METALLOTHINEIN RESPONSES IN RELATION TO DISEASE PROGRESSION IN CKD AFFECTED PEOPLE OF PADAVIYA, SRI LANKA

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Metallothioneins (MT) are metal detoxifying proteins that sequester metals. MT expression is induced by metals such as As, Cd, and Zn. In a cross sectional study, metallothionein expression was followed in chronic kidney disease (CKD) affected people in Padaviya area to investigate whether the disease is etiologically linked to metal exposure. Male subjects between 35-75 years of age volunteered for the study (n=202) at CKD clinic, Base Hospital, Padaviya. Samples were collected similarly at Padalangala for a non-endemic control. Questionnaire based information, whole blood and spot urine samples were collected from each subject serum Creatinine and Cystatin C and urine Albumin to Creatinine ratio (UACR mg/g) were determined by standard analytical procedures. eGFR (ml/min-1.722m2) was calculated using MDRD and EPI equations. Protein expression levels of MT-1A and MT-2A genes were measured by enzyme linked immunosorbent assay using polyclonal mouse anti-human MT1A and monoclonal mouse anti-human MT2A antibodies respectively. Results showed that MT1A protein level of CKD stage II was statistically different ($p<0.05$, one way ANOVA followed by Tukey HSD) from both stages III ($p<0.002$) and IV ($p<0.004$) whereas MT2A protein levels were similar ($p>0.05$) among all stages and control. Simple linear correlation (Pearson's) analyses reveled that MT1A protein levels positively associated ($p<0.05$) with disease progression in terms of serum Cystatin C based (EPI) eGFR (r, 0.163) and serum Creatinine and Cystatin C combined equation based (EPI) eGFR (r, 0.171). Intra-stage analyses showed that MT1A protein level was positively correlated ($p<0.05$) to MDRD eGFR in stage II (r, 0.391), Cystatin C based EPI eGFR in stage III (r, 0.381) and UACR of 0-30 mg/g group (r, 0.284). In conclusion, MT-1A expression appears to be modulated with the disease progression in CKD patients in Padaviya area. The study continues.

Keywords: Metallothionein, Chronic Kidney Disease, Padaviya