

**A STUDY ON CHRONIC KIDNEY DISEASE OF UNKNOWN
ETIOLOGY IN MEDAWACHCHIYA DIVISIONAL
SECRETARIAT OF NORTH CENTRAL PROVINCE OF
SRI LANKA**

E. A. R. I. E. Siriwardhana

Department of Biochemistry	Board of Study in Biochemistry and
Faculty of Medicine & Allied Sciences	Molecular Biology
Rajarata University of Sri Lanka	Postgraduate Institute of Science
Sri Lanka	University of Peradeniya, Sri Lanka

The increasing incidence of chronic kidney disease (CKD) in the world has become a major health concern. Diabetes mellitus and hypertension have been identified as the most common causes of CKD, both in developed and developing countries. However, unusual forms of CKD, of which the exact cause/s have not been identified as yet, have been reported from certain parts of the world, including Sri Lanka. Much talked of Balken endemic nephropathy, which is reported among the inhabitants along the tributaries of Danube river of Balken region, CKD in Nicaragua affecting sugarcane/banana, fishing and mining communities, and chronic interstitial nephropathy of unknown causes in Tunisia (CINu) are internationally reported scenarios of CKD with unknown etiology (CKDu). In the Sri Lankan context, CKDu has been reported from certain parts of North Central, North Eastern and Uva provinces, with the highest prevalence being reported in the North Central province (NCP). The possible causative factor/s for these unusual forms of CKD in certain countries, including Sri Lanka still remains obscure. The records from the Provincial Director of Health Office, Anuradhapura, reveals that the highest number of cases reported up to date, are from the Medawachchiya divisional secretariat area in the Anuradhapura district.

The objective of the current study was to investigate the possible risk factor/s that may be responsible for the causation of CKDu among CKDu patients who were inhabitants of the Medawachchiya divisional secretariat area. An epidemiological study was carried out by administering a questionnaire, on 100 patients with CKDu, and 100 age and sex matched normal subjects. Univariate analysis of the data obtained, showed that being a farmer, working for more than 6 hrs in the fields, drinking well water, water intake less than 3 L per day and having a past history of malaria to be having greater likelihood towards the development of CKDu, while consumption of treated water and consumption of plain tea to be having significant ($p < 0.05$) protective effects against CKDu. Analysis of the same data using the linear logistic model revealed working for more than 6 hours per day, drinking well water, consumption of less than 3 L of water per day and having a history of malaria to have significant ($p < 0.05$) effect on the development of CKDu.

Dietary pattern of CKDu patients (n = 100) and normal subjects (n = 100) were assessed qualitatively, using 24 hour dietary recalls. More than 90% of tested meals of both CKDu patients and normal subjects, had rice as the staple diet, and consumption of rice was not found to be having likelihood for the development of CKDu. Rice consumption patterns of CKDu patients and normal subjects were similar. Accompaniments other than fruit vegetables were more favorable to healthy living than being a risk factor

Studying the effect of replacement of habitual drinking water with bottled water, on kidney functions of CKDu patients showed that, the progression of the disease among such CKDu patients to decline when compared to CKDu patients who continued to consume water from their habitual sources. Serum aspartate transaminase (AST) and bilirubin levels of CKDu patients of both intervened and non-intervened groups were found to be within normal limits.

Urinary β_2 -microglobulin (β_2m) levels of CKDu patients from Medawchchiya ($1.24 \pm 0.71 \mu\text{g/mL}$) were significantly higher ($p < 0.05$) than that of the normal subjects from Medawchchiya area itself ($0.16 \pm 0.05 \mu\text{g/mL}$), and normal subjects from the CKDu non endemic area, Ja-Ela ($0.17 \pm 0.05 \mu\text{g/mL}$).

The current study identified several factors to be associated with the development of CKDu. Drinking water from their habitual drinking water sources, seem to contribute towards the progression of the disease. The small sample size in the drinking water replacement component of the intervention study, constrains the extrapolation of the results to the entire CKDu population. Liver functions of both groups of CKDu patients (intervened and non intervened) being normal, is suggestive that the probable risk factors to have no hepatotoxic effect. Tubular functions of the normal subjects from Medawachchiya, in terms of urinary β_2m levels appeared to be similar to that of the normal subjects from the CKDu non-endemic area of Ja-Ela. Therefore, normal subjects living in the Medawachchiya area did not seem to be affected though exposed to the same environmental risk factors.