



PHYSICO-CHEMICAL AND PATHOGENIC CONTAMINATION STATUS OF GROUNDWATER IN CKDU AFFECTED WILGAMUWA IN MATALE DISTRICT

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ABSTRACT

Chronic Kidney Disease of Unknown aetiology (CKDu) is an emerging disease in Sri Lanka which is prevalence in North Central, Uva and Eastern Provinces. In consequence, Wilgamuwa Divisional Secretariat (WDS) in Matale District was recently identified as the high CKDu prevalence area and WDS is restricted for high number of CKDu cases and, more than 95% of patients are belonging to the farming community. Therefore, the present study was aimed to analyze groundwater quality and microbial contamination of WDS as groundwater is the main drinking water source of the area. During the study period, hundred and thirty-four wells were sampled and the selection was based on distribution and prevalence of the CKDu patients in Grama Niladari Divisions (GND) of the WDS. The sampling was performed from December 2017 to February 2018. Water temperatures, Dissolved Oxygen (DO), pH and conductivity were measured at the site itself using standard meters. Chemical Oxygen Demand (COD) and Total Hardness (TH) were measured using standard colourimetric and titrimetric methods. Fluoride was measured using standard Ion Chromatography (IC) and the total and faecal coliform counts were obtained from the standard membrane filtration method. It was found that 90% of samples were contaminated with total coliform and out of 90%, 69% of samples were positive for faecal coliform. The results of the study showed that the pH of water varied from 5.8 to 8.4 where DO remained between 1.4 to 9.9 mg/L. Water conductivity, COD, Total hardness, and fluoride ranged from 45 to 1170 μ S/cm, 1 to 47 mg/L, 34 to 916 mg/L and 0.02 to 2.97 mg/L respectively. Further it was found that 15% of the tested wells were not within the standard values given for drinking water by the Sri Lankan Standard Institution (SLSI). Accordingly, water quality and CKDu prevalence in Wilgamuwa area shows clear-cut correlation between water hardness and fluoride. Therefore, detailed studies in terms of *in-situ* and *in-vitro* are needed to find a relationship between CKDu and water quality of the affected areas.

Keywords: Groundwater, Wilgamuwa, CKDu, Fluoride, Water quality, microbial contamination