SERUM CYSTATIN C AS A MARKER IN THE ASSESSMENT OF RENAL FUNCTION IN PATIENTS WITH RETINOPATHY AND MILD TO MODERATE DIABETIC NEPHROPATHY

BY

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Serum Cystatin C as a marker in the assessment of renal function in patients with retinopathy and mild to moderate diabetic nephropathy
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ABSTRACT

Introduction: Serum cystatin C (CysC) has been described as a promising marker of GFR. However there are no literature on performance of CysC in nephropathy and retinopathy (DR), in Sri Lankan type 2 diabetic patients (T2DM).

Objectives: To determine correlation between serum CysC and Serum Creatinine (SCr), Albumin to Creatinine Ratio (ACR), and estimated glomerular filtration rate based on Modification of Diet for Renal Disease study equation (eGFR-MDRD) in both T2DM patients and healthy adults, to compare CysC levels in T2DM subjects with mild to moderate diabetic nephropathy with age and gender matched healthy individuals and also to identify the correlation of DR in those selected T2DM patients with Cys, SCr, eGFR-MDRD and ACR.

Methods: Sixty one T2DM patients with possibility of mild to moderate renal impairment, and 118 apparently healthy adults, between 30-60 years were enrolled. Out of the 118 healthy adults, 61 were age and gender matched with the T2DM patients. Retinopathy status was assessed by slit lamp examination. SCr and CysC and urine creatinine and albumin were measured. ACR and eGFR-MDRD, eGFR- Chronic Kidney Disease Epidemiology Collaboration (CKD EPI) were calculated.

Results: CysC significantly correlated with SCr and eGFR –MDRD in both T2DM patients and healthy adults but was stronger in the T2DM patients. CysC significantly
correlated with ACR severity categories only in T2DM patients with a significant stepwise increase of CysC according to degree of albuminuria. The T2DM patients (n=61) had higher CysC than the matched controls. Both T2DM patient groups with moderate diabetic nephropathy (n=21) and microalbuminuria (n=22) had higher CysC than the respective matched healthy control groups (p<0.05). Only the ACR categories showed a significant correlation with DR categories (P<0.05). CysC cut off value for the diagnosis of moderate renal impairment was 0.98mg/L (sensitivity of 85.7%, specificity of 82.5%) and for albuminuria (ACR >30mg/g) was 0.96 mg/L (sensitivity of 73.3% and a specificity of 80.6%). Only CysC could differentiate the moderately increased chronic kidney disease (CKD) risk prognosis category from the absent/low CKD risk category (p < 0.05). The reference intervals for the healthy adults for < 50 years of age for male and females are 0.62 – 1.01 mg/L and 0.54 – 0.90 mg/L respectively while for > 50 years of age for males and females are 0.65 – 1.12 mg/L and 0.60 – 1.01 mg/L respectively.

**Conclusion:** CysC may be used as a reliable renal function marker in T2DM patients with mild to moderate diabetic nephropathy and it is also useful in early detection of poor prognosis in CKD. ACR may be able to predict DR status in T2DM patients. Our study suggests that screening for low GFR with CysC in a low-risk population is probably not worthwhile. In healthy adults, gender based reference intervals for less than 50 year and more than 50 years of age are suggested.
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