



EXPOSURE ANALYSIS OF DRINKING AND DIETARY CONTAMINANTS IN A SELECTED POPULATION, PADAVIYA, ANURADHAPURA.

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Water and foods are the main exposure pathways for many of contaminants causing severe health damage in human. This study focused on exposure of selected drinking and dietary contaminants and assess their risk in selected population of Padaviya, Anuradhapura. Thirty families were randomly selected as fifteen with CKD patients and other fifteen families without CKD patients. The questionnaire based social survey was conducted and relevant data were collected for the risk analysis. Water, rice and soil samples in each family were collected. Nitrate-N, total hardness and fluoride are varied within the range as 1.01 - 23.4 mg/L, 40.04 – 644.58 mg/L and 0.47 – 1.92 mg/L and mean values were varied respectively 3.51 ± 5.32 , 161.48 ± 152.05 and 0.73 ± 0.37 . All physiochemical parameters are significantly different between wells ($P < 0.05$). pH, Conductivity and TDS in well water are below of Sri Lankan standard for portable water level (SLPWL: pH- 6.5 - 9.0, Conductivity-750 – 3500 $\mu\text{s}/\text{cm}$, TDS-500 – 2000 mg/L). But in some wells exceed SLPWL of NO₃-N, hardness and fluoride (SLPWL: NO₃-N-10 mg/L, hardness-250-600 mg/L, fluoride-1.5 mg/L). Both iron and copper concentration in well water are lower than the provisional maximum tolerable daily intake (PMTDI) of WHO (Fe: 2 mg/L and Cu: 2 mg/L). Dietary iron and copper concentrations in rice are higher than the PMTDI of WHO (0.5 mg/kg). Copper and Iron are varied within the range of 1.55 – 48.4 mg/kg dw and 467.08-893.61 mg/kgdw in soil. Probable exposure concentration in case group is higher than probable non-exposure concentration in non-case group for all selected contaminants in studied population. Relative Risk is greater than 1 for all selected contaminants (NO₃-N, hardness, fluoride, Copper and Iron) and it explains that there is a risk due to drinking water and eating rice for the selected contaminants. Non - cancer risk values in selected families were higher than 1×10^{-6} . It reveals, in a population of one million people, additional person or persons would be expected to develop risk from relevant contaminants. And also when compare the risk values separately; male group is the most vulnerable for drinking and dietary contamination than other two groups. Since exposure of studied contaminants of drinking water and rice in Padaviya area especially, fluoride, calcium, magnesium and iron content may be risked for human health and Iron rich soil and over use of agrochemicals & fertilizers may induce this problem.

Keywords: *Exposure, Contaminants, drinking, dietary, risk, recommended level*