

## Emergent Risk of Sub-Clinical Renal Injury within Paediatric Communities in the Central Highlands of Sri Lanka: A Region where Chronic Kidney Disease of Unknown Aetiology is not Documented among Adults

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### Abstract

Concerning the impact of Chronic Kidney Disease of uncertain etiology (CKDu), central highlands in the wet climatic zone of Sri Lanka are considered to be safe, as CKDu is not reported among adults. However, being an agricultural area with intensive agrochemical usage, we hypothesized that there could be exposure-related renal health risks for the inhabitants. Hence, this study aimed to assess renal health of residential paediatric communities in this particular region in comparison to an age-matched control group from the low-country dry climatic zone. Within 12-18 years of age, 596 students (274 boys, 322 girls) from the central highlands of the wet climatic zone, and 488 students (229 boys, 259 girls) from the dry climatic zone participated in this cross-sectional study. Creatinine-adjusted median (interquartile range) urinary KIM-1 level of the participants in the wet-zone [0.2476(0.002 – 0.664) ng/mgCr] was significantly high ( $p < 0.0001$ ) compared to the participants in the dry-zone [0.0709 (0.002-0.232) ng/mgCr]. Participants in wet-zone showed significantly high ( $p = 0.0139$ ) urinary NGAL level [3.562(1.757 – 7.539) ng/mgCr] compared to the participants in the dry-zone [3.169 (1.602-5.847) ng/mgCr]. Moreover, significant elevation ( $p = 0.0024$ ) of urinary Albumin to Creatinine Ratio (ACR) level was observed in participants of the wet-zone [3.012(1.752 – 5.546) mg/g], compared to those of the dry-zone [2.589(1.565 – 4.194) mg/g]. The incidences of albuminuria ( $ACR \geq 30$  mg/g) were 2.9% and 1.2% among the participants in wet and dry climatic zones respectively. Significantly elevated urinary NGAL, ACR, and particularly KIM-1 which is a more reliable indicator of impaired kidney function, reflect preliminary evidence of a potential risk of subclinical renal injury among the residential paediatric communities in the central highlands in Sri Lanka. In-depth studies with longitudinal observations are warranted for characterization of the paediatric renal health risks comprehensively.

**Keywords:** *Albumin:creatinine ratio, Kidney injury, KIM-1, NGAL, Paediatric, Sri Lanka*