Assessment of Quality of Drinking Water in Selected Areas of Badulla District: An Approach to Causative Factors for Chronic Kidney Disease of Unknown Etiology (CKDu)

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Chronic Kidney Disease of unknown etiology (CKDu) is one of the major health issues in Sri Lanka. Though the main reason for the CKDu has not yet been identified, it is suggested that this is due to multi-factorial effect. However, it strongly correlates with certain drinking water quality parameters. Hence, this study was aimed on evaluating the quality of drinking water sources in CKDu potential areas in Badulla district and compare with the Sri Lanka Standard (SLS) water quality admissible levels. Drinking water samples were collected from dug wells in CKDu potential areas in Uva Province; Lower- *Rathkinda*, *Ginnoruwa*, *Rideemaliyadda* and *Uva Paranagama* (control area). Parameters such as pH, electrical conductivity, anions and heavy metals were analyzed following standard methods. Data were analyzed by one sample T- test, using IBM SPSS statistics 21.0 version. Mean values of pH value, electrical conductivity, chloride levels, nitrate levels and hardness of water samples of all the areas were within the acceptable range for portable water according to the standard SLS 614:2013. Mean fluoride contents and phosphate contents of all potential CKDu areas were less than the stipulated standard levels while *Uva Paranagama* exceeds the standard levels. Cadmium, as one of the most suspected causative heavy metal for CKDu, showed significantly higher level ($P<0.05$) than that of the admissible level of 0.003 mg L^{-1} in Lower- *Rathkinda* (0.005± 0.001 mg L^{-1}) and *Ginnoruwa* (0.006± 0.001 mg L^{-1}). Control area showed a higher Cd level (0.04± 0.002 mg L^{-1}, $P>0.05$) than that of the permissible level whereas *Rideemaliyadda* (0.002± 0.002 mg L^{-1}, $P>0.05$) shows lower levels than the permissible level. Lower- *Rathkinda* and *Ginnoruwa* areas showed higher levels of iron than that of the standard level of 0.3 mg L^{-1}. Due to the high content of Cd levels in all the water samples, the water sources are at a risky status for drinking purpose even though the other parameters showed safe levels.

Keywords: Chronic kidney disease, Badulla, Water quality, Cadmium