Trace Metal Contents in Muscle Tissues of Inland Fish Species in the North central Province of Sri Lanka

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ABSTRACT

Chronic Kidney Disease (CKD) has recently shown a remarkable increase in some areas in the North Central Province (Anuradhapura and Polonnaruwa districts), Sri Lanka. The consumption of fresh water fish contaminated with trace metals is considered as a possible causal factor for this. The concentration of mercury (Hg), lead (Pb), cadmium (Cd), chromium (Cr), copper (Cu), cobalt (Co), zinc (Zn), iron (Fe) and arsenic (As) in the muscle tissues of the five commonly consumed freshwater fish species, Oreochromis spp., Heteropneustes fossilis, Glossogobius giuris, Channa striata and Macrognathus aral were determined using Atomic Absorption Spectrophotometry (AAS). This study indicates that toxic metals’ Hg, Cd and Pb were detected in very low concentration in muscle tissues and the recorded values were lower than the maximum permissible level (Hg< 0.5 mg/kg, Pb< 0.2 mg/kg and Cd< 0.05 mg/kg) established in Sri Lanka. The amount of fish that would fulfil the weekly protein requirement of an average child and adult was calculated according to the WHO guidelines. The calculated levels of contamination by Hg, Pb, Cd, As, Cu, Zn, Cr and Fe in the quantity of fish needed to fulfil the protein requirement was lower than the Provisional Tolerable Weekly Intake (PTWI) value established by WHO, EU and FAO and none of above guidelines not covered the level of Co.

Keywords: Chronic Kidney Disease (CKD), contamination, freshwater fish, protein requirement