estimate glomerular filtration in the general population: impact on the epidemiology of chronic kidney disease

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Background:

Chronic kidney disease (CKD) is a major issue in public health. Its prevalence has been calculated using estimation of glomerular filtration rate (GFR) by the creatinine-based equations developed in the Modified Diet in Renal Disease (MDRD) and Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) study. Recently, new equations based either on cystatin C (CKD-EPI Cys) or both cystatin and creatinine (CKD-EPI mix) have been proposed by the CKD-EPI consortium. The aim of this study was to measure the difference in the prevalence of stage 3 CKD, defined as an estimated GFR less than 60 mL/min/1.73 m², in a population using these four equations.

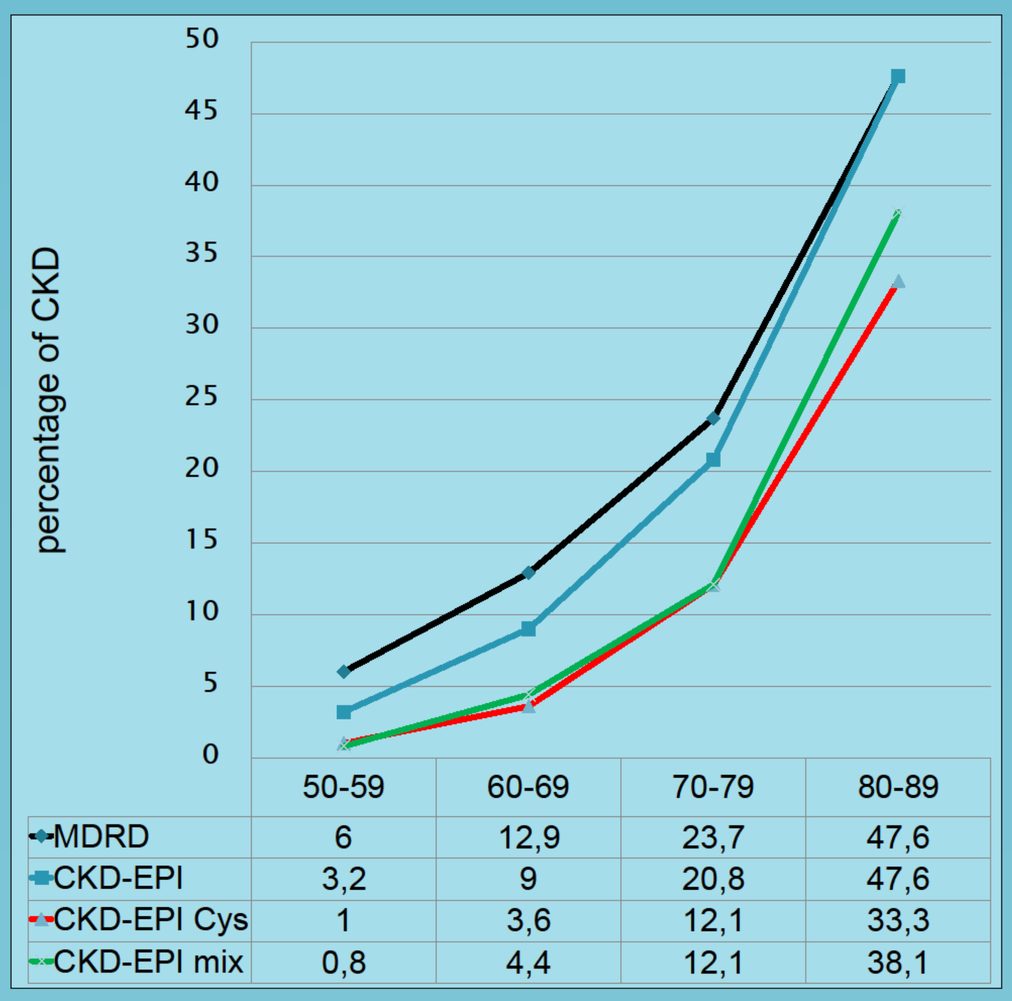
Methods :

CKD screening was performed in the Province of Liège, Belgium. On a voluntary basis, people aged over 50 years have been screened. GFR was estimated by the four equations. Stage 3 CKD was defined as a GFR less than 60 mL/min/1.73 m².

N = 4189	Mean	SD	Range
Age (years)	63	7	50-96
% men (%)	46.7		
Weight (Kg)	75	15	31-156
Height (cm)	167	9	102-197
BMI (Kg/m²)	27	5	13-60
Diabetes (%)	11.9%		
Hypertension (%)	47.2%		
Current smoking	18.2%		
Creatinine (mg/dL)	0.89	0.21	
Cystatin C (mg/L)	0.85	0.17	
MDRD (mL/min/1.73 m²)	78	17	
CKD-EPI (mL/min/1.73 m²)	81	15	
CKD-EPI Cys (mL/min/1.73 m²)	92	17	
CKD-EPI mix (mL/min/1.73 m²)	88	16	

Results :

The screened population consisted of 4189 people (47% were men, mean age 63±7y). Their mean serum creatinine and plasma cystatin C levels were 0.88±0.21 mg/dL and 0.85±0.17 mg/L, respectively. The prevalence of CKD in this population using the MDRD, the CKD-EPI, the CKD-EPI Cys and the CKD-EPI mix equations was 13%, 9.8%, 4.7% and 5%, respectively. The prevalence of CKD was significantly higher with the creatinine-based (MDRD and the CKD-EPI) equations compared to the new cystatin C-based equations.



	50-59	60-69	70-79	80-89
MDRD	6	12,9	23,7	47,6
CKD-EPI	3,2	9	20,8	47,6
CKD-EPI Cys	1	3,6	12,1	33,3
CKD-EPI mix	0,8	4,4	12,1	38,1

Conclusion :

Prevalence of CKD varies strongly depending on the method used to estimate GFR. Such discrepancies are of importance and must be confirmed and explained by additional studies, notably by studies using GFR measured with a reference method.

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