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High Fluoride Exposure may be Associated with Subclinical Renal Injury in Normoalbuminuric Children: A Case Study in Padavi Sripura, Sri Lanka

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High Fluoride exposure levels are supposed to be a risk factor for renal injury and chronic kidney disease of uncertain etiology (CKDu). However, fluoride exposure and its impact on renal health are not well understood in Sri Lanka, particularly among children. Hence the study aimed for a comparative assessment of renal health in children with high and low fluoride exposure. This cross-sectional study was conducted with the voluntary participation of 92 students of both sexes (12-17 years of age) in the CKDu endemic, Padavi Sripura education zone. Early morning midstream urine samples were analysed, and urinary albumin-creatinine ratio (ACR) and creatinine-adjusted urinary fluoride (UF) levels were used for interpretations. UF levels above the 75th percentile of their UF distributions were categorized to the high fluoride exposure group (Hex) while the others occupied the low-fluoride exposure group (Lex). The median (inter-quartile distance) UF levels of girls and boys were 1.301 (0.960-2.391) and 1.908 (1.278-3.524) mg/gCr respectively. The median ACR level (mg/g) of boys in Hex [3.696 (2.096-7.236)] was significantly higher ($p<0.0001$) than that of the boys in Lex [1.233 (0.746-1.814)]. Girls in the Hex reported significantly higher ($p<0.0001$) ACR [4.008 (2.697-5.573) mg/g] compared to the girls in Lex [1.576 (1.273-2.390) mg/g]. UF showed significant associations with urinary ACR in boys ($r=0.718$, $p<0.0001$) and in girls ($r=0.712$, $p<0.0001$). The participants were normoalbuminuric (ACR≤30 mg/g), and the significant elevation of ACR with increasing fluoride exposure rendered a potential risk of renal injury. Longitudinal studies are recommended to explore these associations in depth.

Keywords: *fluoride, paediatric, kidney injury, biomarkers*