10	15 (2)
Patients with Calcineurin inhibitor	768 (93)
Creatinine (mg/dL)	1.49 ± 0.52 [0.41-3.88]
mGFR (mL/min/1.73m²)	50 ±17 [15-113]
Chronic Kidney Disease (CKDT) stage	
1. GFR≥90 mL/min/1.73m²	13 (2)
2. GFR 60-89 mL/min/1.73m²	218 (26)
3. GFR 30-59 mL /min/1.73m²	495 (60)
4. GFR 15-29 mL /min/1.73m²	100 (12)
GFR with plasma ^{51}Cr-EDTA	337 (41)
GFR with inulin	488 (59)

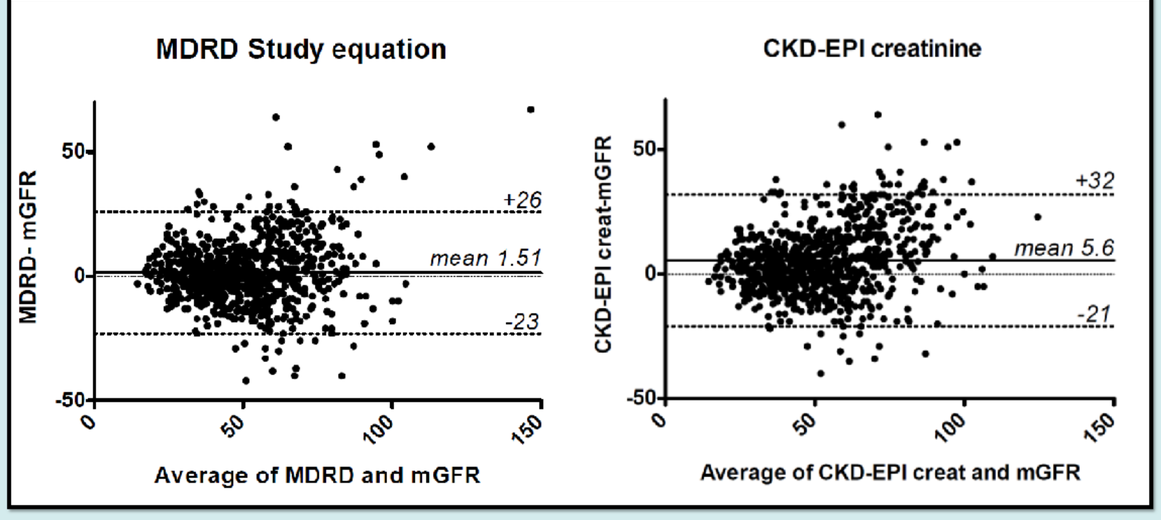
Note: Values expressed as mean ± SD [range] or number (percent).

Predictive Performances

GFR estimates	Bias		Precision (mL/min/1.73m²)	Accuracy 30%
	Absolute (mL/min/1.73m²)	Relative (%)		
MDRD study equation				
Whole cohort	*+2[1.1-2.8] **	*+6[4-8]**	*13*	*80[77.3-82.7] **
GFR<60 mL/min/1.73m²	+3*	+10*	11	78*
GFR 60-90 mL/min/1.73m²	-2*	-3*	15	86*
GFR >90 mL/min/1.73m²	-9	-9	25	85
CKD-EPI creat equation				
Whole cohort	*+6 [5.1-6.9]*	*+ 14[12-16]*	*14*	*74 [71-77]*
GFR<60mL/min/1.73m²	+6	+17	12	72
GFR 60-90 mL/min/1.73m²	5	7	16	78
GFR >90 mL/min/1.73m²	-3	-3	16	92

Values expressed as mean [CI 95%]; * : p<0.05

Bland and Altman Plots



Conclusions:

The *CKD-EPI creatinine equation does not offer a better GFR prediction* in renal transplant patients as compared to the MDRD Study equation, even in the higher CKD stages.

50ERA-EDTA 677--SP

Transplantation - clinical studies II

Ingrid MASSON

DOI: 10.3252/pso.eu.50era.2013

Poster presented at: ERA-EDTA 50th Congress Istanbul, Turkey May 15-21, 2013

PosterSessionOnline.com