

GEOGRAPHICAL DISTRIBUTION OF CHRONIC KIDNEY DISEASE OF UNKNOWN ORIGIN IN SRI LANKA – IS IT RELATED TO STAGNANT IRRIGATED WATER?

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In early nineties, an alarmingly high incidence of an apparently new form of chronic kidney disease of unknown etiology (CKDu) has been identified in some parts of Sri Lanka. A steady increase of this disease has been observed during the last twenty years. Histopathological studies have revealed a tubulo interstitial nephritis at early stage of the disease, which is suggestive of a toxic aetiology. Similar endemic nephropathy described in Balken region shows a relationship to Danubi river. Aim of the present study is to investigate the geographical distribution of CKDu using modern GPS and GIS based mapping and to relate it to different drinking water sources available in the region.

Information of 11630 patients were collected and used for GIS mapping using AR 9.2 software and GPS mapping. GIS mapping indicated five high prevalent areas in the region, namely Medawachchiya, Padaviya, Girandurukotte, Medirigiriya and Nikawewa (identified 20, 18, 12, 8 and 5 yrs ago). Low prevalence of the disease was noted in communities who consume water from natural springs for drinking. In all five areas, the distribution is related to stagnant irrigated water. GPS mapping shows that most of the cases are located below the level of some canals, reservoirs and some are related to the irrigation canals.

It has been observed that all five regions affected with the CKDu encompass a well developed irrigation system comprising of reservoirs. Water from these reservoirs is mainly used for agricultural purposes. However, the people who live in these areas consume water from shallow wells and water levels of these shallow wells are proportionate to the water levels of the canals indicating that the ground water table is recharged from irrigation canals and reservoirs. It has been observed that the prevalence of the disease is comparatively low in the villages where natural spring water is available for consumption.

Observations of the study reveals that the exposure to the aetiological agent remains unchanged and new disease foci are reported to be emerging. Disease preponderance in males may be due to their frequent exposure to the aetiological agent than females or due to another unknown contributory factor that operates in males which increases the risk of the disease. The reported familial occurrence of the disease with no evidence of clear Mendelian inheritance could be due to exposure of the siblings to the aetiological agent rather than direct genetic/inherited background for the disease.

All the high prevalent areas are clustered around reservoirs of the irrigation system. The epidemiological data on geographical distribution infers that while older foci of CKDu are persisting, there is an emergence of new foci of CKDu with time. The presence of the affected villages located below the level of the reservoirs and canals indicate the possibility of irrigated water draining to the shallow wells of the households which is the source of drinking water.