

# Renal Equations Using Cystatin C and Creatinine in Correlation to Lipids in Chronic Kidney Disease - A Cross-Sectional Study

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## Abstract

### Aim

To study and compare the association between estimated GFR with cystatin-C and serum creatinine and the lipid profile in chronic kidney disease.

### Background

Chronic kidney disease (CKD) is frequently complicated by the coexistence of cardiovascular (CV) events, making it essential to identify CV risk in CKD. Serum cystatin-C is an upcoming renal biomarker, which is used to measure estimated glomerular filtration rate (eGFR) by the CKD-EPI formula.

### Methods

This cross-sectional study, comprising of 120 CKD patients, attempted to determine, which of the two equations for estimating GFR, either by serum cystatin-C or by serum creatinine, is better related with lipid profile which is widely portrayed as a cardiovascular risk factor. The parameters evaluated included lipid profile, serum creatinine and serum cystatin-C among others. Staging was done by both the equations (MDRD equation by creatinine and CKD-EPI equation by cystatin-C) and compared, and both the eGFRs were correlated with the lipid profile.

### Results

eGFR estimation by cystatin-C was found to relate inversely and significantly with lipid profile which included-TC, TG, LDL, VLDL ( $r = -0.19, -0.23, -0.18, -0.23$ ;  $p < 0.05$  respectively) and lipid ratios TC/HDL, LDL/HDL ( $r = -0.26, -0.24$ ;  $p < 0.01$  respectively). Lipid profile except HDL was found to correlate negatively and significantly with eGFR estimation by serum cystatin-C ( $p < 0.05$ ). Lipid ratios- TC/HDL and LDL/HDL were also found to correlate inversely and significantly ( $p < 0.01$ ). However, eGFR using serum creatinine failed to offer a similar significant relation.

### Conclusion

Serum cystatin-C based eGFR was found to be better correlated with the lipid profile, when compared with eGFR estimation using serum creatinine. Hence, the correlation between cystatin-C based eGFR and lipids might indicate that this eGFR methodology may be a better marker of cardiovascular risk as lipids are a well-known traditional risk factor for cardiovascular disease.

**Keywords:** Cystatin C, Renal insufficiency, Estimated glomerular filtration rate, MDRD equation, CKD-EPI equation, Cardio-renal disease, Cardiovascular risk, Lipid profile