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Assessment of hardness and selected anion contents of well water in Mahadivulwewa and Puhudivula grama niladari divisions in Madawachchiya divisional secretariat area

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Mahadivulwewa and Puhudivula grama niladari (GN) divisions of Madawachchiya divisional secretariat area are highly influenced by agricultural practices. These areas have reported the highest number of CKDu patients. People in these GN divisions have colonized as isolated villages. Therefore, in our study we have selected 10 sites in Mahadivulwewa and Puhudivula representing all villages to analyze the current situation of water quality in those areas. The Calcium, Magnesium, Fluoride, Nitrate, Nitrite, Sulphate, alkalinity, hardness conductivity, salinity and TDS levels were measured according to American Public Health Association (APHA) standards. Results were analyzed using IBM SPSS Statistics 20 software. The Calcium level ranged between 17.30 - 101.35 mg/L and Magnesium level ranged between 4 - 102 mg/L. Fluoride (F⁻), Nitrate (NO₃⁻), Nitrite (NO₂⁻) and Sulphate (SO₄²⁻) levels ranged between 0.02 - 4.3 mg/L, 0 - 8 mg/L, 0.1 - 9.3 mg/L and 4 - 98 mg/L respectively. Alkalinity and hardness levels ranged between 20-250 CaCO₃ (mg/L) and 59.7 - 608.9 CaCO₃ (mg/L) respectively. With respect to Magnesium, Fluoride, hardness and alkalinity, water samples had exceeded SLS recommended levels by 66.7%, 51.7%, 71.2% and 2.6%, respectively. No water sample had exceeded the SLS recommended levels for NO₃⁻, NO₂⁻ and SO₄²⁻. Even though there is no significant difference (P >0.05) with respect to above parameters between the sites, there was a slightly low conductivity levels in one site (with the highest percentage of CKDu patients) compared to the other sites. According to these results higher percentages of wells in these areas are not suitable for drinking purposes.

Keywords: CKDu, fluoride, hardness, Mahadivulwewa, Puhudivula, water quality

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