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## BACKGROUND

- The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation has been recently proposed
- It has been demonstrated by several reports that it estimates glomerular filtration rate (GFR) more accurately than the Modification of Diet in Renal Disease (MDRD) Study equation.
- We investigated the metabolic and inflammatory parameters, and assessed the risk prediction for metabolic syndrome using each equation in a healthy Korean population.

## METHODS

- Data were analyzed from subjects who visited the Health Promotion Center at Chung-Ang University Hospital, Seoul, Korea from January to December in 2010.
- The estimated GFR (eGFR) was calculated using both the abbreviated Modification of Diet in Renal Disease (MDRD) study equation and the Chronic Kidney Disease Epidemiology Collaboration creatinine equation (CKD-EPI).
- The diagnosis of metabolic syndrome (MetS) was made according to the updated guidelines from the American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI)

## RESULTS

**Table 1.** Baseline characteristics

	Total (N=3,895)
Age, years	44.6 ± 10.8
Female/Male, n	1,853/2,042
BMI, kg/m <sup>2</sup>	23.2 ± 3.2
<b>Blood pressure, mmHg</b>	
Systolic BP	119.5 ± 14.9
Diastolic BP	71.2 ± 10.3
Glucose, mg/dl	93.5 ± 18.3
Triglyceride, mg/dl	107.2 ± 68.5
<b>HDL cholesterol</b>	
Female	56.9 ± 11.7
Male	49.1 ± 10.4
Albumin, g/dl	4.37 ± 0.25
Uric acid, md/dl	5.07 ± 1.39
Homocysteine, μmol/l	10.9 ± 4.4
High-sensitivity CRP, mg/l	1.76 ± 4.85
<b>Estimated GFR, ml/min/1.73m<sup>2</sup></b>	
MDRD	76.3 ± 11.0
CKD-EPI	86.0 ± 13.6
<b>CKD, n (%)</b>	
MDRD	204 (5.2)
CKD-EPI	74 (1.9)
MetS, n (%)	587 (15.1)

- The prevalence of CKD stages 3 to 5 was 5.2% when using the MDRD equation, but was lowered to 1.9% when using the CKD-EPI equation. Then, 3.3% of participants were excluded from CKD by the CKD-EPI equation.

**Table 2.** Comparison according to estimated GFR equation

	MDRD (n=204)	p-value	CKD-EPI (n=74)	p-value
Age, years	54.2 ± 10.8	<0.001	62.8 ± 11.0	<0.001
Female/Male, n	92/112	0.473	24/50	0.009
BMI, kg/m <sup>2</sup>	23.8 ± 3.1	0.008	24.1 ± 3.1	0.023
<b>Blood pressure, mmHg</b>				
Systolic BP	121.8 ± 16.4	0.027	123.8 ± 16.0	0.013
Diastolic BP	72.9 ± 10.7	0.021	71.8 ± 10.4	0.617
Glucose, mg/dl	97.9 ± 21.6	<0.001	106.2 ± 29.2	<0.001
Triglyceride, mg/dl	116.3 ± 71.0	0.051	130.4 ± 74.2	0.003
<b>HDL cholesterol</b>				
Female	56.7 ± 12.5	0.867	51.3 ± 12.3	0.017
Male	49.4 ± 11.1	0.756	49.0 ± 11.9	0.923
Albumin, g/dl	4.36 ± 0.26	0.885	4.30 ± 0.32	0.013
Uric acid, md/dl	5.62 ± 1.56	<0.001	6.04 ± 1.78	<0.001
Homocysteine, μmol/l	13.1 ± 4.9	<0.001	13.9 ± 4.9	<0.001
High-sensitivity CRP, mg/l	1.90 ± 7.00	0.679	2.94 ± 11.54	0.035
MetS, n (%)	45 (22.1)	0.006	23 (31.1)	<0.001

\* P-value was compared with non-CKD population

- We assessed the odds ratio of CKD according to each estimated GFR for MetS by Logistic regression analysis.

**Table 3.** Odds ratio (OR) for metabolic syndrome

	Odds ratio (95% CI)	p-value
<b>MDRD</b>		
Non-CKD	1 (Reference)	
CKD	1.64 (1.17 – 2.32)	0.005
<b>CKD-EPI</b>		
Non-CKD	1 (Reference)	
CKD	2.60 (1.58 – 4.30)	<0.001

## CONCLUSIONS

The metabolic and inflammatory parameters tended to deviate more from normal range in participants with CKD when using the CKD-EPI equation and it also assessed the risk of metabolic syndrome more accurately than the MDRD equation.

