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Reclassification of Chronic Kidney Disease Stage Using Cystatin CBased eGFR in a Mongolian Screening Population

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Objectives : Serum creatinine is the most commonly used marker for estimating glomerular filtration rate, but it is influenced by muscle mass and other non-renal factors. Cystatin C has been proposed as an alternative filtration marker that may improve risk assessment. However, its clinical relevance in preventive screening populations remains unclear, particularly in Central Asian countries.
Methods : We conducted a cross-sectional study of 684 adults who undergoing routine preventive health examinations in Mongolia. Estimated glomerular filtration rate was calculated using the Chronic Kidney Disease Epidemiology Collaboration creatinine equation and a cystatin C–based equation. Agreement between the two methods was evaluated using Pearson correlation, paired t-test, Bland–Altman analysis, and Cohen's kappa statistics. Multivariable logistic regression analysis was performed to identify factors associated with stage reclassification.
Results : Creatinine- and cystatin C-based estimated glomerular filtration rate showed moderate correlation ($r = 0.676$, $p < 0.001$). The mean difference between the two methods was −5.7 ml/min, with limits of agreement ranging from −36.9 to +25.5 ml/min, indicating substantial variability between individuals. A clinically meaningful discrepancy of ≥20 ml/min was observed in 5.1% of participants and was more frequent among individuals younger than 40 years (12.0%, $p < 0.001$). Despite the modest mean difference, CKD stage classification differed significantly between methods ($p < 0.001$). Overall, 27.6% of participants were reclassified into a different stage when cystatin C–based estimation was applied. Agreement between stage classifications was fair ($\kappa = 0.338$, $p < 0.001$). Cystatin C–based eGFR identified additional individuals with reduced kidney function who were not classified as having CKD using creatinine alone.
Conclusions : In a preventive screening population of Mongolian adults, cystatin C-based estimation substantially altered chronic kidney disease stage classification despite a modest mean difference compared with creatinine-based estimation. Cystatin C may improve early risk stratification, particularly in individuals with preserved kidney function.

Figure 1.png

Reclassification	**N**	**%**
No stage change	495	**72.4%**
Stage changed	189	**27.6%**

Figure 1.png

Creatinine Stage	Cys stage ≥90	Cys stage 60–89	Cys stage 30–59	Cys stage <30
≥90	421	131	14	0
60–89	22	67	19	0
30–59	0	2	5	1
<30	0	0	0	2