The Spatial Distribution of Water Quality Correlated to Chronic Kidney Disease of Unknown Etiology in Monaragala District, Sri Lanka

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Chronic Kidney Disease of unknown Etiology (CKDu) is a major public health issue worldwide, affecting most agricultural communities. The first sign of CKDu is increased albumin excretion in the urine. CKDu has been most prevalent in the dry zone in Sri Lanka over the last two decades. Despite the fact that many scientists have proposed various risk factors, the primary cause of CKDu is still unknown. The purpose of this study was to determine the spatial distribution of physiochemical parameters in water in the DS divisions in Monaragala district of Uva Province, Sri Lanka, and interpolate with CKDu. Sixty-six water samples were collected from dug wells and tube wells representing groundwater, reservoirs, rivers, and tanks representing the surface water. pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Alkalinity, Total Hardness, Major Cations (Na, K, Ca, Mg), and Major Anions (Fluoride, Chloride, Nitrate, Phosphate, and Sulfate) were analyzed using standard methods and compared with water quality standards. The spatial distribution of water quality parameters was developed by the Inverse Distance Weighted (IDW) tool, and the CKDu patients' distribution map was also developed in ArcMap 10.8 software. According to the comparison with the water quality standards, total hardness, total alkalinity, fluoride, chloride, nitrate, phosphate, Ca, and Mg were found to be at higher levels than standards. The distribution of CKDu patients in the map was overlapped by the above parameter distributions, which indicates that water quality has a significant impact on CKDu prevalence in the Monaragala district of Sri Lanka.

Keywords: CKDu, GIS, Monaragala, Spatial Distribution