Poster Abstracts

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URINARY BIOMARKERS KIM-1 AND NGAL FOR EARLY PREDICTION OF CHRONIC KIDNEY DISEASE OF UNCERTAIN ETIOLOGY (CKDU) AMONG AGRICULTURAL COMMUNITIES IN SRI LANKA

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Objectives: Chronic Kidney Disease of unknown aetiology (CKDu) is highly prevalent in Sri Lanka. It is majorly occurring in agriculture workers and do not exhibit any common causative factors such as hypertension, diabetes or other known etiologies. The study was to determine the prevalence of CKDu following WHO study group guidelines in kidney disease emerging locations of Hambantota district [Angunakolapelessa (EL1) and Bandagiriya (EL2)] and non-endemic locations Matara (CM) and Nuwara Eliya (CN) in Sri Lanka. Further, the study aimed to determine the levels of tubular injury markers kidney injury molecule (KIM-1) and neutrophil gelatinase-associated lipocalin (NGAL) in the same study populations to assess potential early renal injury among CKDu subjects and healthy farmers from the selected locations.

Methods: Male farmers (n = 1734) were recruited from four farming regions in Sri Lanka i.e. CM and CN (farming locations with no CKDu prevalence) and two CKDu emerging locations from Hambantota district i.e. EL1 and EL2. Albuminuria (ACR ≥ 30mg/g); serum creatinine based estimation of glomerular filtration rate (eGFR); HbA1c; hypertension; creatinine normalized urinary KIM-1 and NGAL were measured using ELISA. Statistical analysis was performed using IBM statistics (v23). In all analysis, $p<0.05$ was considered as significant.

Results: Fourteen new CKDu cases (18 %) from EL1 and nine CKDu cases (9%) from EL2 were recognized for the first time from Hambantota District. Persistent albuminuria (ACR ≥ 30mg/g Cr) was reported in new cases. No CKDu cases were identified in non-endemic study locations in CM and CN. Analysis of urinary biomarkers showed urinary KIM-1 and NGAL were significantly higher in new CKDu cases in EL1 and EL2. However, we also reported significantly higher levels of KIM-1 but not NGAL in apparently healthy farmers from EL1 and EL2 with comparison to both non-endemic control groups ($P < 0.05$). This may indicate the possible early proximal tubule damage even in the absence of persistent albuminuria. Our findings demonstrate the potential capabilities of urinary KIM-1 and NGAL in early prediction of renal injury among CKDu affected/emerging farming communities in Sri Lanka.

Conclusion: In conclusion, this study reported 23 new CKDu cases for the first time in Hambantota district, Sri Lanka regardless stating it as non-endemic location by WHO study group in the recent past. Furthermore, current study reported that the tubular damage predicted by urinary KIM-1 and NGAL were significantly correlated with high urinary ACR levels. Early tubular damage as seen by higher urinary KIM-1 and NGAL was also observed in healthy farmers despite normal ACR levels. However, longitudinal cohort studies are needed to predict the use of tubular markers for precise prognosis, optimized treatment and patient management.

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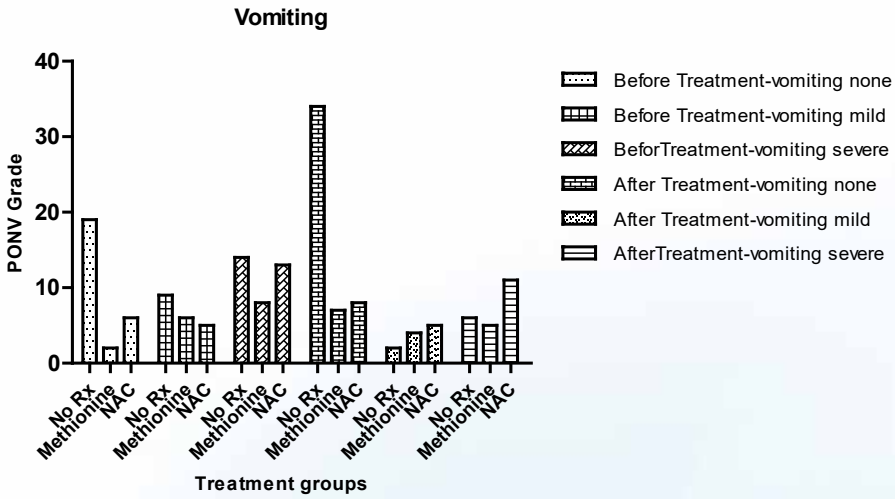

Figure 1

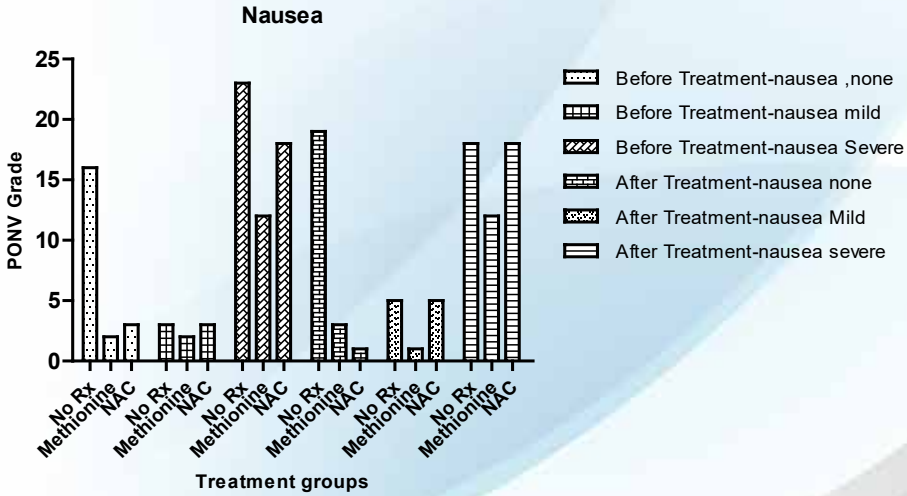

Figure 2